Son Bias in the US: Evidence from Business Names*

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Are American businesses with the word "son(s)" more common than the word "daughter(s)"? To answer the question, we assemble data on business names. In the US, businesses are registered with the state. And to allow businesses to check whether a particular name is taken, etc., each state provides a way to search for business names. But most states do not allow for sophisticated searches or return all the relevant search results. Because of these reasons, we can only estimate a very conservative lower bound. In all, based on data from 40 states, across states, the median ratio of businesses with the word 'son(s)' in their name to the word 'daughter(s)' is 12:1.

When we split by region, we find that the son to daughter ratio is generally higher in the Northeast and the Midwest compared to the South and the West. Analysis by political preferences leaves that democratic majority states have higher ratios than republican majority states. Lastly, counter-intuitively, correlation with state GDP is weak.

Data and Methods

In the United States, businesses have to register with a state. Each state provides a website to search for business names. But the functionality of these websites varies a lot. Some states do not return all the search results. Some only allow for particular regex searches—returning all the names that include the search term. We describe the concerns in further detail below, including how we address the challenges:

1. **Search results for son(s) are inflated.** There are three reasons for that:
    - Son is part of many English words, from names such as Jason and Robinson to ordinary English words like mason (which can also be a name).
    - Son is a Korean name.
    - Some businesses use the word "son" playfully. For instance, "son" is a homonym of sun, and some people use that to create names like "son of a beach."

    We address the first issue by cleaning the data using regular expressions, only looking for exact matches of son and sons. We don't address the other two concerns because when we carefully browsed the search results, we found that such cases were not that uncommon.

2. **Limited number of results returned.** Some states return all the relevant search results, but others limit the number of returned results. For example, Alabama only displays the "first" 1,000 businesses. The truncated returned set means we only know that were more than 1,000 results. We do, however, know how many—it could be 1,001 or 500,000. This limitation only impacted search results of "son(s)." And it means that we can only provide a conservative estimate of the lower bound.

Outside of the two concerns we note above, there is one more concern. Having "son" in the name doesn't preclude the existence of the word daughter. And vice versa. When we browsed the results, we found that this was fairly infrequent. So we chose to ignore this.

In all, we got data for 36 states—the remaining 14 were left because getting the data proved onerous. The 36 states for which we got the data represent 69.9% of the US population, 71.2% of the GDP and 71% of the registered businesses.

*The data and scripts used are posted here: https://github.com/soodoku/sonny_side.

We enriched the dataset with some state level data. We added the census region (Northeast, West, Midwest, and South), population of the state, GDP, major political party of the state, and number of businesses in each state. The sources for each are in the references. Table 1 describes some of the key features in the data.

Table 1: Summary of the Data

State	Ratio	US Region	Population	GDP	Establishments	Political Party
Alabama	7	South	0.015	0.011	0.013	Republican
Alaska	11	West	0.002	0.003	0.003	Republican
Arkansas	17	South	0.009	0.006	0.008	Republican
California	24	West	0.120	0.145	0.119	Democratic
Connecticut	20	Northeast	0.011	0.013	0.012	Democratic
Florida	4	South	0.065	0.051	0.070	Republican
Georgia	12	South	0.032	0.029	0.029	Republican
Hawaii	17	West	0.004	0.004	0.004	Democratic
Idaho	2	West	0.005	0.004	0.006	Republican
Illinois	48	Midwest	0.039	0.042	0.041	Democratic
Indiana	25	Midwest	0.021	0.018	0.019	Republican
Kansas	5	Midwest	0.009	0.008	0.010	Republican
Kentucky	4	South	0.014	0.010	0.012	Republican
Maryland	2	South	0.018	0.020	0.018	Democratic
Massachusetts	41	Northeast	0.021	0.028	0.023	Democratic
Michigan	24	Midwest	0.030	0.026	0.028	Republican
Minnesota	2	Midwest	0.017	0.018	0.019	Democratic
Mississippi	12	South	0.009	0.006	0.008	Republican
Montana	4	West	0.003	0.002	0.005	Republican
Nevada	72	West	0.009	0.008	0.008	Democratic
New Hampshire	27	Northeast	0.004	0.004	0.005	Democratic
New Jersey	2	Northeast	0.027	0.030	0.030	Democratic
New York	2	Northeast	0.059	0.082	0.070	Democratic
North Dakota	26	Midwest	0.002	0.003	0.003	Republican
Ohio	26	Midwest	0.036	0.033	0.033	Republican
Oregon	4	West	0.013	0.012	0.015	Democratic
Rhode Island	17	Northeast	0.003	0.003	0.004	Democratic
South Carolina	69	South	0.016	0.011	0.014	Republican
South Dakota	12	Midwest	0.003	0.003	0.003	Republican
Tennessee	2	South	0.021	0.018	0.017	Republican
Utah	5	West	0.010	0.009	0.010	Republican
Vermont	22	Northeast	0.002	0.002	0.003	Democratic
Washington	15	West	0.023	0.028	0.024	Democratic
West Virginia	2	South	0.005	0.004	0.005	Republican
Wisconsin	20	Midwest	0.018	0.016	0.018	Republican
Wyoming	11	West	0.002	0.002	0.003	Republican

