

A glimpse of the development of IT companies

Sen Zhou

Apr. 25 2014

1 Introduction

Google, Apple, Yahoo, IBM, Facebook, Twitter, AT&T... this list can go longer and longer. Yes, they are all IT companies and they represent new trends, science and technology. Some of them are new, else are old. Some of them are developing and some seem "expired". And a lot of them were once on top of the tides. So let us take a look at stock prices of all those companies and make comparison among them and try to summarize some conclusions.

2 Questions of Interest

1. How do the stock prices reflect the development of the company?
2. How do the stock prices reflect the development of the whole market through those representative companies?
3. What happened to those "expired" companies?
4. Any historical moments corresponding to big changes in the stock prices?

3 Data

There are many resources containing historical prices and volume of stocks, like google finance and yahoo finance. Inside R, there is also a package called “quantmod” which people use to do quantitative finance. They are almost the same with some differences.

When we use `getSymbols` to get the data from websites, like google and yahoo, we would like to get the data from the very beginning. But we would like to set a general “early” start date for every stock. This way works for yahoo websites but have problems for google website. It might have something to do with how those websites store their data.

Remark:

And yahoo stores their data with splits indicated. (So they have the original prices of every stock before adjusting for the splits). And then it has an adjusted price based on the split and dividends.(different from just the adjust for splits) Even NASDAQ website will save their ten years data after adjust the splits. Google seems to have a similar way to NASDAQ and saves the data after adjust the splits. So if we get the data from Google, then we cannot use `getSplits`.

Another way is just go and download csv files from websites and read csv files into R. Further, we can write our own program functions similar to `getSymbol` to read the data form the website. In this project, we use the package “quantmod”. And we pick IBM, Intel, Apple, Microsoft, Yahoo, Amazon, Google, Facebook and Twitter as representatives.

Remark:

Now after google did its first split, we cannot find the data for google , even if on NASDAQ website. If the prices just need to be divided by 2, then it should not take such a long time for google, yahoo, nasdaq to update. So I don’t know why.

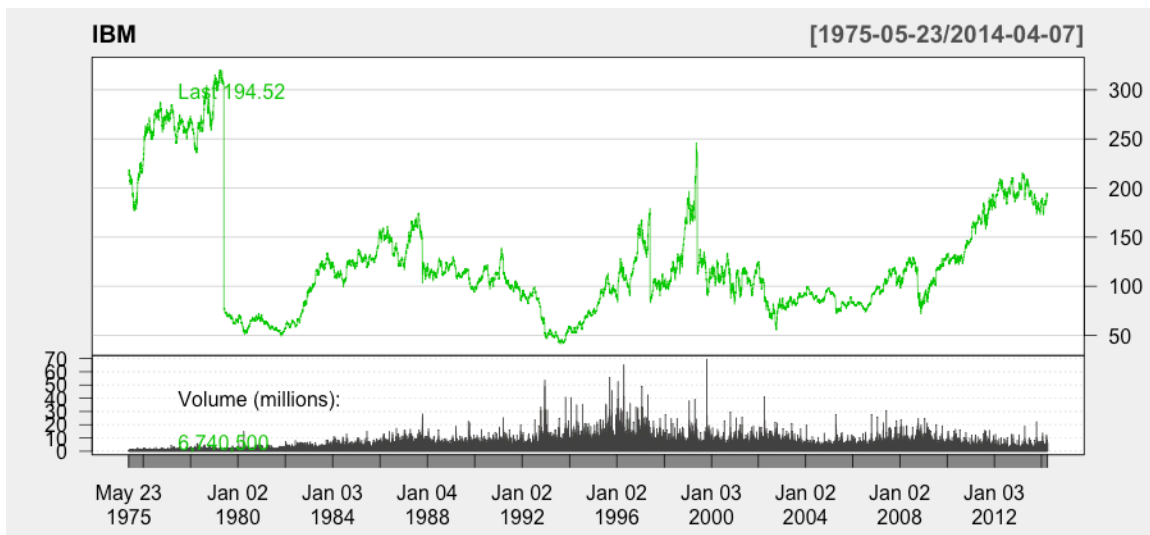
4 Explorations

First let us take a very general look at the historical prices of those companies’ stocks.

