

ECO4203 Applied Econometrics

Andrea Nayeli Ramírez Becerril

Student ID 4069901

Final Research Project

The Effects of Corruption on Democracy and the Rule of Law:

Is Corruption the Main Factor Undermining the Rule of Law

## **Introduction**

The World Justice Project (WJP) -an independent, multidisciplinary organization- defines rule of law as a durable system of laws, institutions, norms and community commitment that delivers accountability, just law, open government and accessible as well as impartial justice. Transparency International refers to rule of law as *legal and political systems, structures and practices that condition a government's actions to protect citizens' rights and liberties, maintain law and order, and encourage the effective functioning of the country*. Research has demonstrated that rule of law is correlated to higher economic growth, greater peace, more equality, better health outcomes and more education. There is no single universal definition for rule of law and its meaning is frequently discussed by academics, researchers, lawyers, politicians and society itself. In fact, there are multiple and different ways and methodologies -and therefore indices- when it comes to the measurement of rule of law. For example, institutions such as Bertelsmann Foundation, Freedom House, Global Integrity and The Political Risk Services Group have worked on gathering data for constructing indices that reflect the level of rule of law in different countries. Since 1964 there is evidence showing that high levels of corruption are related to a weak rule of law. For example, Mendonça and Fonseca (2012) showed that a strong adherence to the rule of law contributes to lower levels of corruption in both developed and developing countries. Transparency International defines corruption as *the abuse of entrusted power for private gain. It erodes trust, weakens democracy, hampers economic development and further exacerbates inequality, poverty, social division and the environmental crisis*. Corruption materialized through behaviors like bribery, nepotism and the misuse of public resources.. As of 2021 around 70% of the world's population lived in non-democratic countries or backsliding-democracies, meaning that democratic institutions are being eroded and leading to more authoritarian regimes (Camacho, 2022).

## **Background**

An increase in corruption usually leads to the erosion and deterioration of democracy since many of its institutions, as well as its rules and norms get undermined. When talking about democracy we have to consider a multidimensional definition of it. Many studies regarding democracy focus mainly on examining the effects of democracy on economic growth and find no direct impact. In fact, these show that democracy impacts only indirectly economic growth. Intuitively, one might think and accept the belief that democracy has a direct impact on economic growth due to the positive effects on expenditure on education, life expectancy or political stability. As Cooper et al. (2006) show in their research, corruption has no

significant effect on economic growth in democracies, while non-democracies suffer significant economic harm from corruption. Cooper et al. attribute this to the ability of democracy to mitigate the pernicious effects of corruption on economic growth. These findings suggest that the relationship between democracy and variables such as corruption and economic growth is in fact more complex.

As previously mentioned, there is no single unique definition for democracy. Some academics refer to it as “a system of governance in which rulers are held accountable for their actions in the public realm by citizens, acting indirectly through the competition and cooperation of their elected representatives” (Schmitter and Karl, 1991). One can think of this and other similar definitions as “electoral democracy definitions” (Drapalova, 2019). As for other researchers and academics (Morlino 2004; Ercan and Gagnon 2014;), they democracy goes beyond electoral aspects and include other dimensions into the definition of democracy such as rule of law, freedom, equality, respect for independent institutions as well as for human rights, responsiveness and checks and balances. As mentioned before, corruption refers to the abuse of public office for private gain and its relationship with democracy is also complex. While some democratic countries show surprisingly high levels of corruption, other non-democratic countries show a decrease in corruption levels (Drapalova, 2019). In addition to this, literature on the matter presents two different points of view. On the one hand, some academics and researchers consider corruption to have negative effects on democracy and economic growth since it misallocates resources. On the other hand, a not very accepted position, others consider corruption might be economically beneficial because it favors the most efficient firms, which could boost and enhance the economic activity (Cooper et al., 2006). According to the International Monetary Fund, the cost of bribery is around \$1.5 to \$2 trillion USD. The Transparency International Corruption Perceptions Index (CPI) scores 178 countries on their level of corruption, being 10 the lowest corruption score and 0 the highest corruption score. In 2010, around 75% of these countries were ranked lower than five.

