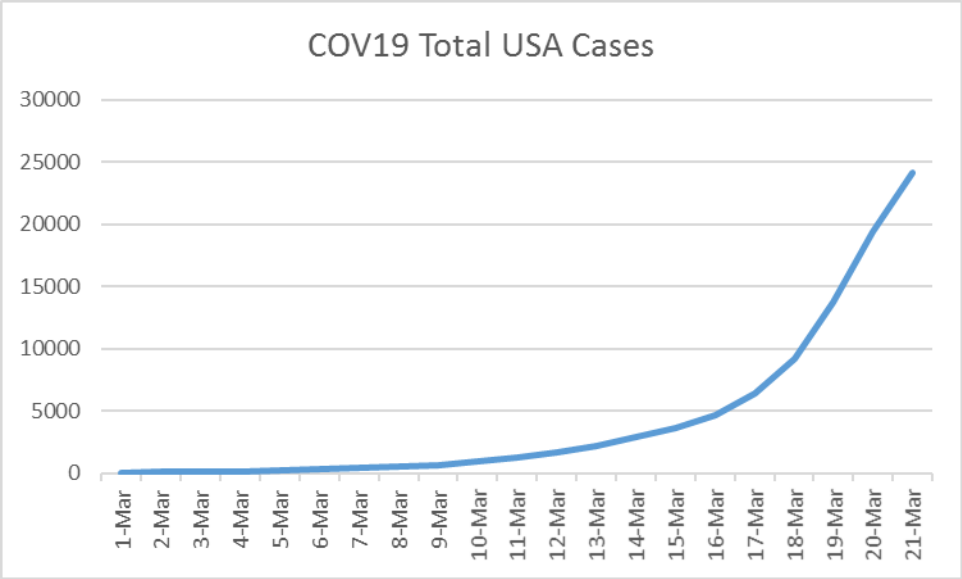
Forecasting in the Time of COV19

Once we all agree on our vital role in this crisis—social distancing—we can move onto the subject of our course, macroeconomic forecasting. Quite sadly, COV19, in an unprecedented fashion is the dominant issue for all of our forecasting responsibilities. Why? The attached article by Gourinchas makes it quite clear. What is social distancing? It means we are *purposefully trying to get the population to cancel trips, not go to the movies or restaurants, not go to car dealerships.* So we are purposefully collapsing demand. Companies are seeing their revenues—the money they collect—collapse. So they must slash costs. And 70% of company costs are labor costs. That means companies are now firing at an unprecedented rate.

Carefully read the attached article. I think he gets two thirds of the way there. What is he missing? There is a third curve. The curve capturing financial market pressures and bankruptcy risks. A plunge in revenue, if you have limited interest payments, you can survive. But a plunge if you are highly indebted, leads to bankruptcies, as you should have learned from reading (at least skimming) my book.

So we can boil our efforts down to focusing on three curves. The COV19 exponential growth curve. The U.S. unemployment rate. The Spread between risky and risk free long rates.

The government must accept a surge, short run for U3, so as to push down COV19. It also needs to try and suppress the surge in risk spreads, thereby limiting bankruptcies.
Here are some charts:



Over the past 7 days, this chart reflects an exponential growth rate of 1.35% per day.
We can write the following equation:
$n_2 = n_1$ X 1.35% The chart hits home how insanely fast numbers grow, with such a growth rate.
Where will we be in one month, if that growth rate persists? Do the math to see that such an outcome results in 2/3's of the U.S. population having experienced the disease.

Does the fact that the number is rising 35% per day make it clear that cases are growing 35% per day?

No. The U.S. governmental response to this crisis, over its first month, was pretty close to the worst of any developed economy in the world:
https://www.bradford-delong.com/2020/03/the-trump-administration-has-made-america-1-worst-in-the-world-at-coronavirus-response.html

One of our biggest blunders was failing to create a large supply of test kits. The near complete lack of testing, through early March, means that the known total case level, estimated to be 1300 on March 10th, wildly underestimated the actual number of COV19 infected people.

We can prove that the early numbers are crazy low, by simply looking at COV19 deaths. Deaths, obviously, come sometime after infection. Let us assume that the death total for March 21st, 300, reflects the total death rate for all those infected 10 days earlier, on March 11th.

