
Income Inequality Visualization

Project Proposal

Basic Info

Team Members

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Repository

https://github.com/jarednielson/income_vis

Background and Motivation

Income inequality has steadily grown since the mid 1970's. In 1975 the top 1% of earners captured 8.9% of new income created, their lowest share in the past 100 years. Since then the percentage of total income for top earners (both in the top 10% and top 1%) has increased, peaking at 50% and 22% respectively just prior to the 2008 financial crisis (Saez, 2016). Total income for top earners dropped post 2008, but quickly recovered. From 2008 to present the top 1% of earners have more than made up for losses in the crisis increasing their income from 2008 to 2012 by 34.7% while the bottom 99% saw incomes increase by a modest 0.8% during the same time period (Saez, 2016).

The gap between top earners and the rest of the country is at heights not seen since the before great depression when top earners captured a 50/25% split for top 10% and 1% respectively (Saez, 2016). The economic policies enacted by the Roosevelt administration helped mitigate income inequality and restore balance between top and bottom earners from the 1940s to the 1970s. At which point more regressive policies were enacted that have led to the state we see today. The 1940s and 50s saw the highest marginal tax rates peaking at 92% in 1951 and 1952. While the rates dropped in the 1970s the lowest marginal tax rate for top earners was during the Reagan Administration in the late 1980s at 28%. Rates have gone up since then but are still only $\frac{1}{3}$ of their peak in the 1950s (Tax Policy Center, 2017).

Why is this concerning? Income inequality isn't just about money, it is about quality of life. The gap in life expectancy between those in the top 1% and those in the bottom 1% is 14.6 years (Chetty, Stepner and Abraham, 2016). Millions of Americans cannot afford health insurance and lack access to health care, affordable housing, and even food. This is a life and death issue.

In December of 2017 congress passed and President Trump signed into law tax cuts for the wealthiest of Americans. Among many, especially those at the top there seems to be an unwillingness to accept the data at its face value, that as the richest prosper the middle and lower class struggle. One of these reasons may be that most people can't internally visualize just how skewed the income distribution is. Most papers on income inequality present graphics such as line and bar charts, but fail to create compelling and interactive visualizations that drive home the reality of income inequality. Our goal is to create a visualization that will drive home both the reality and the scale of income inequality.

Project Objectives

1. Prior to seeing the data, users will be given an opportunity to create two income distributions. The first will be an idealized version that they think might be considered fair and the second what they predict the distribution actually looks like. These distributions will then be saved and shown to the user as a comparison to present and historical income distributions.
2. Allow users to explore historical income distributions as well as historical marginal tax rates, and other interesting historical features, like average home price per year to allow the data to be put in real context.
3. Allow users to explore income distributions per state (as data is available).
4. Create a visualization for top earners in the United States (Jeff Bezos, Mark Zuckerberg, etc.) that shows how many average or low income earners it takes to make up the wealth of these individuals.

Data

Historical income data will be obtained from the Census Bureau. They have both a json API and xml files available:

<https://www.census.gov/data/developers/updates/new-discovery-tool.html>

<https://www.census.gov/data/tables/time-series/demo/income-poverty/historical-income-households.html>

Historical Tax rates will be obtained from the Tax Policy Center:

<https://www.taxpolicycenter.org/statistics/historical-highest-marginal-income-tax-rates>

Data Processing

Because of the wealth of data that exists from these sources as well as the preformatted nature of them as well, including already constructed json, the need for advanced data processing is low. From the census api it is easy to obtain almost directly usable json representations of the information that we desire to compare.

Most if not all of the data processing that will need to be done can be accomplished by simply applying filters and using built in tools in d3 and JavaScript. These subsets of the data can then be directly visualized or further manipulated programmatically.

Visualization Design

There are potentially a large number of visualizations that are able to encode the data that is acquired through the census, however, we will specifically be looking at several key features of this data that we must encode. Groups based on income ranges, the number of people in each of these subgroups, and chronology / time are the main elements that we will need to encode in our visualization.

The first prototype uses a map to encode information about individual states and wealth distribution in these states. When a state is selected it shows a small tooltip displaying extra information about the state, and a time slider that shows the change in income disparity over time. The second prototype is a line chart that allows the user to 'guess the data' line chart and then reveals to them the actual distribution and could have chronology options as well based on year this will show users how common it is to misjudge the problem. The last prototype is the simplest, it is a histogram with the income groups and shows their distribution over time.

To combine all three and present the story of the data, we would like to possibly implement some simpler form of all three, and create a multiphase visualization similar to scrolly telling or the new york times' multiphase 3d visualization. Beginning with requesting the users guess at distribution first, showing the actual distribution with the histogram, and then letting them explore the data with the map and year slider. This provides a hook introduction, shows useful easy to digest data, and then allows for user interaction to promote memorability.

