

Visualizing Wealth and Personal Finance  
A XULA Vizlab workshop using Google Sheets

- 0) Get today's data at: [bit.ly/viz-wpf](https://bit.ly/viz-wpf)
- a. Log in to your **google account**, right click the data file ("**Visualizing Wealth and Personal Finance**") and select "Create a copy"
  - b. This will create a copy of each datafile in your own google drive. Since you copied the file, you will have full edit access – it's your file.
  - c. Go to your google drive and verify the files have been copied. If you want to organize into a new folder or rename, do so now. **Renaming or moving later can cause issues when interacting with other programs!**
  - d. Open the file in your own Google Drive. You should be able to edit the file.
- 1) Where does my money go?
- a. Examine the 4 rows of data within the file – what information are we looking at?
  - b. Select the first two columns of data (the titles and "Joe"), and go to "Insert" > "Chart"
  - c. A bar chart will appear
    - i. Change the chart type to "waterfall" – it's in the "other" options
    - ii. Under "customize," choose "series" and select the option "data labels"
    - iii. What does this graph illustrate?
  - d. Select the first column (titles) and the column for "Sally." Create the same visualization.
    - i. **HINT:** *Selecting a cell, holding SHIFT and clicking down a row will grab all cells of that row. Holding CONTROL (Command on a mac) and clicking will add a cell to your selection without the cells in between.*
    - ii. Compare the differences in Sally's and Joes budget.
      1. **Q: Which values stand out?**
      2. **Q: Which budget makes more sense?**
  - e. Now fill in a row of data with your own hypothetical (but reality-based) numbers.
    - i. Try to use the same categories and do at least once using the \$3,500 monthly income.
    - ii. **Q: What do people do with the "extra money" ("subtotal" by default here)**
- 2) The power of investing
- a. Move on to the next tab – "2) The power of investing." Don't delete the blank chart labeled "No data" on this sheet – it will populate.
  - b. Calculate the amount added in year 1 for each column heading. Don't take into account interest yet (to keep things simple, we will assume interest is awarded at the start of each subsequent year).
  - c. For row 2, we will need to calculate the new balance. This will be the sum of:
    - i. The interest awarded on the previous year ( $= \text{Balance} * (1 + \text{int\_rate})$ )
    - ii. The amount we put into the account (which you calculated in year 1)
  - d. Put this into the cell for year 2 under 100/month.
    - i. **Be sure to reference cells within the sheet!** To do this, select the cell you will enter into, and start your entry with an equals sign  $\rightarrow =$
    - ii. This tells google sheets to expect a formula, not a specific number
    - iii. Make sure your answer makes sense.
    - iv. Repeat for the other columns
    - v. The graph should begin to fill out, make sure this makes sense too

- e. If your row 2 calculation makes sense, you should be able to copy-paste your year 2 data all the way down through year 20!
- f. What if we want to contribute aggressively for 10 years, but then stop making contributions for the next 10?
  - i. Create a new column titled "1000/month, stopping after 10y)
  - ii. Start by reproducing the "1000/month" column through year 10
  - iii. Edit the formula for year 11 to account for the fact that you will stop putting in new money
  - iv. Copy this formula through year 20
- g. Double-click the graph – graph editor should appear
  - i. Go to Setup > Series
  - ii. Under add series, click the boxes logo
  - iii. Select this new data column (with the title) and it should appear in the graph.
- h. **Q: What lessons can you learn about the time-value of money from this example?**
- i. **Q: How much do you think is needed to retire?**

3) Always pay your credit cards! (aka. Joe is back)

