

CS 171: Project III

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Process Book || Spring 2013

Growing Globally

Growing globally is an international data set involving GDP, unemployment rates, and population data. We chose to pursue these variables because they are strong indicators of growth and development within nations. We are assessing these variables over time, for a period of about 16 years (1995-2010). We hope to show the impact of some of the major global economic events from these years as well.

We tried to visualize this data in such a way that you can truly appreciate the relationships between common metrics of growth and other similar growth mechanisms. We hope you enjoy our project!

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Background

Background

What was our project II?

In project II, we used data from primarily OECD nations regarding GDP, unemployment rates and life expectancy. We chose to pursue these variables because they are strong indicators of growth and development within nations. We are assessing these variables over time, for a period of about 15 years (1995-2010).

Background

Intended Users

Our intended user base changed slightly from project II to project III. In project II, we were trying to target users wishing to learn more about international growth GDP trends. With our visual encodings and choices of color and visually intuitive graphs, we hope to have our project accessible by the average person who would like to learn more about the influence of international economic events.

People who would likely find this visualization most appealing are those who are interested in learning more about economic trends, especially those surrounding international economic events.

Flaws

Too Few Growth Metrics

We realized that by only allowing the user to view GDP per capita, we were severely limiting the amount of growth-related information our audiences could understand and work with. Looking at various growth metrics is standard in economic practice, and allowing users to see the comparative relation between various metrics allows the user interest to be piqued about the variance in trends.

Not Enough Countries

While initially we thought it was beneficial to have a narrow geographic focus and primarily look at OECD countries, we realized after project two that the depth of our data is valuable in the country plane as well, because it was hard to have an interesting comparative analysis with all OECD countries, which have very similar economies and for which the different impact of global events (which was the majority of our story) were not that different.

No Story

Though our original graph had a variety of visualizations, it unfortunately did not provide much of a guidance to the user or a significant amount of information, because it was mainly focused on the user traversing the data by himself. Ultimately this meant that the user was unable to obtain as much information from the data as we hoped.

Goals

Goals

1. More accurately reflect the diversity of economies internationally
2. Incorporate more data
3. Provide a valuable story to the user

Changes

Data

We chose to also collect unemployment in addition to our existing data. We had originally collected population and life expectancy data as well though this data was a bit more challenging to locate and sparse, so we ultimately felt that it didn't add enough to our story to include. We also collected absolute GDP values, which were not as relevant for comparative analysis because this creates a bias in the data. We also thought it was not necessary to include all these variables in the thought that this might overwhelm the user, and so tried to use one of each of the major metric types: financially based and productivity.

Instead of focusing on solely OECD nations, we expanded our search to 183 nations. This expansion severely increased the amount of time investment in finding our data set, and required the use of Python and Google Refine to clean the data both programatically and through the features already available in Google Refine. Given that the data came from a variety of sources (including the IMF and the OECD site), the data came in various structures that we had to adjust to fit our desired format for the final JSON data.

Changes

Individual Visualizations

We decided to focus on two main individual visualizations. Though the type of visualizations remained the same (a map and a line graph), we changed how the two interacted and the message sent by each graph.

In the map, we made the countries clickable and rescaled our buckets (as we discussed during the course, the bins created for the display of information can be crucial in how its communicated) to better reflect the distribution of data. Though we didn't make the data perfectly proportionately scaled (to avoid representation bias for the higher income nations), we tried to remain fairly rigid to the proportions of the bins. We also included an event selector that allows the user to sort nations by the individual events that occurred during the time.

For the line graph we incorporated a feature allowing the users to interact with specific types of growth information, and also made the countries interact with the line graph above, as well as with the events on the side.

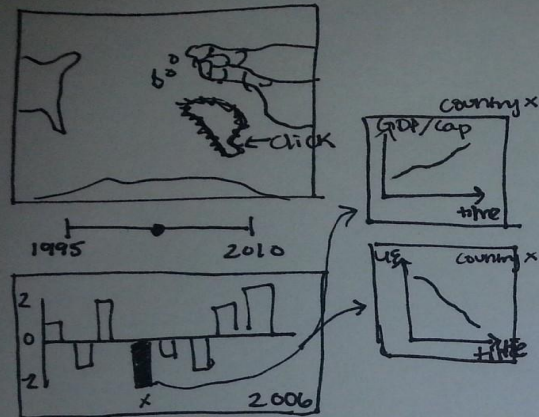
Story

As understood by the explanation of the individual visualizations previously, our story attempts to explore the international economic effects of major events from 1995 - 2010. Developing this story took many hours of pondering and many iterations of story development, because we wanted to ensure that the story we were trying to communicate made sense with the data that we had. While we were originally trying to make the data reflect changes in the comparative inter versus intra-national environment, we felt that that representation did not lend itself to user discovery of valuable information, and thus reshaped our message to accomodate that.

