# Jeff Davis

Problem Set 1

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# POLS 418: Quantitative Methods

Dr. Zingher

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**Introduction**

The purpose of this analysis is to provide a basic description and commentary on the World Data Indicators (WDI) report for the year 2015.

**I. Data Description**

The table below shows the median, mean, minimum, and maximum for each dataset variable.

Figure 1. Median-Mean-Min-Max-Values[[1]](#footnote-1)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variable** | **Median** | **Mean** | **Min** | **Max** |
| pct\_women\_in\_parliament | 20.00 | 21.69 | 0.00 | 63.80 |
| trade\_pct\_gdp | 74.58 | 88.06 | 19.10 | 419.53 |
| control\_of\_corruption | 1.36 | 1.62 | 0.00 | 4.04 |
| political\_stability | 2.77 | 2.74 | 0.00 | 4.50 |
| population | 10,500,000.00 | 43,564,861.27 | 532,913.00 | 1,370,000,000.00 |
| infant\_mortality | 17.45 | 25.41 | 1.50 | 96.00 |
| fdi\_inflows | 2.48 | 5.22 | -4.70 | 71.71 |
| mil\_exp\_pct\_gdp | 1.49 | 2.09 | 0.00 | 14.38 |
| hiv\_prevalence | 0.40 | 2.10 | 0.10 | 27.50 |
| proportion\_girls\_ed | 49.95 | 49.55 | 39.46 | 52.81 |
| n\_disasters | 1.00 | 2.25 | 0.00 | 36.00 |

**II. Missing Observations**[[2]](#footnote-2)

Some values in the report are missing. Macao and Hong Kong are missing several observations. As subnational units, the missing observations may already be accounted for in China’s observations.[[3]](#footnote-3),[[4]](#footnote-4) Disputed territories are also plausible explanations for missing observations. For example, “Kosovo” and “West Bank and Gaza” have missing data but these territories are disputed, and the governments may have limited statistical capacity.[[5]](#footnote-5) Finally, unique circumstances varying from country to country may explain missing observations. For example, Costa Rica has a missing value for military expenditure, perhaps because it does not have a standing military. Additionally, some countries are not members of the World Bank such as Cuba and North Korea.[[6]](#footnote-6)

**III. Relationships**

*“Political stability” and “natural disasters”*

The ability of a government to execute a coordinated response to a natural shock determines the extent of the disaster. This is in some way related to the level stability within the country’s political system. [[7]](#footnote-7) When political stability is high, the scores on natural disasters tended to be low in the 2015 WDI report.

*“Percentage of women in parliament” and “infant mortality”*

The data in the WDI 2015 shows a negative correlation between the “percentage of women in parliament” and “infant mortality”; when the percentage of women in parliament is high, the infant mortality tends to be lower. [[8]](#footnote-8),[[9]](#footnote-9)

**IV. Outliers**

US, China, and India scored substantially higher than the mean value for natural disasters. But not all countries are equally vulnerable to natural disasters.[[10]](#footnote-10) These countries are geographically large with long coastlines, which may explain the high scores for natural disasters. “Trade % of GDP” also reported high values. The outliers tended to be small population-high productivity countries.[[11]](#footnote-11) When comparing the variable “trade % GDP” with “population” there is a strong negative correlation.[[12]](#footnote-12)

**V. HIV rates**

The 2015 WDI report shows that HIV in Africa is more prevalent. One explanation for this is related to the nature of polygamous relationships in the region. Although rates of sexual promiscuity in Africa are not particularly high, polygamous relationships often occurr with two or more partners simultaneously. Under conditions of repeated exposure to HIV, the chances of “contracting” the virus increase precipitously. This is the basic theory that attempts to explain why rates of HIV are particularly higher in African.[[13]](#footnote-13)

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Appendix A

Figure 2. STATA code and output for linear regression between indepdent variable “political stability” and dependent variable “natural disasters”: regress n\_disasters political\_stability

|  |  |
| --- | --- |
| **Number of observations** | 168 |
| **F (1, 166)** | 3.67 |
| **Prob > F** | 0.06 |
| **R-squared** | 0.02 |
| **Adjusted R-squared** | 0.02 |
| **Root MSE** | 4.33 |

Figure 3. STATA code and output for linear regression between independent variable “population” and dependent variable “trade % GDP”: regress trade\_pct\_gdp population

|  |  |
| --- | --- |
| **Number of observations** | 158 |
| **F (1, 166)** | 5.81 |
| **Prob > F** | 0.02 |
| **R-squared** | 0.04 |
| **Adjusted R-squared** | 0.03 |
| **Root MSE** | 54.84 |