The March 11th number for total known COV19 cases is 1300. That would mean that 300 of the 1300 died, for a mortality rate of 23%. That is absurd. Much more likely? Our wild failure to test left us ignorant of how many had the disease. If the mortality rate is 2.3%--23 times worse than the flu—then the actual level of cases on March 10th is around 13,000. If the death rate is only 10 times the flu, 1%, then the actual level of cases on March 10th was 30,000.

Over the past week testing has begun in earnest. That means the 35% growth rate reflects both the large growth in infections and the large growth in testing.

We can use the number of deaths to back into some guess about how many people were infected, perhaps 10 days previously. Assume the following:

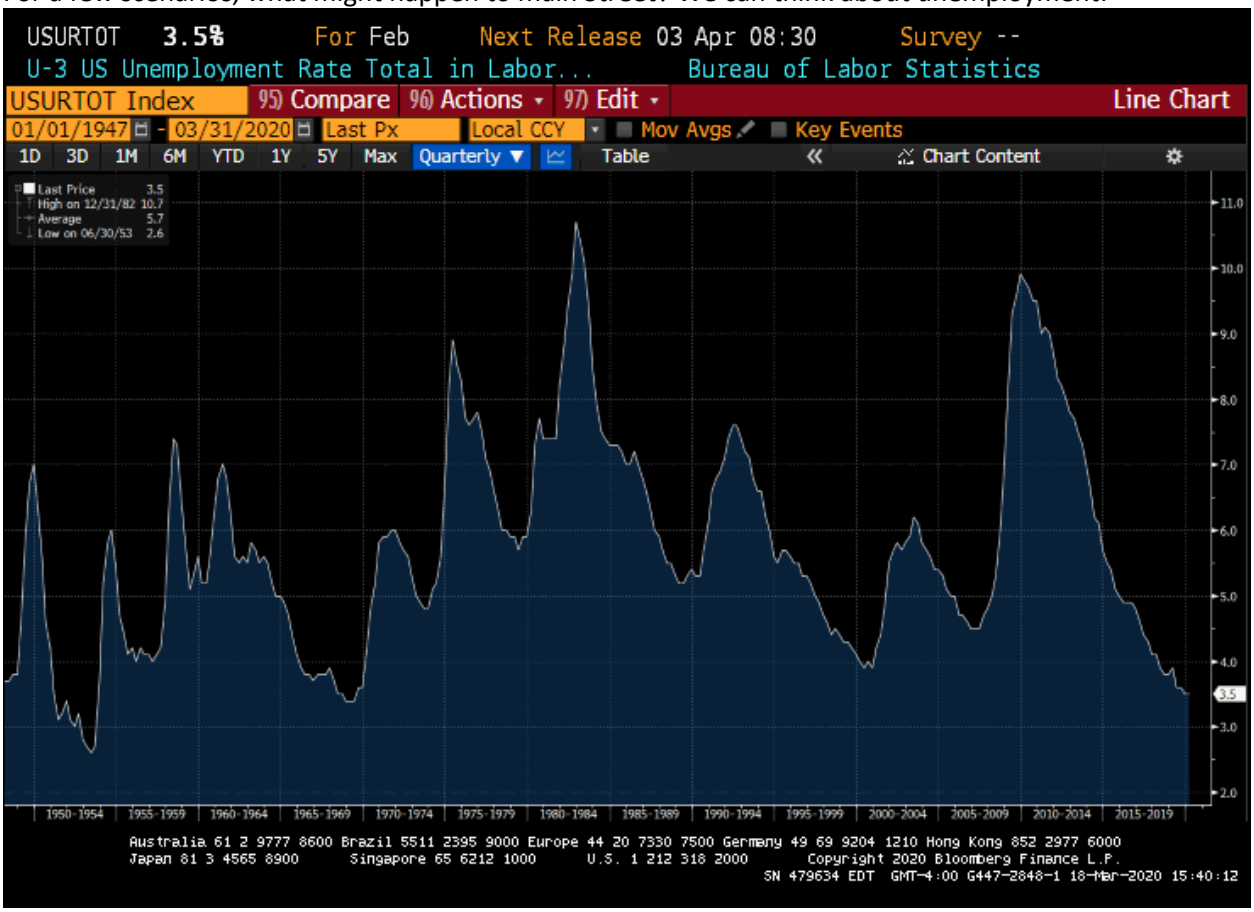
$$d_t = c_{t-10} \times m$$

d ≡ number of deaths c ≡ number of cases m ≡ mortality rate (% of cases that die)

