

Project 3 - Building Data Dashboards

For this project I decided to work with the US Census Demographic Data and specifically look at the poverty, unemployment and median income trend within the United States at the state level.

Design

The data that was available was at county level. In order to make deductions at the state level, I added the following calculated fields:

Total Population Under Poverty - $([Poverty] * [Total Pop])/100$

This number represents the total population under poverty for each county.

Poverty % - $(SUM([Total Pop Under Poverty])/SUM([Total Pop]))*100$

This number represents the total poverty for each state as a percentage.

Unemployment State - $(Sum([Total Pop Unemployed])/Sum([Total Pop]))*100$

This number represents the total unemployment for each state as a percentage.

Median Income State - $MEDIAN([Income])$

This number represents the Median Income at state level.

Construction Jobs - $([Construction] * [Employed])/100$

This number represents the total Construction jobs for each county.

Construction Jobs State - $(SUM([Construction Jobs])/Sum([Employed]))*100$

This number represents the total Construction jobs for each state as a percentage.

Office Jobs - $([Office] * [Employed])/100$

This number represents the total Office jobs for each county.

Office Jobs State - $(Sum([Office Jobs])/Sum([Employed]))*100$

This number represents the total Office jobs for each state as a percentage.

Production Jobs - $([Production] * [Employed])/100$

This number represents the total Production jobs for each county.

Production Jobs State - $(Sum([Production Jobs])/Sum([Employed]))*100$

This number represents the total Production jobs for each state as a percentage.

Professional Jobs - $([Professional] * [Employed])/100$

This number represents the total Professional jobs for each county.

Professional Jobs State - $(\text{Sum}([\text{Professional Jobs}])/\text{Sum}([\text{Employed}]))*100$

This number represents the total Professional jobs for each state as a percentage.

Service Jobs - $([\text{Service}] * [\text{Employed}])/100$

This number represents the total Service jobs for each county.

Service Jobs State - $(\text{Sum}([\text{Service Jobs}])/\text{Sum}([\text{Employed}]))*100$

This number represents the total Service jobs for each state as a percentage.

Moreover I also grouped the States as below:

High Poverty - List of states with poverty levels 16.29% to 45.52%

Low Poverty - List of states with poverty levels 8.93% to 11.66%

Mid Poverty - List of states with poverty levels 12.05% to 15.78%

Additionally I created the following parameter:

Select Job -

CASE [Choose Job]

WHEN 'Professional' then $(\text{Sum}([\text{Professional Jobs}])/\text{Sum}([\text{Employed}]))*100$

WHEN 'Service' then $(\text{Sum}([\text{Service Jobs}])/\text{Sum}([\text{Employed}]))*100$

WHEN 'Office' then $(\text{Sum}([\text{Office Jobs}])/\text{Sum}([\text{Employed}]))*100$

WHEN 'Construction' then $(\text{Sum}([\text{Construction Jobs}])/\text{Sum}([\text{Employed}]))*100$

WHEN 'Production' then $(\text{SUM}([\text{Production Jobs}])/\text{Sum}([\text{Employed}]))*100$

END

After adding these fields I created three dashboards - Maps, Relation Plots and Bar Charts.

The first dashboard - Maps, shows three maps depicting poverty, unemployment and median income for each state. The list on the right allows the user to select a group of states belonging to the high, low or mid poverty state group.

The high poverty selection depicts states with poverty levels 16.3% to 45.5%, unemployment levels 6.4% to 18.3% and median income levels \$16,852 to \$70,848.

The low poverty selection depicts states with poverty levels 8.9% to 11.7%, unemployment levels 2.9% to 8.8% and median income levels \$47,911 to \$70,471.

The mid poverty selection depicts states with poverty levels 12.1% to 15.8%, unemployment levels 4.7% to 10.5% and median income levels \$40,597 to \$69,526

The second dashboard - Relation Plots allows the user to select a group of states belonging to the high, low or mid poverty state group. Upon making a selection the user can see two plots: poverty vs unemployment and poverty vs median income. Both the plots have state populations in the size field.

The third dashboard - Bar Charts also allows the user to select a group of states belonging to the high, low or mid poverty state group. Upon making a selection the user can see five type of

jobs (construction, office, production, professional and service) allocation percentages amongst the selected state group. Moreover this dashboard also allows the user to choose a type of job to see a bar chart showing percentage allocation of that specific job across the selected state group.

