

# Lab Section 02

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## *Collect some price data*

Google:

*case shiller index saint louis Fed*

and click on the top link. If all goes well you should land in the “FRED” database at the Federal Reserve Bank of Saint Louis, which is a nice repository of macro and financial economics data. Click on Download an Excel spreadsheet.

Using the “Geographies” menu on the left side, find the index for the city of Phoenix. Create a worksheet with the price index in this city, from July 2002 until July 2016.

By what percentage did house prices increase from 2002 to the peak of the housing bubble? By what percentage did house price decline from the peak of the bubble to the subsequent trough? By what percentage did house prices increase/decrease over the entire time period?

Now download the case Shiller index for your favorite city. Is the pattern as pronounced as for Phoenix AZ?

Now go to [www.zillow.com](http://www.zillow.com) and find one recently sold single family house you’d like in Phoenix (show a picture of the house on your slides!). Try to pick a house that sold multiple times during the 2002-2016 time period. Using the Case Shiller house price index and the selling price of the property, generate an approximate time series for the price of this house, every month from July 2002 to July 2016. Compare the approximate house price series with the actual transaction prices shown in Zillow. How accurate is your approximation? What could explain the discrepancies you observe?

## *Collect some interest rate data*

Google “fred saint louis” and click on “categories” and then “interest rates

Click on “Treasury Bills”: download monthly data on 3 month Treasury bill for the same time period.

Now go back one page and click on “Mortgage rates”: download monthly data on the 30-years conventional mortgage rate for the same time period.

## *Create an amortization table for a fixed rate mortgage*

Suppose you buy the house in July 2002. You put 35% down, and take on a fixed rate, 30-years, mortgage. Create the amortization table for this mortgage, from July 2002 to June 2032. What is your outstanding balance in June 2016? Did the amortization part of your payment go up or down over time? Why? What about the interest part? Why?

Now it is June 2016 and you are thinking about refinancing, at the current rate for the remaining 16 years of the loan. Is it a good idea? Create an amortization table for this new loan. What would be an estimate of the dollar (present) value of refinancing your loan?

### *Create an amortization table for a floating rate mortgage*

Suppose you buy the same house, also putting 35% down, but with an adjustable rate 30 year, mortgage. The interest rate on the mortgage is re-set *every month*, according to the following formula:

3 month Treasury bill rate + 3.5 %

Create an amortization table for this floating rate mortgage, from July 2002 to June 2016. Which of the two mortgages performed the best? Could a homebuyer have anticipated this result when taking on the first mortgage in July 2002? Under what interest rate scenario would you have obtained the opposite result?

### *Buying at another time*

Suppose you buy the house in July 2006. The mortgage company offers you a mortgage with a high loan to value and “negative amortization”. You only have to put down 10%. For the first year, you do not have to make any payment, but your liability grows at the Treasury Bill rate + 2%. After a year, your mortgage is converted to a conventional 29 year fixed rate mortgage, at the prevailing 30 year rate + 1%.

Create an amortization table for the house. Create a plot showing the evolution of the mortgage balance and of the house price. Where in the graph do you see the effect of “negative amortization”? Are you “under water” on your mortgage at any point in time between January 2006 and June 2016?