### **Research Question**

As mentioned several times, the relationship between democracy, rule of law and corruption is in fact complex. Although there is evidence showing that countries under democratic regimes and a solid rule of law also have high levels of corruption, there is also evidence suggesting non-democratic countries with weak rule of law have low levels of corruption. These results make the impact of corruption on rule of law unclear, leading us to raise the question of what is the actual effect of corruption on the rule of law. More specifically, we

want to test whether corruption has in fact a negative impact on rule of law. Following hypotheses are proposed.

- H0: Corruption has a positive impact on the rule of law.
- H1: Corruption has a negative impact on the rule of law.

### **Relevance**

It is important to understand the relationship between democracy, corruption and rule of law since these are concepts that feedback on each other and as mentioned before are also correlated with one another. By identifying and analyzing the main components of rule of law and its impact we can have a broader understanding of how rule of law can be strengthened and improved by policy makers and also have a clearer idea of the actual impact of corruption on rule of law. Furthermore, by unpacking the individual components of corruption, we can also have a better insight on whether the existing methodologies and factors taken into account for its measurement are the best or can be improved. Corruption is still a prevalent issue in the world and as previously mentioned previously there has been a decrease and a backslide on democracy in the world.

### **Methodology**

The World Justice Project Rule of Law Index is the leading source for original data on rule of law. Its findings have been cited by heads of state, chief justices, business leaders and public officials (World Justice Project, 2022). For its measurement, the WJP Rule of Law Index considers 44 indicators across 8 different categories: i) constraints on government powers, ii) absence of corruption, iii) open government, iv) fundamental rights, v) order and security, vi) regulatory enforcement, vii) civil justice and viii) criminal justice. The Index ranges from 0 to 1, being 1 the strongest adherence to rule of law.

The first factor “constraints on government powers” measures the extent to which rulers are bound by law, limited and held accountable under the law. It also considers non-governmental checks on government’s power such as free and independent press.

The factor “absence of corruption” measures the absence of corruption in government and considers bribery, improper influence by public or private interests, and misuse of public resources as forms of corruption. “Open government” measures openness of government in terms of shared information and its quality and public participation in public policy deliberations. “Fundamental rights” measures the extent to which the system of law adheres to human rights established under the United Nations Universal Declaration of Human Rights. “Order and security” measures the extent to which security of persons and property is ensured. “Regulatory enforcement” measures the extent to which legal and administrative

regulations are fairly and effectively implemented and enforced. “Civil justice” measures whether all individuals can resolve their grievances through an impartial, effective civil justice system as well as if it is free of corruption and discrimination. The last factor “criminal justice” evaluates a country’s criminal justice system as a mechanism to redress grievances and prosecute offenders.

In order to assess the impact of each of these factors on the rule of law we propose to develop a suitable regression model that considers the individual score of each factor. For this we will use data from 140 countries from the WJP 2022 edition. It is important to mention that since scores range from 0 to 1 we will multiply each score times 100 in order to ease any scale problem and small numbers.

The model will consider the rule of law index overall score as the dependent variable and the previously mentioned factors as the independent variables. The proposed theoretical regression model is as follows:

$$RL\_Score = \beta_0 + \beta_1 Factor1 + \beta_2 Factor2 + \beta_3 Factor3 + \beta_4 Factor4 + \beta_5 Factor5 + \beta_6 Factor6 + \beta_7 Factor7 + \beta_8 Factor8 + u_i$$

Where:

RL\_Score = Rule of Law Index Overall Score 2022

Factor 1 = Constraints on government powers

Factor 2 = Absence of corruption

Factor 3 = Open government

Factor 4 = Fundamental rights

Factor 5 = Order and security

Factor 6 = Regulatory enforcement

Factor 7 = Civil justice

Factor 8 = Criminal justice

## **Analysis and Results**

After running the data on RStudio we obtain the following results.

Figure 1. Estimated coefficients for the model.

```
Call:
lm(formula = score ~ factor1 + factor2 + factor3 + factor4 +
    factor5 + factor6 + factor7 + factor8, data = WJP_2022)

Residuals:
    Min       1Q   Median       3Q      Max
-9.217e-14 -2.911e-15  2.700e-16  4.972e-15  4.972e-14

Coefficients:
              Estimate Std. Error  t value Pr(>|t|)
(Intercept) -7.206e-15  7.376e-15  -9.770e-01    0.33
factor1      1.250e-01  2.141e-16  5.839e+14 <2e-16 ***
factor2      1.250e-01  1.802e-16  6.936e+14 <2e-16 ***
factor3      1.250e-01  1.865e-16  6.703e+14 <2e-16 ***
factor4      1.250e-01  1.785e-16  7.004e+14 <2e-16 ***
factor5      1.250e-01  1.334e-16  9.371e+14 <2e-16 ***
factor6      1.250e-01  2.564e-16  4.876e+14 <2e-16 ***
factor7      1.250e-01  2.403e-16  5.202e+14 <2e-16 ***
factor8      1.250e-01  2.401e-16  5.206e+14 <2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 1.138e-14 on 131 degrees of freedom
Multiple R-squared: 1, Adjusted R-squared: 1
F-statistic: 2.809e+31 on 8 and 131 DF, p-value: < 2.2e-16
```