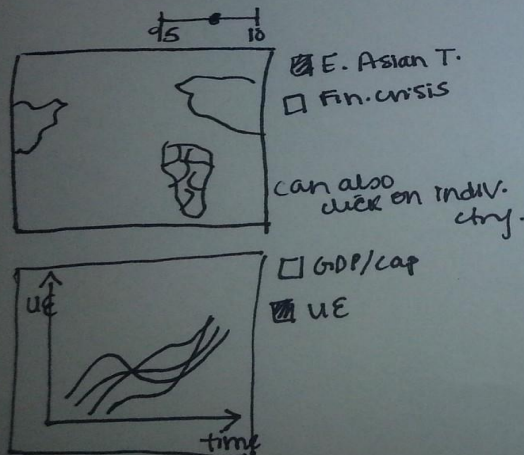
Additional Visualization Design

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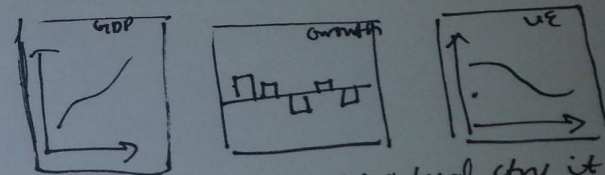
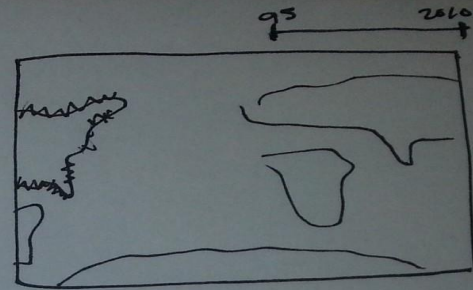
Iterations



visualization 1

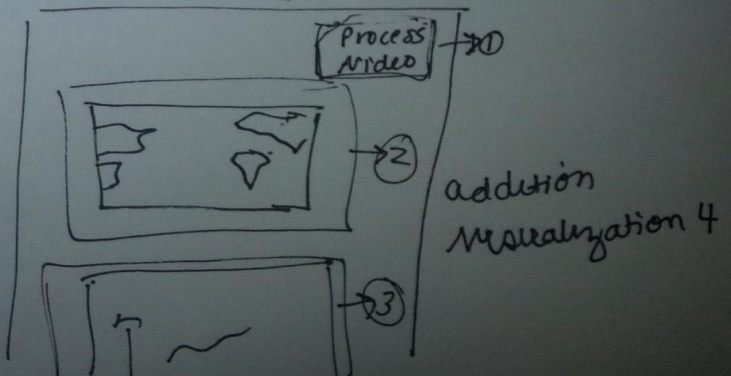


visualization 2.



click on individual try it
as graph.
visualization 3

use intro.js



Additional Visualization Design

Process & Challenges

This process involved a significant amount of consultation with our teaching fellows, and we also spoke to each other as Rachna designed the story that we would be telling. This was challenging because we had to reconcile our design desires and capabilities with the story we were developing and trying to convey.

This challenge became much more apparent because we were working under very different constraints, but meeting with various people and getting expertise on multiple aspects of the implementation really helped to solidify the ultimately product that we created.

Our Story

Our Story

- 1. Understanding the issue:** Our goal was to see interesting trends in economic data. International events have significant economic impact on individual nations, and these event effects were what we were interested in portraying via interesting visualization.
- 2. Expected Value:** The most important aspect of our visualization was to preserve the intuitiveness of understanding, and we felt that these graphs should provide a richer understanding of the economic data surrounding international effects.
- 3. Final Product:** We ultimately created an interactive visualization to see the economic effects of these international events, grouping the countries in each event by the level of affect that the event had on economic growth, with GDP per capita being the most prominent growth factor displayed in our visualization.