3.1 BIG Blue: IBM

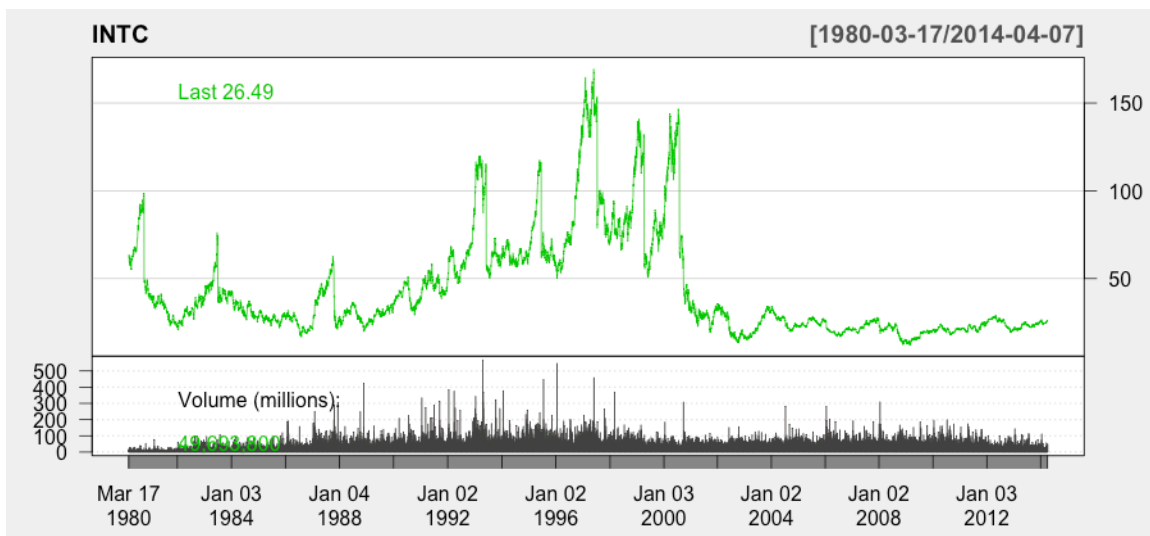
From the Figure, we can see apparently that there are two big drops around the year 1980

and 2000. It seems that 1992 is also an important year. IBM goes through a lot of years and is the oldest IT company among the list.



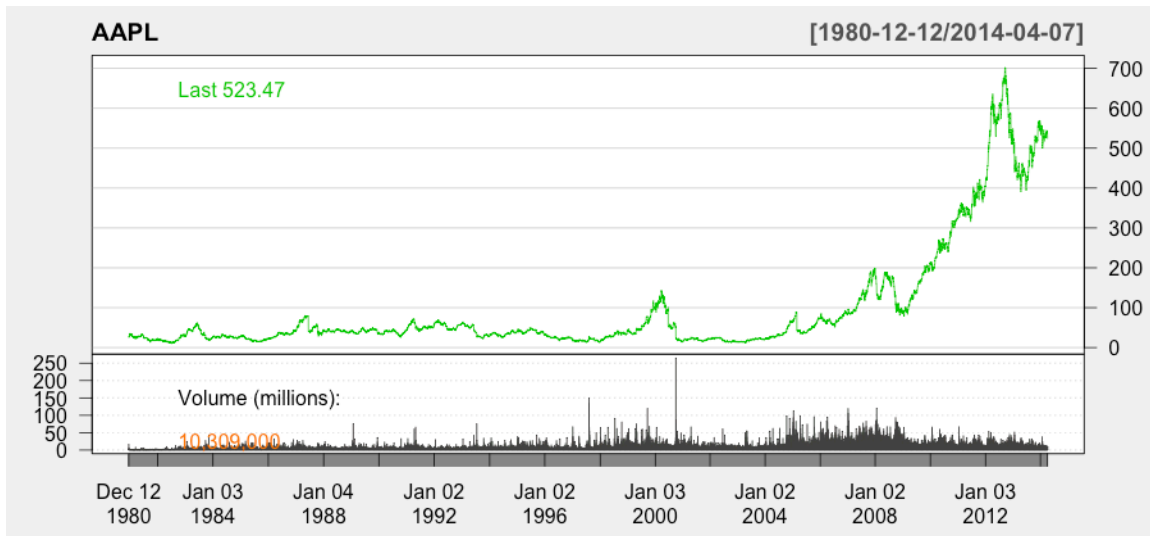
3.2 Leap ahead: Intel

From the Figure, we can see that Intel went high and low several times. After 2000, the development of Intel seems “peaceful”.