Link to the three dashboards:

I wasn't able to save to Tableau Public. I am attaching a separate PDF with screenshots.

Insights

When the user makes the three different selections on the Maps dashboard, we can see the general trend of low poverty associated with low unemployment and high median income and high poverty associated with high unemployment and low median income. To get a deeper insight of these trends the user can click on the next dashboard (Relation plots).

Similar to the prior dashboard the user can select a group of states belonging to the high, low or mid poverty state group.

Upon selecting the low poverty state group, we can see that the first plot shows states within this group have an unemployment rate (4.9% - 8.8%) except North Dakota which is at a poverty level of 11.5% and unemployment rate of 2.9%. Moreover New Hampshire has a relatively high unemployment rate of 5.8% for its low poverty level of 8.9%.

The median income chart below shows that the median income for all states within the low poverty group is in the (\$47,911 - \$70,471) range. From this plot we can see that the median income for North Dakota is \$54,960 and New Hampshire is \$59,247.

For further understanding of this trend the user can click on the next dashboard (bar charts).

Similar to the prior two dashboards, the user can select a group of states belonging to the high, low or mid poverty state group. Upon selecting the low poverty states group, the user can see two bar charts. The first bar chart depicts job percentage allocation in each state. For the second bar chart the user can choose a type of job to see percentage allocation of a specific job across the selected state group.

After selecting the low poverty group, the user can see that North Dakota has the second highest percentage of construction jobs (13.2%). This with its low population of 722K, seems to be the reason for its low unemployment rate. The highest percentage of construction jobs are in Wyoming (16.0)%. This coupled with its small population of 580K is also an indication for its relatively low unemployment rate (4.9%).

New Hampshire has more professional jobs than North Dakota - (39.8% vs 35.0%) and fewer construction jobs (9.0% vs 13.2%). These two reasons with its higher population 1.3 MM seem to be the cause for its higher unemployment.

Maryland has the highest percentage of professional jobs in this group (44.6%), hence the high median income of \$66,746.

Next the user can select mid poverty states within the map, relation plots and bar chart dashboards. The poverty vs unemployment relation plots for this group of states shows that the unemployment ranges from (4.7% - 10.5%).

South Dakota has an unemployment rate of 4.8% and poverty of 14.1%. This unemployment rate is low compared to other states within the same group with lower poverty levels (12.1% - 13.5%) and higher unemployment range (5.0% - 8.0%). Moreover Nevada with a poverty level of 15.50%, has an unemployment rate of 10.5%. This unemployment rate is relatively higher than other states with same or higher levels of poverty (15.5% - 15.8%) and lower unemployment rate (7.2% - 8.2%).

The median income for this group of states is between \$40,597 and \$69,526. Here we see that the median income for South Dakota's 843K population is \$48,416 and Nevada's 2.8 million population is \$51,575. Rhode Island's 1.1 million population has the highest median income of \$69,526.

For further understanding of these trends the user can click on the next dashboard (bar charts) and click the mid poverty group. From the job allocation bar chart we can see that South Dakota has the third highest construction jobs - 11.0%. This factor coupled with its small population of 843K is a reason for its lower unemployment rate. Moreover 34.8% jobs are professional, hence the median income of \$48,416. Montana and Idaho have the most construction jobs - 12.8% and 11.9%. However both these states have higher poverty and higher unemployment (15.2%, 6.3%) and (15.5% and 7.2%). The median income in these two states is lower than South Dakota (\$44,267, \$43,081 vs \$48,416). Additionally they both have larger populations also (1 MM, 1.6 MM vs 843K).

Nevada's highest percentage of service jobs (27.8%) and second highest percentage of office jobs (26.0%) seems to be the reason for its relatively high median income of \$51,575. However construction and production jobs are at 8.7% and 9.8%. These are both on the lower side of this group of states. Hence the high unemployment rate of 10.5%.

Rhode Island's high percentage of professional, office and service jobs (36.9%, 24.4%, 20.2%) and its low population (1.1MM) account for its high median income (\$69,526).

Next the user can select high poverty states within the map, relation plots and bar chart dashboards. When looking at poverty vs unemployment, we can see that unemployment ranges from (6.4% - 18.3%). Texas and Oklahoma depict low unemployment (7.1%, 6.4%) with high poverty (17.3%, 16.7%) in comparison to other states in the same group which are at lower poverty levels (16.3% - 16.7%) and higher unemployment levels (9.4% - 10.0%). Excluding Puerto Rico the highest unemployment is at 10.5%.