Finished Project

Finished Project

Screenshots || Overall

Growing Globally

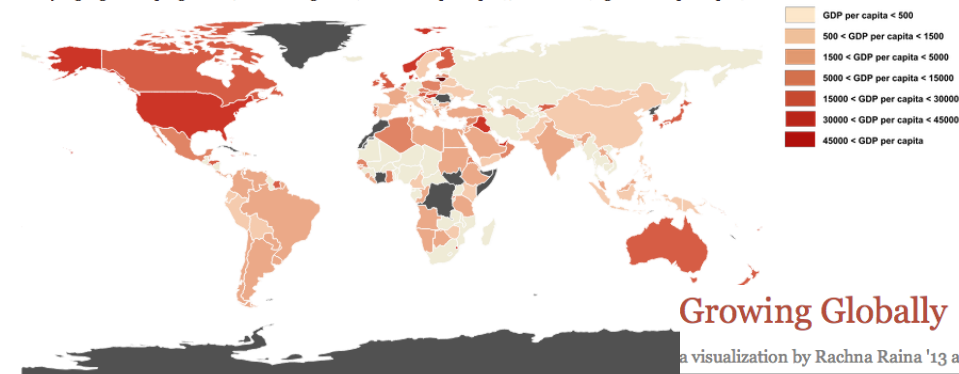
a visualization by Rachna Raina '13 and Karen Xiao '14

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Global GDP per capita and Unemployment Data: 2002

Display visualization for year:

This map is a visualization of global GDP trends over time. We hoped to be able to observed, primarily within OECD nations, the trend of GDP concentrations over the 15 years from 1995 - 2010. The value of this trend understanding comes from being able to see which nations have developed more rapidly comparatively, and if there are concentrations of development amongst any of these nations. The color progression visually highlights the progression, from the lightest (lowest GDP per capita), to darkest (highest GDP per capita).



Worldwide Events

- 1998: Aftermath of the Asian Tiger Crisis
- 2000: Y2K
- 2001: Dot-com Bubble
- 2002: 9/11 Aftermath
- 2009: Global Financial Crisis Unraveling

[Clear](#)

Growing Globally

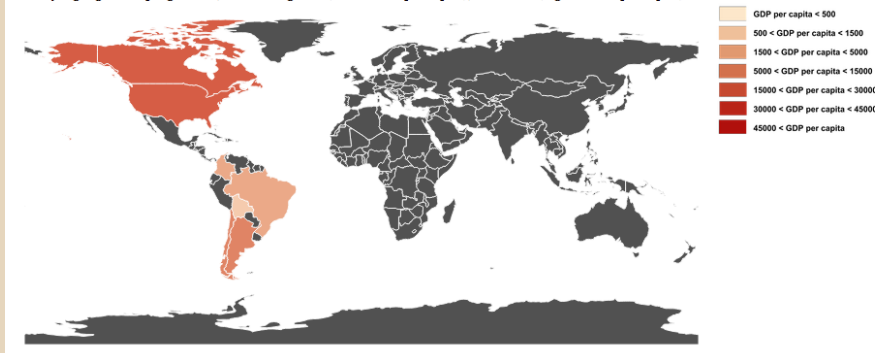
a visualization by Rachna Raina '13 and Karen Xiao '14

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Global GDP per capita and Unemployment Data: 1995

Display visualization for year:

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Worldwide Events

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2002: 9/11 Aftermath

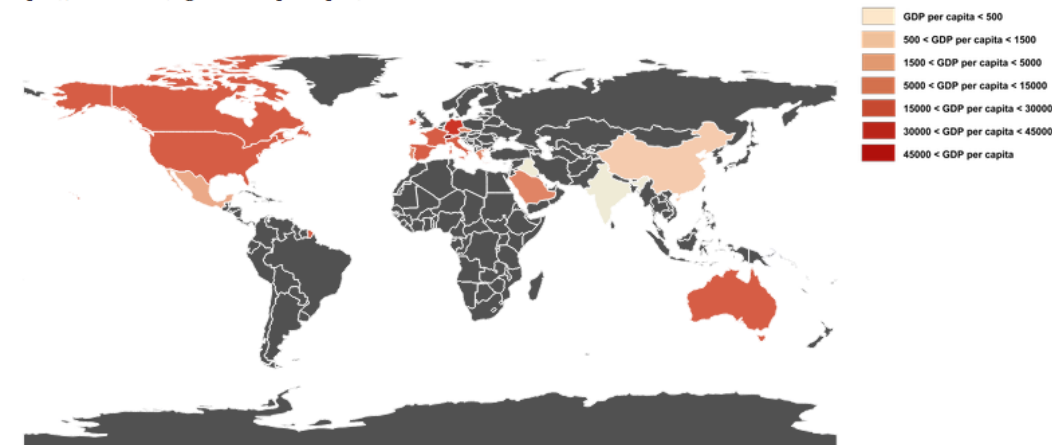
September 11, 2001, was the date in which two plane were crashed by terrorists into the World Trade Center buildings in New York, New York. Because this is one of the financial centers of the world, the economic effect was devastating and long-lasting, but the aftermath in the immediately following the attacks was very apparent in the United States and nations with whom it worked very closely.