Other topics that we will look at include chronological information / events in relation to large tax cuts and its effects on the distinct income groups. Our objective is to show not only income disparity, but other topics around this including but not limited to political events, recessions and how these influence the 'wealth gap'. To show this we can add steps to the visualization that show snapshots of info, potentially before or after the map. It may be difficult to show these relationships faithfully without misconstruing the data, so the project will err on the side of caution with hard to prove areas and trends.

Must-Have Features

- Visualizations demonstrating the wealth gap and income disparities between different economic classes
- Helpful interactivity components that help demonstrate the story of the data, eg background knowledge on important events
- Visual components showing tax rates of these different economic groups

- Interactivity combining tax rates and income disparities

Optional Features

- Multiphase / scrollytelling interactivity and changes
- Highlight & explain historical events such as the dot com bubble, and the 2008 recession
- Allowing user customizability of what data is being displayed allowing for user data exploration

Project Schedule

Week 11
<ul style="list-style-type: none"> • Data acquisition and formatting done • Final design settled on
Week 12
<ul style="list-style-type: none"> • Data storage & formatting done • First basic visualization elements done • Line chart with basic features finished
Week 13
<ul style="list-style-type: none"> • Advanced Visualization components finished • Line chart advanced features done • Histogram begun
Week 14
<ul style="list-style-type: none"> • Advanced interactivity finished • Scrollytelling features started • Histogram done • Map basic features begun

Week 15
<ul style="list-style-type: none">• Polish visual design• Finished scrollytelling features• Map implementation finished

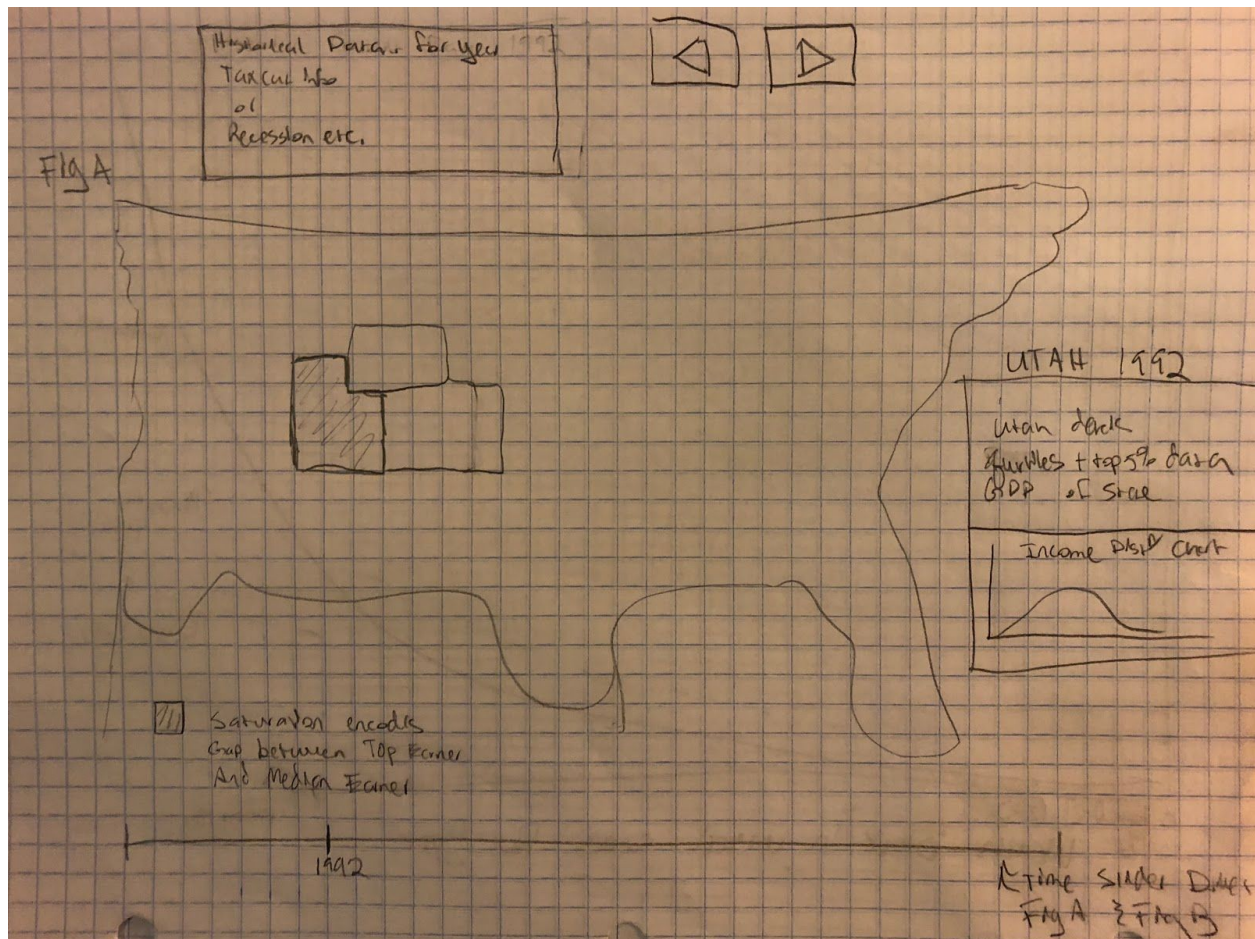
Works Cited

Chetty, R., PhD, Stepner, M., BA, & Abraham, S., BA. (2016). The Association Between Income and Life Expectancy in the United States, 2001-2014. *JAMA*, 315(16), 1750-1766. doi:10.1001