Results

In all, as shown in Figure 1 we find that a conservative estimate of son to daughter ratio is between 2:1 to 72:1 across the 36 states where we have data with a median of 12:1.

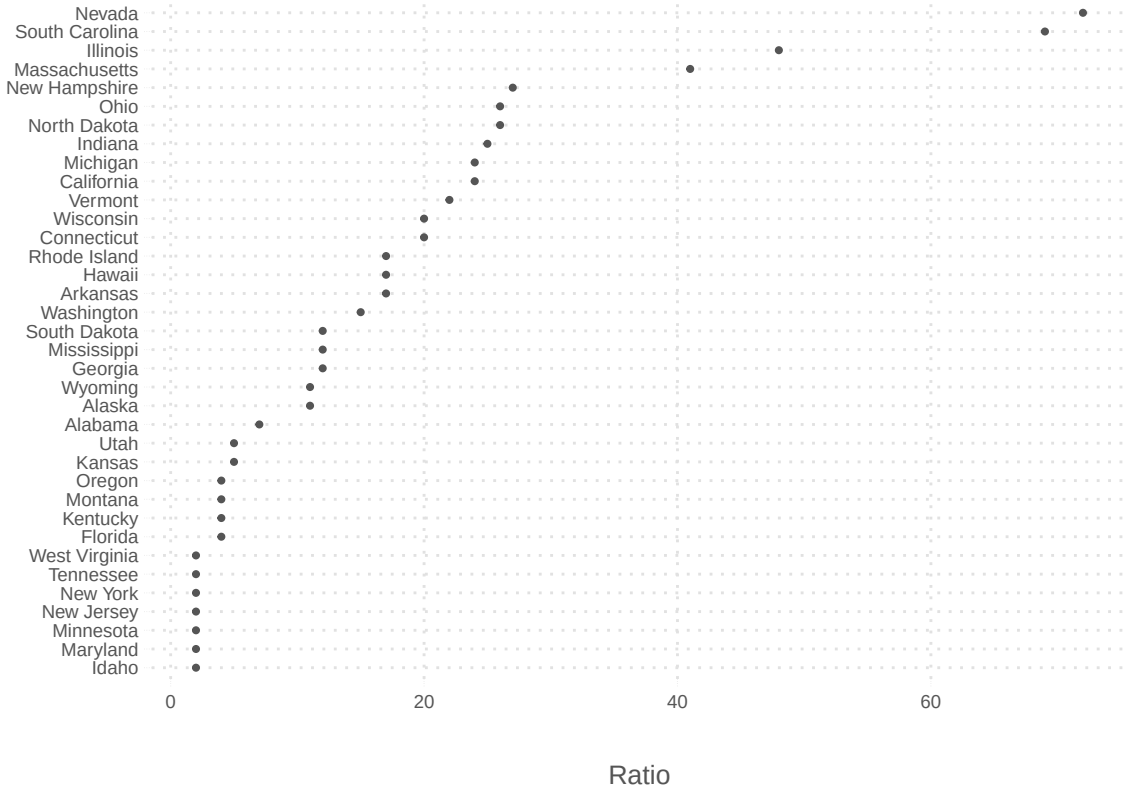


Figure 1: Ratio of business names with the word 'son' to 'daughter'

Covariates of Son Bias

We now proceed to explore how these results vary by location of the state in the United States, by the state population and political party and by its GDP and number of busines establishments.

a) **Differences by US Region**: When we look at the estimate of son to daughter ratio by Region in USA we see states in the Midwest and Northeast with higher ratios when comparing to the West and particularly the South. Figure 2 shows the biggest gap is Midwest vs South with a median ratio of 24:1 vs 5:1 respectively.