Figure 4. STATA code and output for linear regression between independent variable “pct of women in parliament” and dependent variable “infant mortality”: infant\_mortality pct\_women\_in\_parliament

|  |  |
| --- | --- |
| **Number of observations** | 160 |
| **F (1, 166)** | 2.85 |
| **Prob > F** | 0.09 |
| **R-squared** | 0.02 |
| **Adjusted R-squared** | 0.01 |
| **Root MSE** | 22.67 |

1. From World Data Indicators, 2015 [↑](#footnote-ref-1)
2. The World Bank relies on a variety of sources to populate its development indicator database. National governments play an important role in this process. Official statistics of national governments primarily first “serve” a state-level bureaucratic function that is subject to local circumstances of the country and region. See “Sources and Methods.” *The World Bank*. <http://datatopics.worldbank.org/world-development-indicators/sources-and-methods.html> and “2015 Study on Firearms,” *United Nations Office on Drugs and Crime.* <https://www.unodc.org/documents/firearms-protocol/UNODC_Study_on_Firearms_WEB.pdf> [↑](#footnote-ref-2)
3. Especially “infant mortality” and “military expenditure.” [↑](#footnote-ref-3)
4. Naturally many of the economic indicators *are* available for Macao and Hong Kong because both are Special Administrative regions with a high degree of economic autonomy from the Chinese central government. See Hayes, Adam. “Special Administrative Region (SAR).” *Investopedia.* <https://www.investopedia.com/terms/s/special-administrative-region.asp> [↑](#footnote-ref-4)
5. Regional and local conflicts can also undermine statistical gathering efforts. Many countries that are designated as conflict zones have missing observations in the 2015 WDI report. See “Why are some data not available.” *The World Bank.* <https://datahelpdesk.worldbank.org/knowledgebase/articles/191133-why-are-some-data-not-available> [↑](#footnote-ref-5)
6. Cuba withdrew its membership from the World Bank in 1960 and is “not included” in the World Bank’s “annual Doing Business report.” North Korea is also not a member of the World Bank. See “Cuba: Country Profile.” *Nordea.* <https://www.nordeatrade.com/en/explore-new-market/cuba/investment> and Morrow, Daniel. "Possible World Bank Assistance to North Korea: Issues and Challenges." *Asian Perspective* (2006): 37-67. [↑](#footnote-ref-6)
7. A natural disaster can be defined as the “net impact” of a natural shock “such as an earthquake or hurricane.” See Cohen, Charles, and Eric D. Werker. "The Political Economy of` `Natural Disasters.’” *Journal of Conflict Resolution* 52, no. 6 (2008): 795-819. [↑](#footnote-ref-7)
8. Several studies in the last decade have demonstrated the relationship between women’s representation in parliament and infant mortality. This theoretical link is a logical extension of findings of several earlier studies which drew a connection between women’s status and “child survival.” See Macmillan, Ross, Naila Shofia, and Wendy Sigle. "Gender and the politics of death: female representation, political and developmental context, and population health in a cross-national panel." *Demography* 55, no. 5 (2018): 1905-1934. [↑](#footnote-ref-8)
9. Boehmer, Ulrike, and John B. Williamson. "The impact of women's status on infant mortality rate: A cross-national analysis." *Social Indicators Research* 37, no. 3 (1996): 333-360. [↑](#footnote-ref-9)
10. Cannon, Terry. "Vulnerability analysis and the explanation of ‘natural disasters.’" *Disasters, development and environment* 1 (1994): 13-30. [↑](#footnote-ref-10)
11. “Variables for sustained growth 2015 index.” *KPMG international*. <https://assets.kpmg/content/dam/kpmg/pdf/2016/01/variables-for-sustained-growth-2015-index.pdf> [↑](#footnote-ref-11)
12. When “population” is scored high, the “trade % of GDP” tends to be lower. [↑](#footnote-ref-12)
13. Helen Epstein and Kristin Ashburn explain that epidemiologists have grappled with determining why HIV infection rates are particularly higher in African countries compared to other countries with similar socioeconomic and geopolitical conditions. One theory that emerged in the 1990s held that the spread of HIV in Africa is due to higher rates of sexual promiscuity. This theory received pushback but has recently been revisited and refined by sociologist and statistician, Martina Morris. According to Morris, it is not that sexual promiscuity is higher in African countries. A person infected with HIV who has sex “once with hundreds of different partners,” is likely to “infect only one of them.” See Epstein, Helen, and Ashburn Kristin. “Why is Aids Worse in Africa?” *Discover.* <https://www.discovermagazine.com/health/why-is-aids-worse-in-africa> [↑](#footnote-ref-13)