3.3 Think different: Apple

From the figure, we can see that Apple seems to have a steady development. There are three drops around 2000, 2008 and 2012.



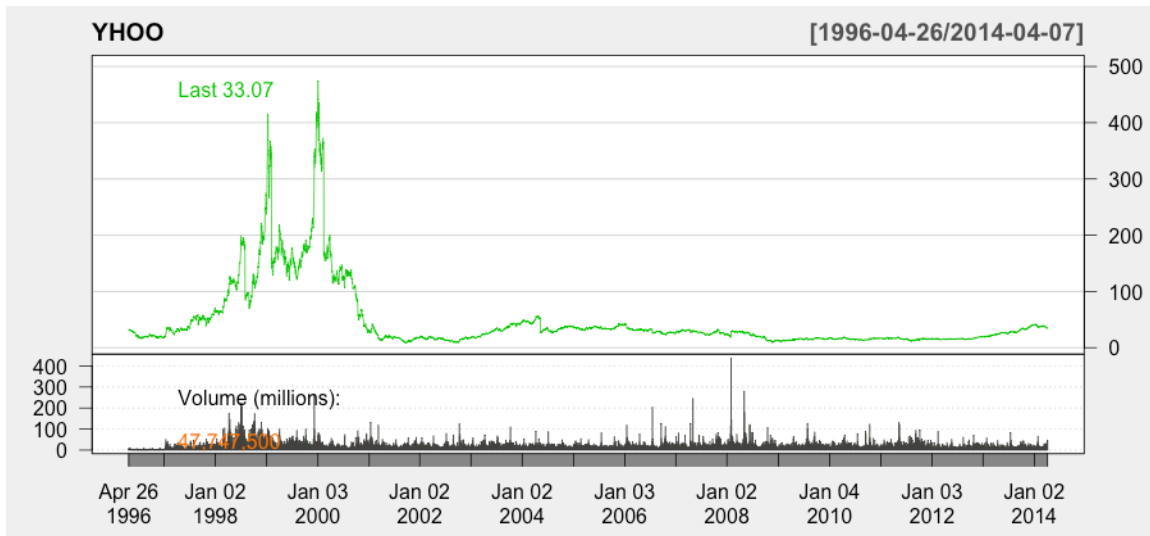
3.4 Roman Empire: Microsoft

From the figure, we can see that Microsoft seems to have an “excited” development before 2004. Then it goes a “flat” way.



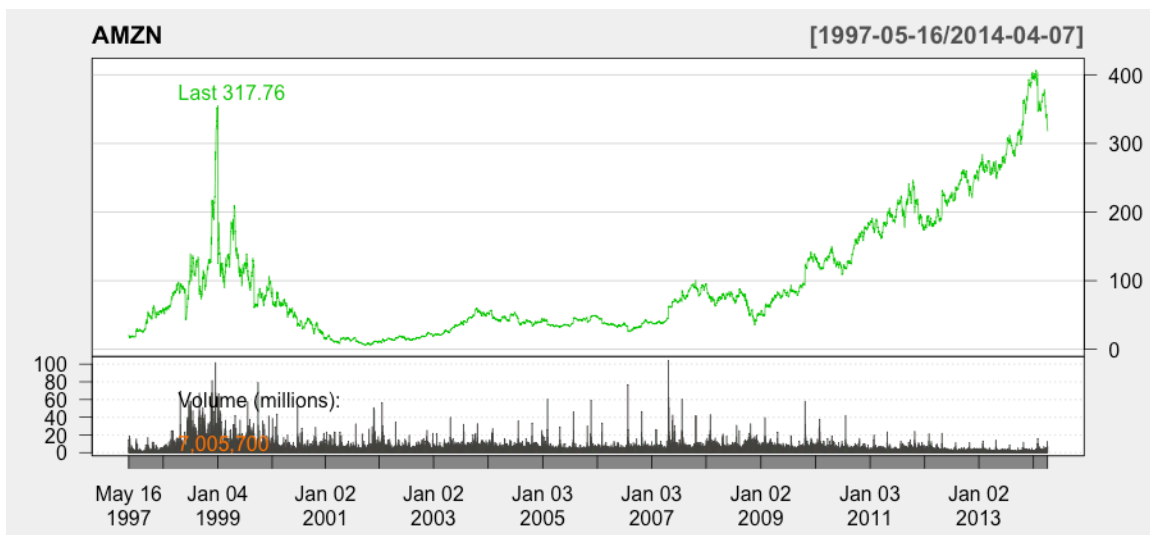
3.5 Do you: Yahoo!