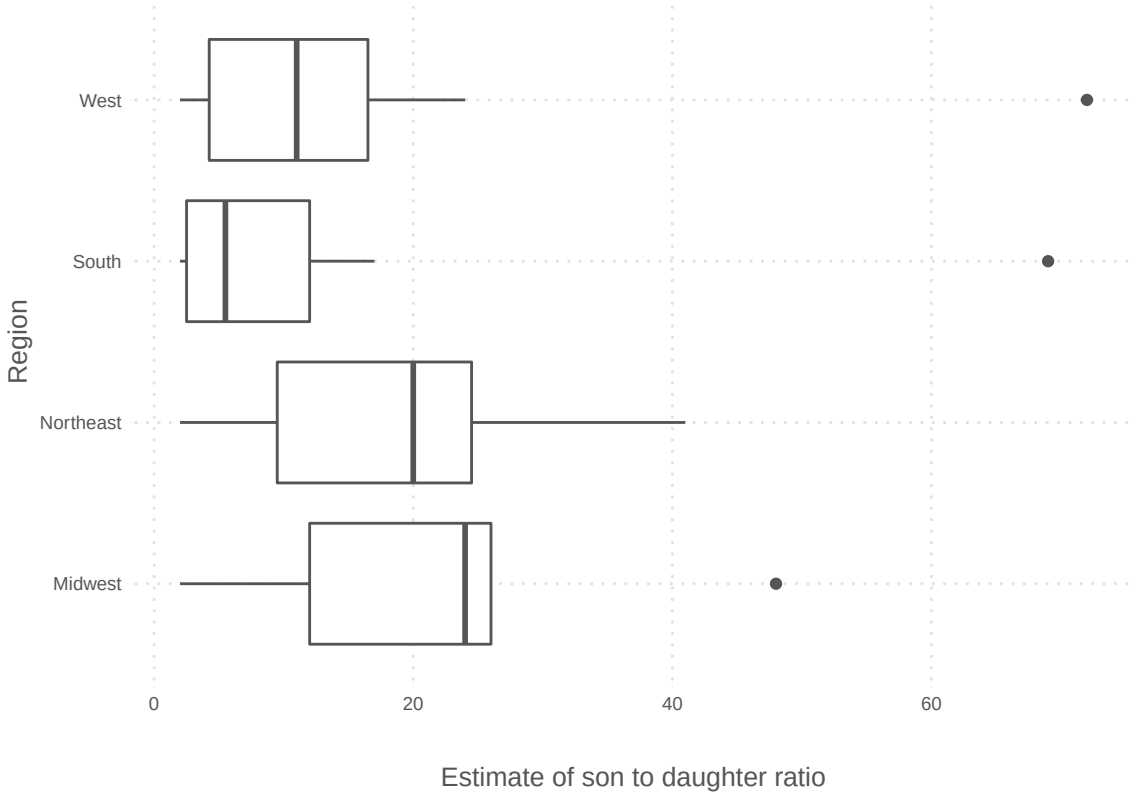


Figure 2: Estimate of son to daughter ratio by US Region

b) **Relationship with the Population size of the State**: When we look at the estimate ratio of son vs daughter with the population fo the state we don't see any relationship between these data points. In fact the correlation if basically zero as seen in Figure 3.

c) **Relationship with the GDP of the State**: We also looked at how the differences of the ratio of business names using son vs daughter could vary by state as it relates to the size of the state in terms of percentage of the gross domesic product (GDP) of the country. We didn't find any evidence of relationship between these two with a correlation of basically zero. The chart is on the appendix B.

d) **Relationship with the number of Establishments of the State**: We also obtained data from the census organization from US that offers the number of registered establishments in the USA, this is not necesarily the same as the number of business companies registered per state but since obtaining that exact number wasn't not possible we use this as a proxy. Again, no evidence or correlation is observed. The chart is on the appendix C.

e) **Relationship with the major Political Party of the State**: Finally we looked at the voting data from the 2016 elections and compare how the ratio of son vs daughter is when separating states with a