It is important to mention that all coefficients except for the intercept are statistically significant at a level of significance of 0.05. As for the goodness of fit, the adjusted R-squared is equal to 1 which means that 100% of the Index's variability can be explained through the included independent variables. The estimated coefficient for all variables in the linear model have a value of 0.125 which means that, holding all other variables constant, if factor x increases by a unit, the overall index score on average increases by about 0.125 units. Remember that the Rule of Law Index scores vary from 0 to 1, being 0 the weakest adherence to rule of law and 1 the strongest adherence to rule of law. A priori, one would expect that as corruption increases, rule of law weakens. However, since factor 2 and its scores on corruption don't measure corruption itself but absence of corruption, the coefficient will likely be positive, meaning a higher absence of corruption will strengthen the rule of law. The result of the coefficient came out positive, which stands in line with our expectations. Note that since factor 2 does not measure corruption itself but absence of corruption, the estimated coefficient turned out positive, meaning a higher absence of corruption in fact strengthens the rule of law. Therefore, in order to statistically assess whether factor 2

-absence of corruption- has in fact a positive impact on the rule of law score we perform following hypothesis test:

Significance level at 0.05

$H_0: \beta_2 \leq 0$

$H_1: \beta_2 > 0$

Since our alternative hypothesis  $H_1$  has a ">" greater than symbol, we know we have to perform a right-tail test (upper-test). In RStudio we can run the right-tailed hypothesis test with the `pt()` function by using the t-statistic for the factor 2 estimated coefficient and the degrees of freedom.

```
> pt(6.936e+14, 131, lower.tail = FALSE)
[1] 0
```

Since the associated p-value is lower than 0.05 we can reject  $H_0$  and conclude that factor 2 has a positive impact on the rule of law overall score. This means that in fact, less corruption leads to a higher score on adherence to rule of law, suggesting that lower levels of corruption also strengthen the rule of law.

It is important to highlight that the  $R^2$  is equal to 1, which suggests a perfect fit between the data and the model. In addition to this, the F-tests shows that the model overall is statistically significant. Although all independent variables are statistically significant, we can suspect from multicollinearity. There are different ways to check for collinearity among the regressors. For this we can compute the correlation matrix to see the association degree between the different variables.