From the figure, we can see that Yahoo has two peaks. One is around 1999 and another is around 2000. Later it seems “expired”.



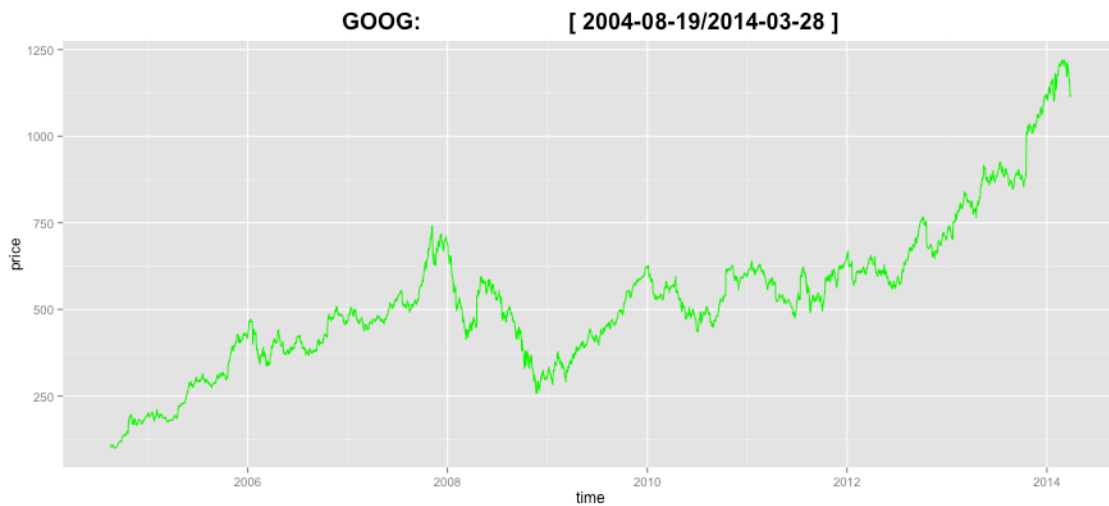
3.6 ...and You're Done: Amazon

From the figure, we can see that Amazon has one peak around 1999. Later it went through almost 10 years flat area and now it is peaking up again.



3.7 Don't be evil: Google

From the figure, we can see that Google reached a peak and turned the direction around 2008. Then a little bounce followed by another drop. Later it took almost 5 years for Google to beat its own record again and drove all the way up.



