

STATISTICAL METHODS II
ASSIGNMENT 10X
DUE: 31 MARCH 2011

A new vote dataset, but the same goals:

H_0 : There is no evidence of vote fraud in this election.

H_A : There is statistically significant evidence of vote fraud in this election.

Two days after Mubarak stepped down on February 11, the Supreme Council of the Armed Forces dissolved the parliament and suspended the constitution. A committee was then appointed by the supreme council to amend some of the articles of the constitution in ten days. The people of Egypt went to the polls today to vote on changing the constitution. They had a single vote: Yea or Nay on the package of nine changes to the constitution. Initial reports suggest that the turnout was very high for this, the first vote after the Mubarak regime. The nine changes are as follows:

- A revision to Article 75, adding two requirements to being able to run for president: First, the president's parents cannot be dual citizens of another state; and second, the president may not be married to a non-Egyptian.
- A revision to Article 76 that would preserve the language allowing established parties to field candidates, but add that Independents would have to fulfill one of two requirements: either receiving endorsements from 30 members of parliament, or signatures from 30,000 eligible voters living in 15 governorates.
- A revision to Article 77 reducing the term of office for the president from six years to four, and adding a limit of two terms.
- A change to Article 88 providing for full judicial oversight of the entire electoral process, from voter registration to the announcement of results.

- A change to Article 93 having the supreme constitutional court, rather than the parliament, decide who is eligible to take office.
- A change to Article 139 requiring the president to appoint a vice president within 60 days of taking office. If the vice president's job becomes vacant, the president must immediately appoint a replacement.
- A change to Article 148 wherein the president can still declare a state of emergency, but the referendum makes two changes: A parliamentary majority would have to approve the declaration within seven days; and, if the president seeks to extend it beyond six months, it would be subject to a public referendum.
- The total abolishment of Article 179, which currently gives the government practically unlimited power to "counter the dangers of terror."
- Changes to Article 189 that will require that constitutional changes requested by the president to cabinet approval; changes requested by the parliament must be endorsed by at least half of the members in both houses.

Furthermore, the revised article 189 would also require the new parliament to appoint a constitutional assembly within six months of taking office. That assembly would draft a new constitution, which would then be submitted to a public referendum.

As with any constitutional referendum following a popular uprising, this seeks to fix the abuses or power under the last president. However, as every army fights the previous war, these changes may not serve the interests of Egyptians. Many people in Egypt agree. Some political parties are calling for a 'No' vote in favor of an entirely new constitution. Some of the original protesters, who caused Mubarak to leave Egypt, say the changes do not go far enough.

No one is complaining about the referendum in terms of presence of vote fraud, but let us test for it anyway. The dependent variable is the proportion of vote found invalid. The sole independent variable is the proportion of the vote in favor of the constitutional

referendum. You should try appropriate random components, checking the assumptions. Once you have tried them, select the best of the group.

If your model showed that vote in favor of the referendum was statistically significant, provide a graph of proportion of vote found invalid (Y) vs. the proportion of the vote in favor of the referendum (X). Fit a prediction curve to this data (black), as well as a pair of 95% confidence bands (red, dashed). Provide a legend. Make sure your axes are properly labeled.

If you do not find statistical significance, you do not need to provide the graph. However, you may wish to do so, for practice.

Extra credit: Add to the graph a horizontal line corresponding to the mean proportion of invalidated ballots (blue, dash-dotted).

The dataset we will use for this assignment is available at

<http://www.electoralforensics.org/datasets/egy2011referendum.csv>

The format of this dataset is “wide,” which is that to which we are accustomed. A description of the data can be found here:

[http://www.electoralforensics.org/datasets/view.php?
data=egy2011referendum&state=eg](http://www.electoralforensics.org/datasets/view.php?data=egy2011referendum&state=eg)

As always, get started early and ask if you are unsure. *Ciao!*