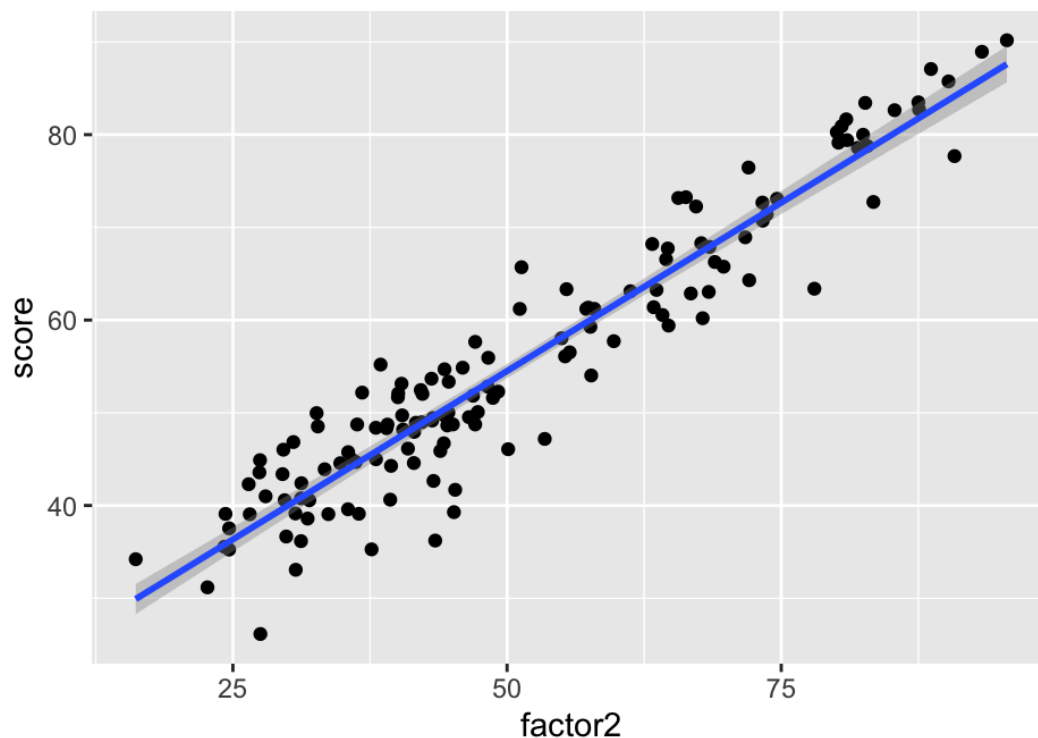
Figure 2. Correlation matrix

```
> cor(WJP_2022)
      score factor1 factor2 factor3 factor4 factor5 factor6 factor7 factor8
score  1.000000 0.9358278 0.9490249 0.9031598 0.9261869 0.7859950 0.9686921 0.9523239 0.9609713
factor1 0.9358278 1.0000000 0.8358537 0.9071477 0.9223285 0.5887153 0.8976756 0.8583952 0.8725319
factor2 0.9490249 0.8358537 1.0000000 0.7853774 0.8070481 0.7686382 0.9278102 0.9272302 0.9444578
factor3 0.9031598 0.9071477 0.7853774 1.0000000 0.8995266 0.6008123 0.8739895 0.7971928 0.7907414
factor4 0.9261869 0.9223285 0.8070481 0.8995266 1.0000000 0.6513574 0.8581433 0.8376910 0.8482784
factor5 0.7859950 0.5887153 0.7686382 0.6008123 0.6513574 1.0000000 0.7322017 0.7540008 0.7755393
factor6 0.9686921 0.8976756 0.9278102 0.8739895 0.8581433 0.7322017 1.0000000 0.9329171 0.9274810
factor7 0.9523239 0.8583952 0.9272302 0.7971928 0.8376910 0.7540008 0.9329171 1.0000000 0.9336723
factor8 0.9609713 0.8725319 0.9444578 0.7907414 0.8482784 0.7755393 0.9274810 0.9336723 1.0000000
```

As Figure 2 shows, the most correlated factor with the overall index score is factor 6 (regulatory enforcement), followed by factor 8, factor 7 and factor 2. Moreover, by plotting the rule of law index score against factor 2 we can see that the variables have a positive

association. In other words, as factor 2 (absence of corruption) increases, so does the score on rule of law, meaning that the lower corruption is, the stronger rule of law gets.

Figure 3. Scatterplot index score vs factor 2



We can also estimate in RStudio the Variance Inflating Factor VIF, which measures the degree to which the variance of the Ordinary Least Squares estimators are inflated because of collinearity.

```
> vif(m1)
factor1 factor2 factor3 factor4 factor5 factor6 factor7
13.243097 12.457133 8.806334 9.274792 3.214367 16.193673 11.427096
factor8
16.154142
```

By looking at the VIF, we can easily see that the independent variables are highly correlated. To solve this, we can run 8 auxiliary regressions in order to decide which independent variable to drop.



```

aux1 <- lm(factor1 ~ factor2+factor3+factor4+factor5+factor6+factor7+factor8, data=WJP_2022)
aux2 <- lm(factor2 ~ factor1+factor3+factor4+factor5+factor6+factor7+factor8, data=WJP_2022)
aux3 <- lm(factor3 ~ factor2+factor1+factor4+factor5+factor6+factor7+factor8, data=WJP_2022)
aux4 <- lm(factor4 ~ factor2+factor3+factor1+factor5+factor6+factor7+factor8, data=WJP_2022)
aux5 <- lm(factor5 ~ factor2+factor3+factor4+factor1+factor6+factor7+factor8, data=WJP_2022)
aux6 <- lm(factor6 ~ factor2+factor3+factor4+factor5+factor1+factor7+factor8, data=WJP_2022)
aux7 <- lm(factor7 ~ factor2+factor3+factor4+factor5+factor6+factor1+factor8, data=WJP_2022)
aux8 <- lm(factor8 ~ factor2+factor3+factor4+factor5+factor6+factor7+factor1, data=WJP_2022)
summary(aux1)
summary(aux2)
summary(aux3)
summary(aux4)
summary(aux5)
summary(aux6)
summary(aux7)
summary(aux8)

