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# POLS 418; Quantitative Methods

Problem Set 3

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***Part 1: Variables and Research Design***

**Democratic Peace**

*Democracies do not go to war with other democracies. Democratic political institutions increase “transparency,” making it easier for other governments to understand public debate and motives in a state’s foreign policy decision-making. This helps democratic states avoid the mistake of assuming international hostility where in fact none exists. By contrast, dictatorships lack the necessary transparency that allows other governments to trust their foreign policy. Although democracies are just as likely to go to war with dictatorships, they do not go to war with other democratic states.*

1. **Identify the dependent and independent variables.**

Figure 1. Democratic Peace Theory Variables

|  |  |
| --- | --- |
| Independent variable | Dependent variable |
|  |  |
| Democracy (+) | Likelihood of war (-) |

1. **Identify the direction of effect (positive or negative).**

The direction is negative. If a pair of states is democratic, the potential for war decreases.

1. **Suggest a rival hypothesis:**

Democratic peace theory claims that there is a causal relationship between democracy and conflict among pairs of democracies.[[1]](#footnote-0) The term “democratic peace” generally refers to the period of peace among democracies since the end of World War II.[[2]](#footnote-1) The theory has two basic arguments: First, democracies “are unlikely” to go to war with each other. Second, democracies are “as prone to conflict with nondemocracies.”[[3]](#footnote-2) Douglas Gibler’s territorial peace theory is a rival hypothesis to the democratic peace theory. His theory claims that states resolve most of their significant foreign policy issues before they become democratic. The peace that follows the resolution of international disputes is a highly favorable condition for the emergence of democracy.[[4]](#footnote-3) Any remaining foreign policy issues for a given democratic state are of relatively minor consequence compared to those of a state’s “undemocratic past.”[[5]](#footnote-4) Ultimately, Gibler’s theory claims that peace causes democracy.

Another rival hypothesis to the democratic peace theory is the “imperial peace theory.” The imperial peace theory is considered a realist theory because it attributes the peace among democracies in the post-World War II era to the balance of power.[[6]](#footnote-5) Specifically, the imperial peace theory claims that the cause of the peace was the United States’ dominance in the western hemisphere and in western Europe after World War II.[[7]](#footnote-6) Realist theory argues that a state’s ultimate aim is to dominate its region and prevent other states from dominating their region in other parts of the world.[[8]](#footnote-7) When World War II ended, the US already dominated the western hemisphere,but it sought to prevent the rising Soviet Union from dominating Europe.[[9]](#footnote-8) The US accomplished this by establishing a democratic sphere of influence in western Europe. The countries of western Europe were also economically and militarily weak after World War II. Western Europe’s collective fear of a Soviet invasion and its inability to defend itself provided the US with additional leverage to shape the region’s democratic and peaceful future.[[10]](#footnote-9)

1. **Identify intervening variables, if any.**

The transparency of democratic institutions is an intervening variable.[[11]](#footnote-10)

Democracy (IV)(+)🡪 transparency(intervening)(+)🡪likelihood of war (DV) (-)

1. **Reformulate the explanation as a proper-form hypothesis.**

In a comparison of country pairs, democracy pairs are less likely than non-democracy pairs to go to war with each other.

**Gun Control Gridlock**

*Gun control legislation regularly fails in Congress because of the structure of interest groups. The National Rifle Association is a well-organized lobby, while gun control advocates are markedly less organized. Because the costs of gun control fall disproportionately on a few gun owners, they are highly motivated and well organized. The benefits of gun control, by contrast, are spread widely among all citizens; this makes it relatively harder for them to get organized in favor of gun control legislation. Consequently, the National Rifle Association is a well-organized lobby, while the gun control advocates are only loosely organized. For this reason, Congress regularly votes against gun control legislation.*

1. **Identify the dependent and independent variables**

Figure 2. Interest Group Theory Variables

|  |  |
| --- | --- |
| Independent variable | Dependent variable |
|  |  |
| Structure of interest groups (+) | (+) influence of legislative outcome |

1. **Identify the direction of effect (positive or negative)**

The direction is positive, as a group becomes better organized, its influence on a given legislative outcome increases

1. **Suggest a rival hypothesis**

Congress has not passed meaningful gun control regulations since the 1994 assault rifle ban.[[12]](#footnote-11) One theory argues that the failure of gun control legislation is due to the structure of interest groups. In a pluralistic society, special interest groups seek to influence legislative outcomes favorable to the organization’s core values but not necessarily favorable to a majority of citizens. According to this theory, the structure of interest groups enables the NRA to spend money on lobbying and donations, which incentivizes politicians to subvert the preferences of a majority of Americans who support meaningful gun control reform, while distributed or less self-aware political groups such as gun control advocates are less successful.