- a. Begin filling in month 1 with the following data: \$1000 charged, \$25 paid
  - i. Calculate the balance remaining on the card (Balance column) using these 2 cells **(remember to reference the cells so we can copy down the sheet!)**
  - ii. For "Total spent" simply reference "New charges (this month)" for now
  - iii. Under "Total paid" simply reference "He pays (this month)" for now
  - iv. For Difference, take the difference between ("Total spent" and "Total paid")
  - v. For interest charged, enter 0 (we will assess interest the same as in the investment sheet)
- b. Now fill in month 2 (which will look more different!). **Unless the previous month is mentioned specifically, use the cell from the month 2 row.**
  - i. Let's assume that for 12 months, Joe continues to charge \$1000 each month and make only \$25 payments.
  - ii. Calculate the balance as (Previous month's balance\*(1+Interest Rate/12) + New charges – payments). Make sure your answer makes sense.
  - iii. Calculate "Total spent" as (amount of "Total spent" from last month + "New charges (this month)" )
  - iv. Calculate "Total paid" as (amount of "Total paid" from last month + "Payment (this month)" )
  - v. Calculate "Difference" as ("Total spent" – "Total paid")
  - vi. Calculate "Interest Charged" as ("Balance" + "Total paid" – "Total Spent")
    - 1. This basically "undoes" the charges and payments compared to the balance, leaving only interest
- c. The graph should begin to populate
- d. Continue this same behavior for 12 months. If done properly, you should be able to copy-paste the "month 2" cells down through "month 12"
  - i. **Q: What do we think of this spending behavior?**
  - ii. **Q: What lines are increasing the fastest?**
  - iii. **Q: After 1 year, how much does Joe owe on this card?**
- e. Joe starts to get worried after 1 year, and begins to make \$1200 payments, continuing to spend \$1000 on the card.

- i. Fill in this info for the first 2 columns in month 13 and copy through month 24.
  - ii. The formulas you calculated for the other columns should copy-paste down through month 24, continuing the lines in the graph – make sure it looks right.
  - iii. Q: How much progress is Joe making on his debt?**
  - iv. Q: After 2 years, how much does Joe owe?**
- f. Joe is now very worried, and begins to make payments of \$1500 – assume he still puts on \$1000 in charges.
  - i. Fill this info through 36 months.
  - ii. Q: Assess the pros and cons of Joe’s use through 3 years**
- g. Fill in the info for the remaining months to see what it takes to get Joe out of debt

#### 4) My car is upside down, underwater!

- a. Start with the 5% APR column (in the middle). Fill in the value of the car through 10 years.
  - i. If the car depreciates 20%, this will be  $(0.80 * \text{previous year "Car Value"})$
  - ii. On total Loan, begin to calculate the remaining total value. If the loan is 6 years long, you will pay for 1/6 of the loan each year for 6 years.
- b. Select the 3 columns for 5% APR. Go to Insert > Chart and pick one that represents the data well.
  - i. Q: What does it mean if the total loan amount exceeds the value of the car?**
  - ii. Q: What does this mean if you sell the car?**
  - iii. Q: What does this mean if the car gets wrecked?**
- c. Create graphs for the 0% and 10% APR columns. Compare the results.

#### 5) Making Sense of Student Loans

- a. The bolded numbers in the heading can be changed and adjust to the entire graph – don’t change them for now
- b. Calculate the remaining principle in year 1 by taking the difference between the annual payment and “Total Debt” from the previous year
- c. Calculate the interest for year 1 by multiplying the remaining principle by the rate – use the value in the row for year 1 (which will let us copy-paste for other years)
- d. Calculate total debt in year 1 by adding “Remaining principle” to “Interest” in year 1.
- e. Copy-paste through 10 years
- f. Select the data and make a graph of the “Total Debt” column
  - i. Change the parameters at the top to see how this changes the length of time to get out of debt!
- g. Q: How long is a reasonable amount of time to carry the student loan debt?**
- h. Q: How much do you need to pay each month on a \$50k loan to get out of debt “reasonably fast”? How about 100k? 250k?**
- i. Q: What salary will you need to make in order to pay this amount each month? Feel free to go back to our week 1 budget page and play with those values, or copy it over to this sheet**

Thank you for attending – please complete the survey at: [www.bit.ly/vizlab-feedback](http://www.bit.ly/vizlab-feedback)

#### Suggested reading:

Sethi, Ramit. *I Will Teach You to Be Rich, Second Edition: No Guilt. No Excuses. No BS. Just a 6-Week Program That Works.* **2019**

Lowry, Erin. *Broke Millennial: Stop Scraping By and Get Your Financial Life Together.* **2017**

Fagan, Chelsea. *The Financial Diet: A Total Beginner's Guide to Getting Good with Money.* **2018**