Finished Project

Screenshots || Graph

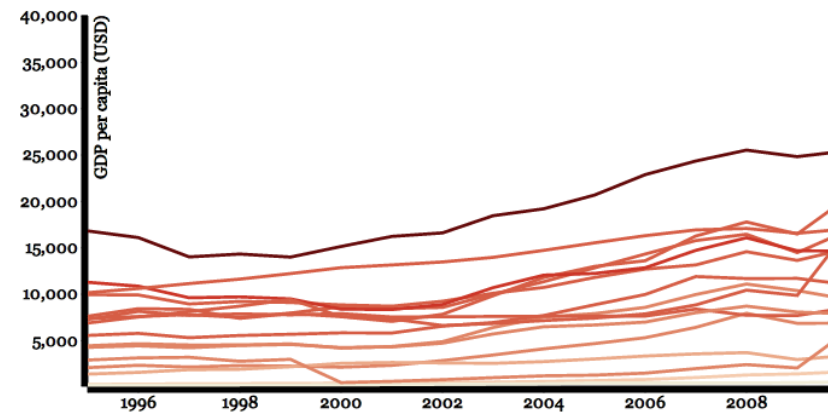
Global GDP per capita and Unemployment Data: 1995 Display visualization for year: 2009

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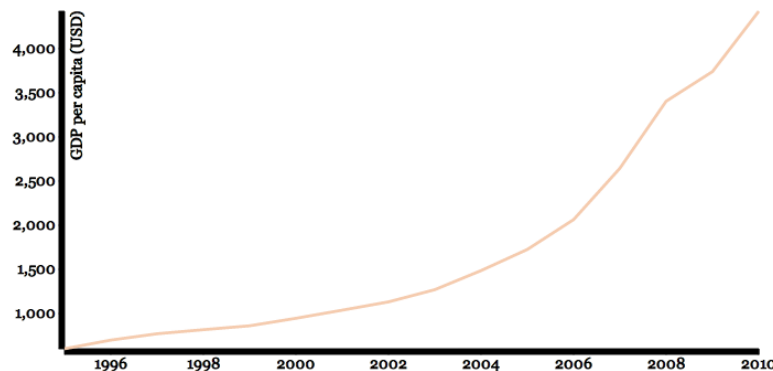
Data from years 1995-2010

The graph displayed below is intended to allow for an understanding of growth trends over time for an individual nation (GDP per capita or unemployment) and multiple nations (GDP per capita for particular events).



Data from years 1995-2010: CHINA

The graph displayed below is intended to allow for an understanding of growth trends over time for an individual nation (in GDP per capita or unemployment) and multiple nations (GDP per capita for particular events).



Select growth variable:

- ☒ GDP per capita
- ☐ Unemployment Rate

Finished Project

Logistics and Further Study

We worked together quite handily on this project -- each focusing on our strengths. For Rachna this primarily consisted of visual and implementation design and decision-making on the data she collected, as well as documenting and constructing the process and story. Karen focused more heavily on implementation via D3, as this is where our strengths lie.

In future study, causation would be a lofty, though interesting goal to look at. These visualizations are not powerful enough to give an indication of such an analysis, but we would hope to develop such a strong model at some point with this data.

Conclusion | | Our Main Delta

Conclusion || Our Main Delta

Our purpose in this project was to show main trends in data with relation to GDP per capita surrounding major international events. We thought that the value of geographic preservation was important for displaying the relationships amongst nations, along with unemployment rate supplementation, while within a nation the relative magnitudes were more crucial to see the upward and downward trends. This dictated the visualizations we chose to pursue, and we certainly enjoyed looking at this data more closely while learning more about D3 visualizations.

Our main changes included:

1. Reorganizing our data bins
2. Including more countries and more variables through significant data cleaning and collection
3. Completely overhauling our story and the accompanying visualizations
4. Making our map interactive (clickable)