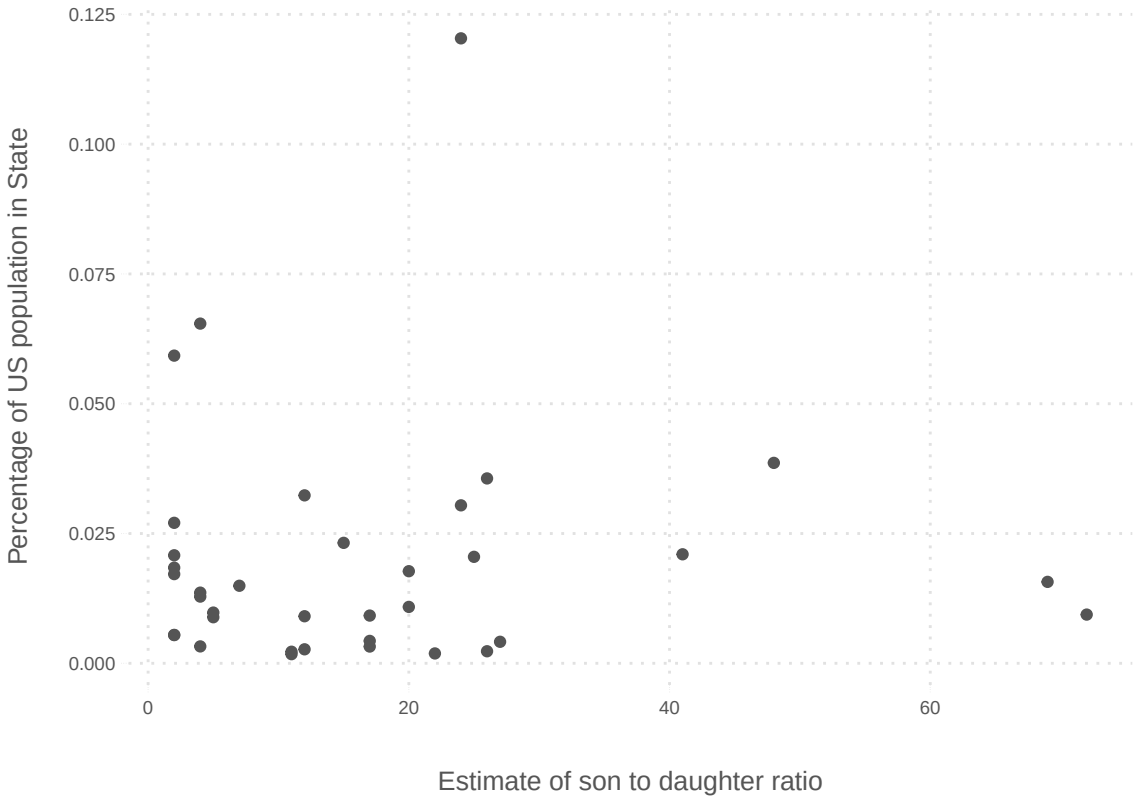


Figure 3: Estimate of son to daughter ratio vs % of US population per state

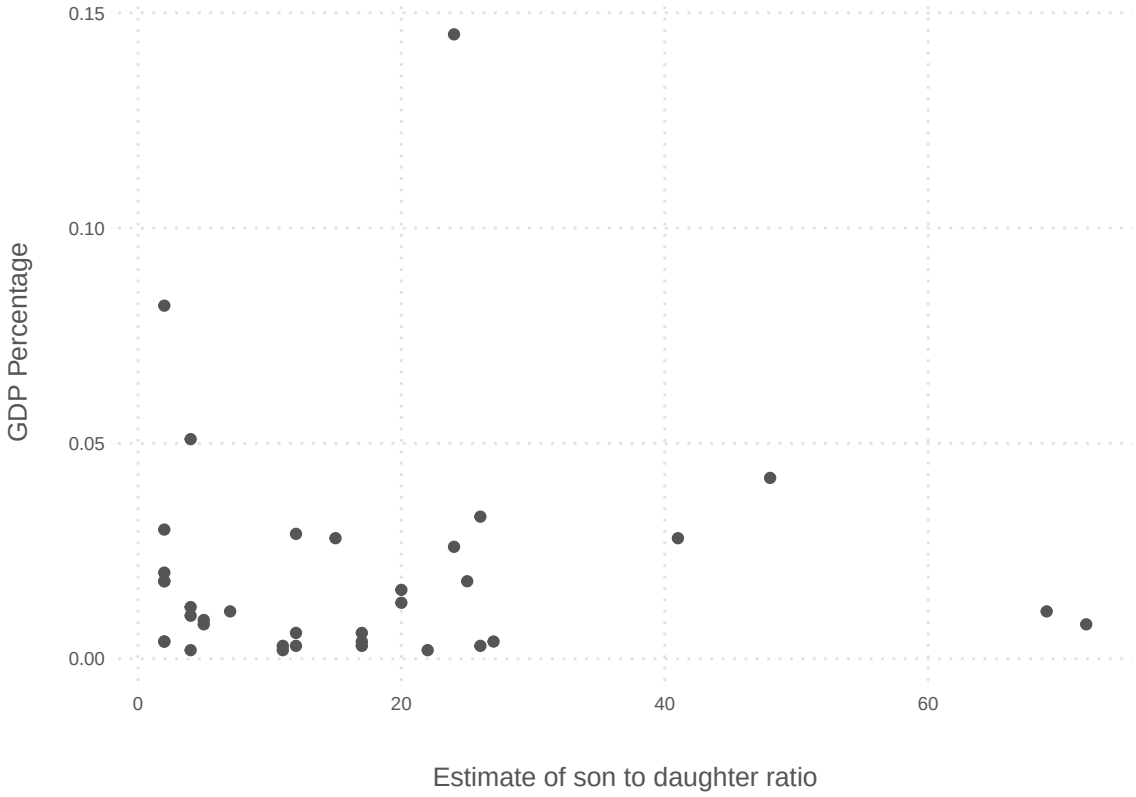


Figure 4: Estimate of son to daughter ratio vs GDP % of US

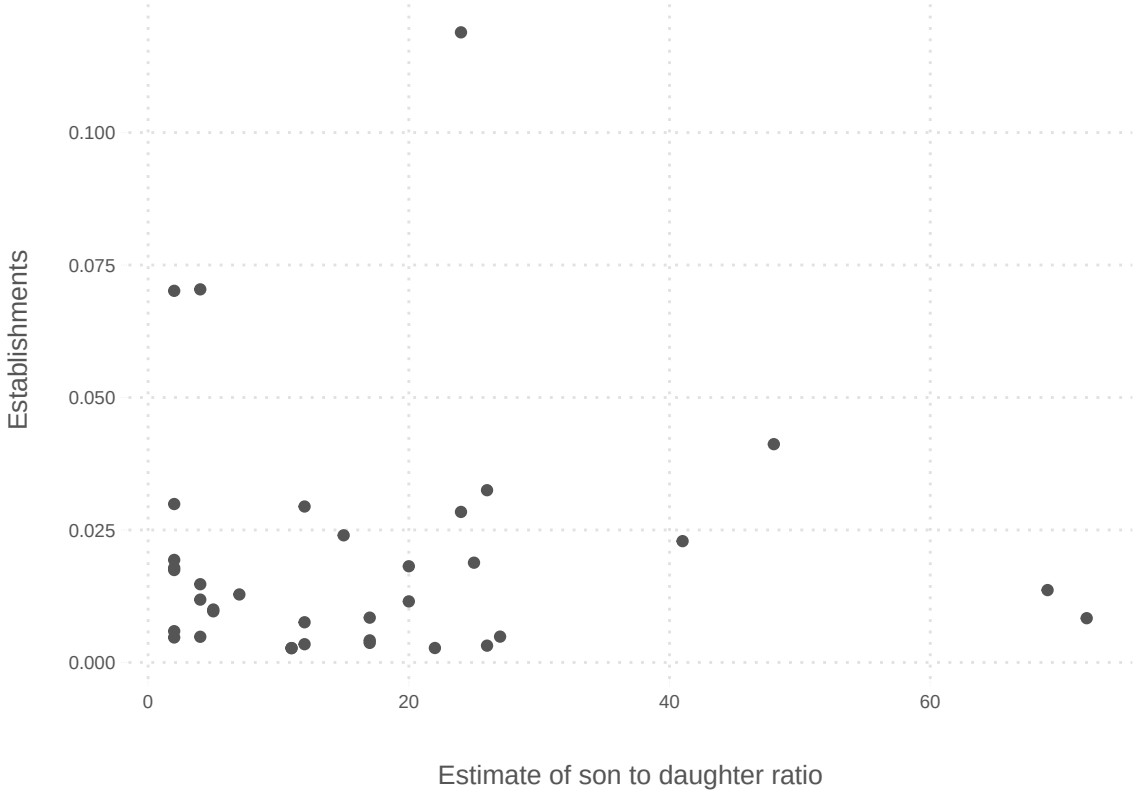
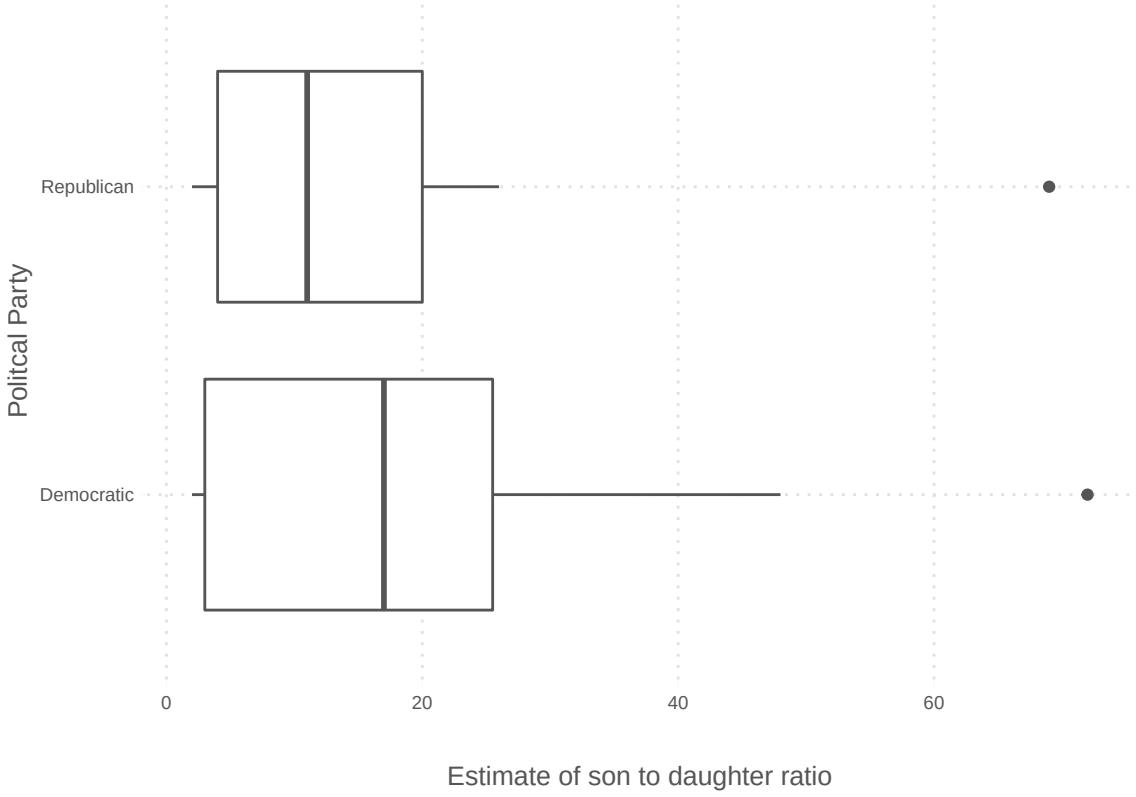


Figure 5: Estimate of son to daughter ratio vs # of Establishments

majority of Democratics vs Republicans. The ratio tends to be higher on Democratics states with a median of 17 vs a median of 11 for Republican states - see appendix D.



Conclusion

There is clearly an inclination to name businesses including the word son(s) vs daughter(s). We found evidence for 36 states that that a conservative estimate of son to daughter ratio is between 2 to 1 to 72 to 1 across the 36 states where we have data with a median of 12 to 1. Despite not having data for 50 states we feel this is a good representation of the whole country since these 36 states represent 69.9% of the US population, 71.2% of the US GDP and 71.% of the registered establishments.

Although we didn't find any relatioship with the size of the states in terms of GDP, population or number of establishments we do see some differences across regions and political parties dominating the state. We cannot conclude any causality because of this but further exploration is recommended.

References

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