Upon looking at the poverty vs median income plot we can see that the median income range for these states is (\$16,852 - \$70,848). Texas with a population of 26.5MM has a median income of \$44,674. Oklahoma with a population of 3.8MM has a median income of \$43,781. Excluding Puerto Rico and District of Columbia, the Median income for the high poverty group of states is \$33,749 - \$53,075.

For further understanding of these trends the user can click on the next dashboard (bar charts) and click the high poverty group.

Both Texas and Oklahoma have high percentage of professional jobs (35.1%, 33.3%), service jobs (17.7%, 17.6%), office jobs (24.4%, 24.2%). This explains the high median income in both

states (\$44,674, \$43,781). Moreover the high percentage of construction jobs (10.9%, 11.7%) explain the relatively low unemployment rate in the two states.

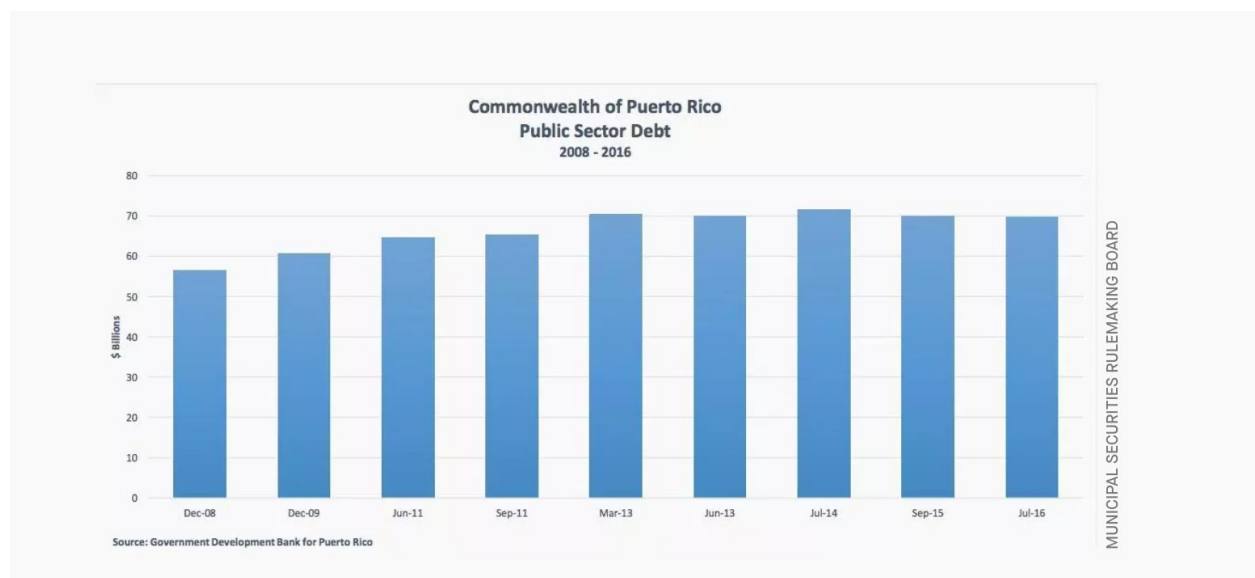
District of Columbia has the highest percentage of professional jobs amongst all state groups (60.9%). This coupled with a low population of 647,484 explains the high median income of \$70,848.

Puerto Rico has the highest poverty and unemployment rate amongst all state groups (45.5%, 18.3%). It has high percentage of professional jobs (31.9%). Moreover it has the second highest percentage of service jobs (20.6%) and the highest percentage of office jobs (27.7%) amongst this group of states. However construction and production jobs are on the lower range (9.6%, 10.2%).

In order to further understand this drastic poverty, unemployment and median income difference between Puerto Rico and rest of the United States, I considered the following website

<https://qz.com/1091341/puerto-ricos-eye-popping-economic-situation-in-charts/>

According to this website cost of living is exceptionally high in Puerto Rico. Moreover it has a declining population. The Puerto Rican statistics office stated “In 2015, all indicators of migration hit new records, as net emigration to the US reached 64,000.” Additionally cost of living is exceptionally high in Puerto Rico and it has massive debt:



All these factors are a reason for its high poverty, high unemployment and low median income