A rival hypothesis views the structure of the electoral college as the deep cause of the failure of congress to pass otherwise popular legislative proposals, with the structure of interest groups operating as an intervening variable. In a comparison of democracies, popular policies are more likely to fail in countries with an electoral college than those with “majority” or “minimum plurality requirements.”[[13]](#footnote-12) With respect to gun control, the structure of the electoral college exerts more influence on the failure of reform legislation. One way to test this claim is for a rival organization of the NRA to match or exceed NRA spending. In 2014 an organization called “Everytown for Gun Safety” matched NRA funding and yet Congress has still not passed meaningful gun control legislation.[[14]](#footnote-13) The alternative hypothesis claims that the NRA’s real power is inextricably linked to “its ability to mobilize and excite huge numbers of voters” who reside in strategically important regions of the country—not its spending capabilities.[[15]](#footnote-14) The structure of the electoral college confers considerable political leverage to areas where support for gun rights is strong.[[16]](#footnote-15)

1. **Identify intervening variables, if any:**

None

1. **Reformulate the explanation as a proper-form hypothesis.**

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In a comparison of political groups, well-organized groups are more likely than distributed groups to influence legislative outcomes.

***Part 2***: ***Variable Coding and Summary Statistics***

The second portion of this assignment requires you to analyze some data in STATA. The dataset contains information from the NCAA about athletic department spending. There are five columns in the data. The first two contain the school’s name and conference. The third column contains each department’s total revenue in millions of dollars (which comes from ticket sales, merchandise, TV contracts, college funding, etc.). The fourth column contains each department’s total expenditures. The fifth column contains each department’s revenue from subsidies. This is funding that the department does not raise through ticket sales, TV contracts etc., but rather comes from the university. These funds are typically raised through student fees but can come from a variety of sources.

1. Rename the variables TotalRevenue and TotalExpenditues Revenue and Expenditures.
2. Generate a new variable named ‘SubsidyPct’ that equals total Subsidy divided by Revenue. This variable will represent the proportion of each dept’s revenue that comes from subsidies.
3. Replace the values of SubsidyPct equal to SubsidyPct\*100 to transform the proportions to percentages.
4. Select Statistics>Summaries, tables, and tests>Summary and descriptive statistics>Summary statistics from the dropdown menu. Calculate the mean, median, standard deviation, minimum value, and maximum value for the following variables: Revenue, Expenditures, and Subsidy %. Create a table to display this information and include it in your written assignment.

Figure 3. Summary, Revenue, Expenditures, and Subsidy %

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Variable | Obs | Mean | Std. Dev. | Min | Max | Median |
|  |  |  |  |  |  |  |
| Revenue | 230 | 45.15 | 44.92 | 3.29 | 214.83 | 27.22 |
| Expenditures | 230 | 43.46 | 41.45 | 4.33 | 207.02 | 26.55 |
| Subsidy % | 230 | 51.68 | 28.75 | 0 | 87.97 | 63.24 |

Table 1: Summary Statistics for Division I Athletic Depts. Spending and Revenue

1. Identify what 3 athletic departments raise the most revenue. Identify what three schools raise the least.

Figure 4. Top 3 Schools in Revenue

|  |  |  |
| --- | --- | --- |
| School |  |  |
|  |  |  |
| Ohio State | Big Ten | 185.41 |
| Texas A&M | SEC | 211.96 |
| Texas | Big 12 | 214.83 |

Figure 5. Bottom 3 Schools in Revenue

|  |  |  |
| --- | --- | --- |
| School |  |  |
|  |  |  |
| Alabama A&M | SWAC | 3.29 |
| Coppin State | MEAC | 3.45 |
| Mississippi Valley State | SWAC | 4.33 |

1. Describe how each variable is measured (nominal, ordinal, interval/ratio). Indicate to readers the best measure of each variable’s central tendency

Figure 6. Variable Measurements

|  |  |
| --- | --- |
| Variable | Level of Measurement |
|  |  |
| Revenue | Ratio |
| Expenditure | Ratio |
| Subsidy % | Ratio |

For ratio level variables, it is best to use the mean, as long as the data reflect a normal distribution. If the data are skewed, it is best to use the median. Because the data are skewed and all variables are ratio, the best measure of central tendency for this analysis is the median.