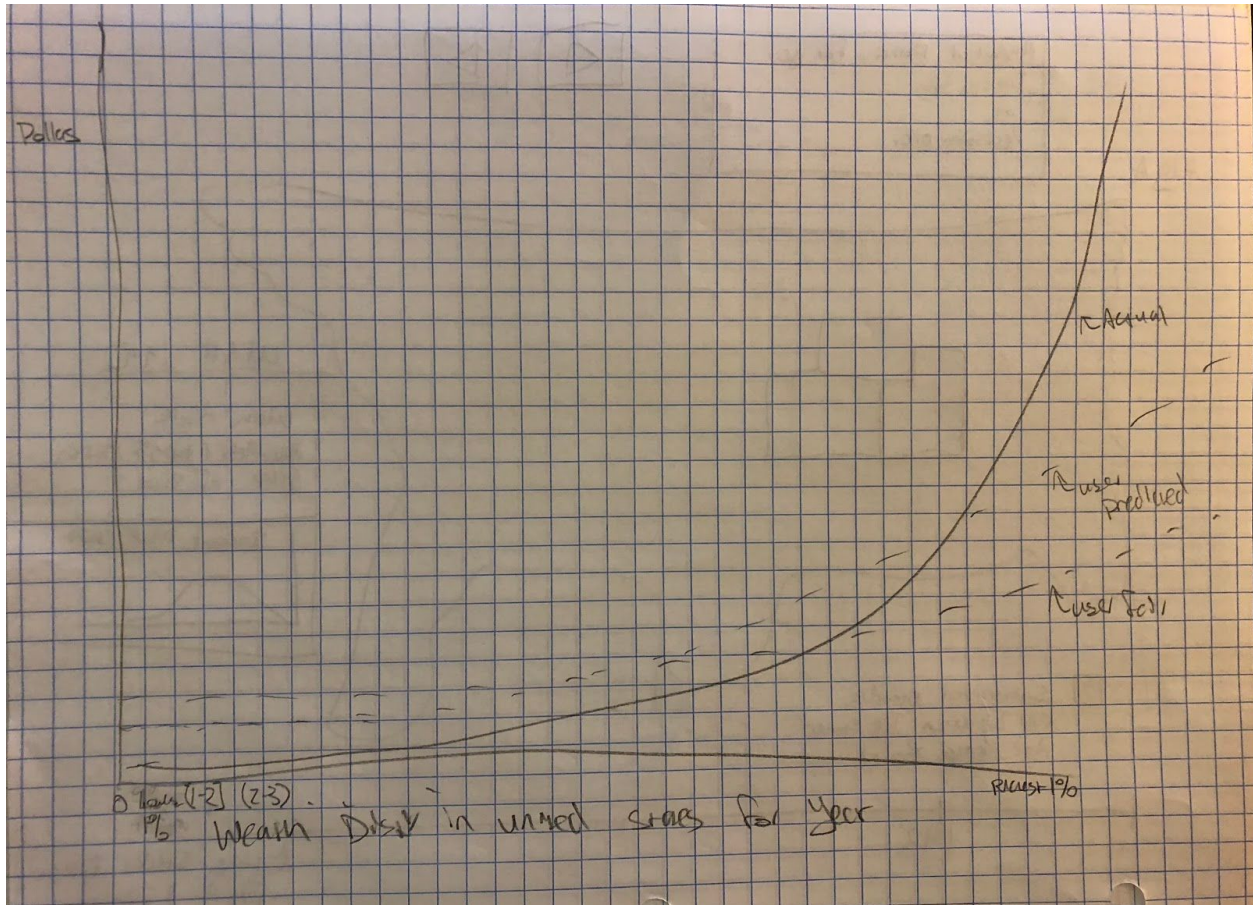
Saez, E. (2016). Striking it Richer: The Evolution of Top Incomes in the United States. Retrieved October 20, 2018, from <https://eml.berkeley.edu/~saez/saez-UStopincomes-2015.pdf>

Tax Policy Center. (2017, March 23). Historical Highest Marginal Income Tax Rates. Retrieved from <https://www.taxpolicycenter.org/statistics/historical-highest-marginal-income-tax-rates>

Design 1.



Design 2



Design 3.