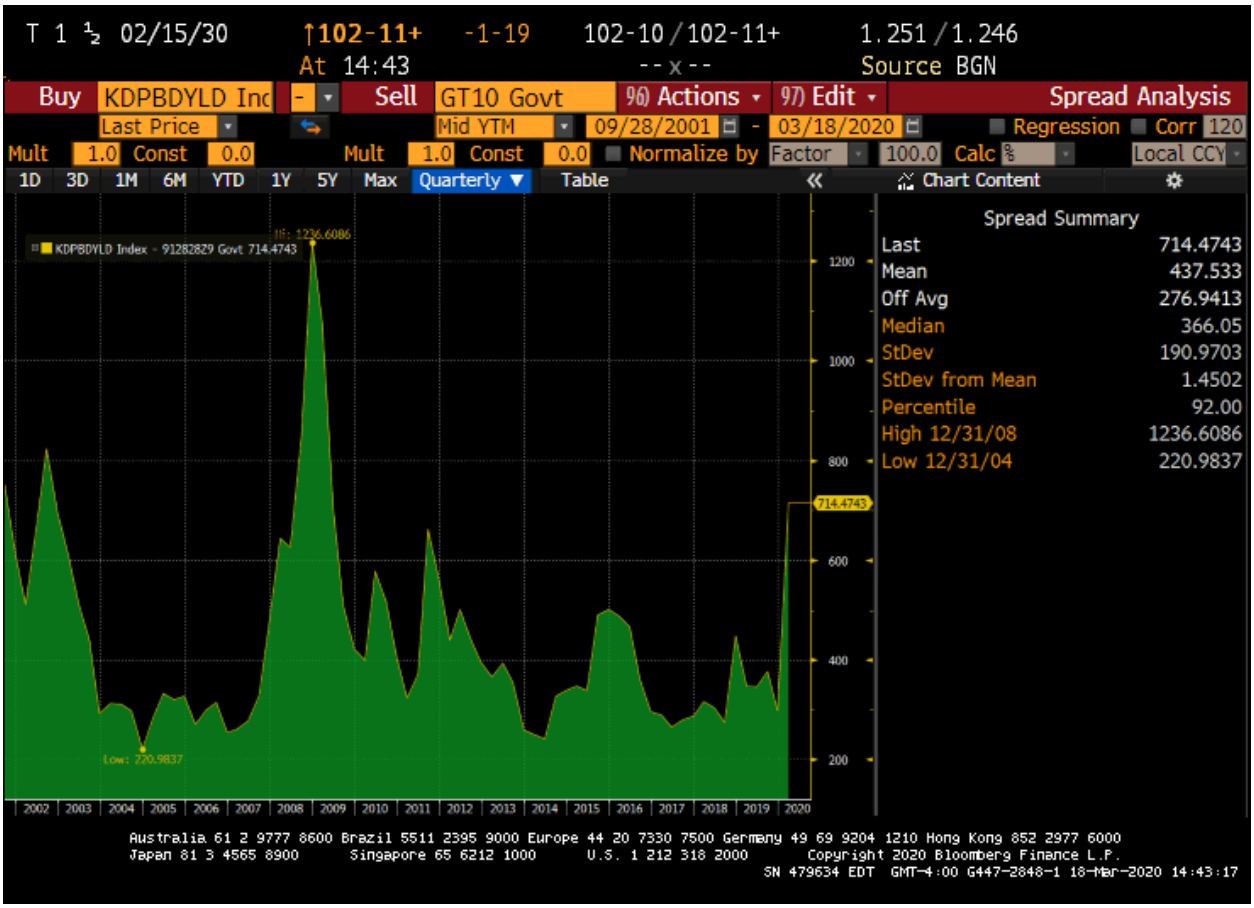
I have attached a spreadsheet. It provides you with deaths through 3/20. It also provides 3 columns, each with a specified mortality rate. For each of the three mortality rates estimate the actual number of cases implied by the deaths.

Think about what might happen to infection rates, death rates, and insistence on social distancing.

For a few scenarios, what might happen to main Street? We can think about unemployment:



Now how about risk spreads and the economy? Check out this chart and be ready to speak about danger zones:



See you on TV on Wednesday.