1. Generate a variable called Power5 and set it equal to zero
2. Replace Power5 equal to one if the school is in one of the five conferences “Pac-12, SEC, Big Ten, Big 12, ACC”
3. Select Statistics>Summaries, tables, and tests>Summary and descriptive statistics>Summary statistics from the dropdown menu. Calculate the mean, median, standard deviation, minimum value, and maximum value for the following variables for when Power5 equals “0”: Revenue, Expenditures, and SubsidyPct. Then do the same thing for when Power5 equals “1”. Create a table

containing both sets of results and include it in your written assignment.

Table 7. Summary statistics, non-power five

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Variable | Obs | Mean | Std. Dev. | Min | Max | Median |
|  |  |  |  |  |  |  |
| Revenue | 178 | 23.48 | 13.33 | 3.29 | 83.37 | 19.42 |
| Expenditures | 178 | 23.17 | 13.03 | 4.33 | 83.12 | 19.00 |
| SubsidyPct | 178 | 65.39 | 14.90 | 10.40 | 87.97 | 68.46 |

Table 8. Summary statistics, power five schools

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Variable | Obs | Mean | Std. Dev. | Min | Max | Median |
|  |  |  |  |  |  |  |
| Revenue | 52 | 119.34 | 34.56 | 64.29 | 214.83 | 111.58 |
| Expenditures | 52 | 112.93 | 27.69 | 71.80 | 207.02 | 107.92 |
| SubsidyPct | 52 | 4.77 | 6.51 | 0 | 34.15 | 2.39 |

1. Summarize the results of your table. Are the economics of college athletics different at power 5 schools versus non-power 5 schools?

**Introduction**

The power five conferences refer to the ACC, Big Ten, Big 12, Pac-12, and the SEC. An analysis of 230 public NCAA division I schools shows a stark contrast in the economics of college athletics between power five and non-power five schools. Power five schools subsidize their college athletic departments at considerably lower rates compared to non-power five schools.

**The Economics of College Athletics**

NCAA division I athletics—particularly football and basketball—generate billions in revenue each year.[[17]](#footnote-16) College sports programs are non-profit.[[18]](#footnote-17) For this reason, the money that a college reinvests in its athletic programs roughly matches its revenue. There is a wide disparity in the sources of revenue among division I athletic programs. One notable difference in terms of revenue sources is the reliance on student fees. Most state laws prevent tuition from funding college athletics.[[19]](#footnote-18) Student fees, however, are an important source of revenue for many colleges.

In an analysis of the revenue, expenditure, and subsidies of 230 public NCAA division I schools, the meaningful difference was the variation in subsidies. In this analysis a subsidy is defined as the percentage of athletic department expenditures derived from student fees. A comparison of the status of a school’s conference—power five or non-power five—shows that non-power five schools subsidize their athletic programs at considerably higher rates compared to power five schools.

**Causal Link**

Out of 230 Division I public schools, roughly a fifth—22%—are in a power five conference. And yet the combined revenue of power five schools accounts for over 60% of the total revenue of 230 Division I colleges. The national acclaim of these athletic programs allows power five schools to forgo student fees as a source of revenue, which explains why they have substantially lower rates of subsidies compared to non-power five schools who lack the market size to fund football and basketball programs without student fees.

1. What percentage of ODU’s athletic department’s spending comes from subsidies? Where does ODU rank in terms overall subsidy percentage?

62 % of ODU’s athletic department spending is derived from subsidies. Out of 230 colleges, ODU ranks 108th. ODU’s subsidy rate falls below the mean and median for non-power five schools.

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9. Ibid 323 [↑](#footnote-ref-8)
10. Rosato, Sebastian. "The flawed logic of democratic peace theory." *American political science review*: 599 [↑](#footnote-ref-9)
11. Shared democratic norms may also be an intervening variable. See Reiter, Dan. *Democratic peace theory*. Oxford University Press, 2012. Democracy (IV)(+) 🡪shared values (intervening)(+)🡪likelihood of war(DV)(-) [↑](#footnote-ref-10)
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