```

The independent variables with highest adjusted R<sup>2</sup> values are factor6 (R<sup>2</sup>=0.935), factor8 (R<sup>2</sup>=0.9348) and factor1 (R<sup>2</sup>=0.9205). Dropping either of these variables might be a good choice. Nevertheless, according to Klein's rule of thumb, as long as all the R<sup>2</sup> obtained in the auxiliary regressions are not larger than the initial R<sup>2</sup>, multicollinearity will not be a troublesome issue.

## Conclusions

We can conclude from our hypothesis test that in fact, lower levels of corruption will strengthen the score on rule of law. Therefore, our research provides additional evidence and support to the traditional argument that corruption hampers rule of law and overall has a negative effect on it. Although our results do not deviate that much from past research and results, it is important to mention that our analysis and results can have some limitations since our research is limited to analyzing an index and its components and the relationship between these. In order to perform deeper analysis and have a broader understanding of the impact of corruption on the rule of law, we suggest performing an analysis by country and its development levels. In other words, to conduct an analysis which separates developed countries from developing countries. By doing so, we can better understand the impact of corruption on the rule of law depending on the country. Furthermore, policy makers can design and develop different strategies to control corruption and strengthen the rule of law depending on the country.

## References

- Camacho, G. (2022) The connections between corruption, autocracy and human rights in Latin America. Transparency International. <https://knowledgehub.transparency.org/helpdesk/the-connections-between-corruption-autocracy-and-human-rights-in-latin-america>
- Cooper et al. (2006) Corruption, Democracy and Economic Growth. International Political Science Review. Vol 27, No. 2, 121–136. <https://0-journals-sagepub-com.biblioteca-ils.tec.mx/doi/abs/10.1177/0192512106061423>
- Drapalova, E. (2019) Corruption and the crisis of democracy. Transparency International. <https://knowledgehub.transparency.org/helpdesk/corruption-and-the-crisis-of-democracy>
- Ercan, Selen A., and Jean-Paul Gagnon. 2014. “The Crisis of Democracy: Which Crisis? Which Democracy?” Democratic Theory 1 (2): 1–10. <https://doi.org/10.3167/dt.2014.010201>.
- Mendonça, H. & Fonseca, A. (2012). Corruption, income, and rule of law: empirical evidence from developing and developed economies. *Revista de Economía Política*, 32(2), 305-314. <https://doi.org/10.1590/s0101-31572012000200009>
- Morlino, Leonardo. 2004. “What Is a ‘Good’ Democracy?” Democratization 11 (5): 10–32. <https://doi.org/10.1080/13510340412331304589>
- Morris, Stephen D.. (2021). Corruption, Rule of Law and Democracy: Concepts, Boundaries and Oxymora. *Mexican law review*, 13(2), 153-174. Epub 06 de diciembre de 2021. <https://doi.org/10.22201/ijj.24485306e.2021.2.15338>
- Schmitter, Philippe C., and Terry Lynn Karl. 1991. “What Democracy Is. . . and Is Not.” *Journal of Democracy* 2 (3): 75–88. <https://doi.org/10.1353/jod.1991.0033>.
- Skaaning, S.-E. (2010). Measuring the Rule of Law. *Political Research Quarterly*, 63(2), 449–460. <http://www.jstor.org/stable/20721503>
- Transparency International (n.d.) What is Corruption? <https://www.transparency.org/en/corruptionary/rule-of-law>
- Tanzi, V. (1998) Corruption around the world: causes, consequences, scope and curses. International Monetary Fund.

<https://www.imf.org/en/Publications/WP/Issues/2016/12/30/Corruption-Around-the-World-Causes-Consequences-Scope-and-Cures-2583>

- World Justice Project (n.d.) What is the Rule of law?  
<https://worldjusticeproject.org/rule-of-law-index/factors/2022/Constraints%20on%20Government%20Powers>