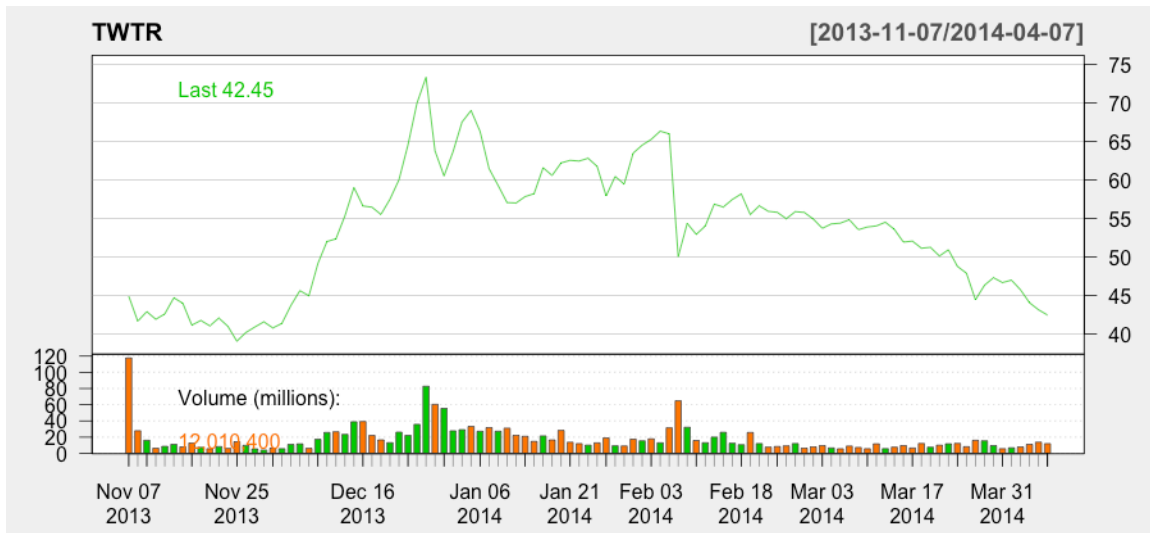
3.8 Be connected: Facebook

From the figure, we can see that Facebook had a hard beginning but later a good development.



3.9 Yours to discover: Twitter

From the figure, we can see that Twitter already went through a roller coaster within a short time.



History:

Let us refer to the history.

1. 1987

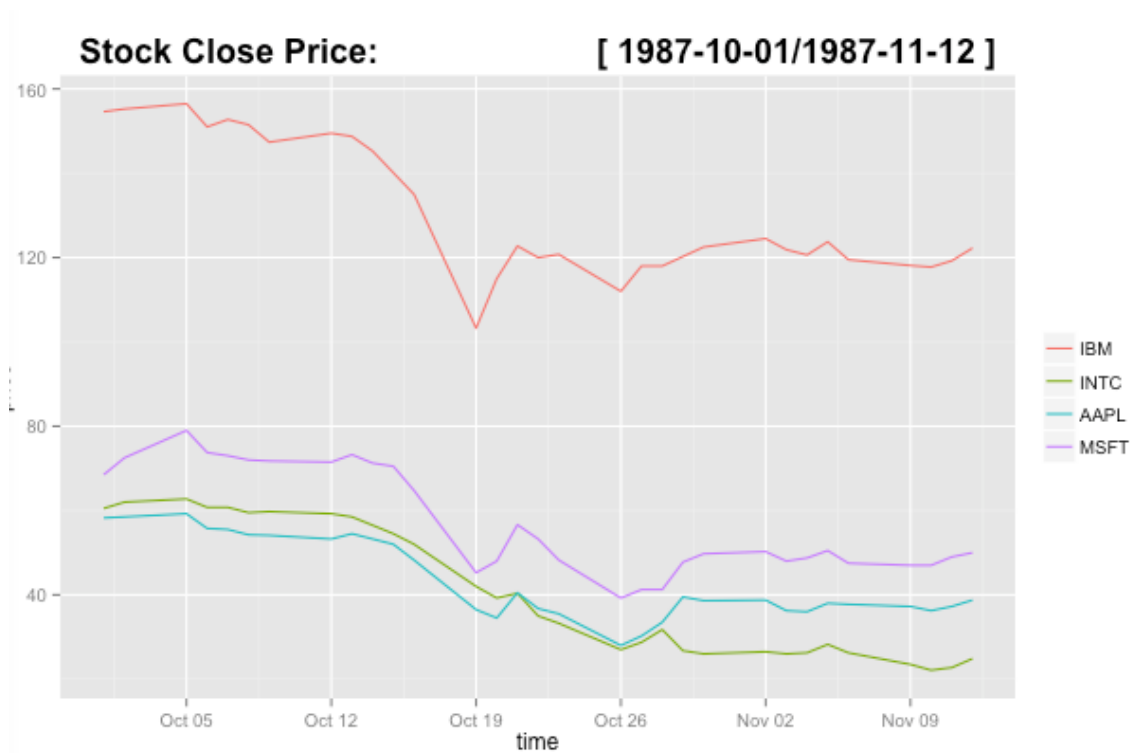
1987/10/19 Black Monday, when stock markets around the world crashed, shedding a huge value in a very short time. The crash began in Hong Kong and spread west to Europe, hitting the United States after other markets had already declined by a significant margin. The Dow Jones Industrial Average (DJIA) dropped by 508 points to 1738.74 (22.61%).

The Black Monday decline was the largest one-day percentage decline in the Dow Jones.

Among our list, there are only four companies went through this moment:

IBM: 1975-05-23 Intel: 1980-03-17 Apple: 1980-12-12 Microsoft: 1986-03-13

We will use the shiny app to help us zoom the graph and observe the data.

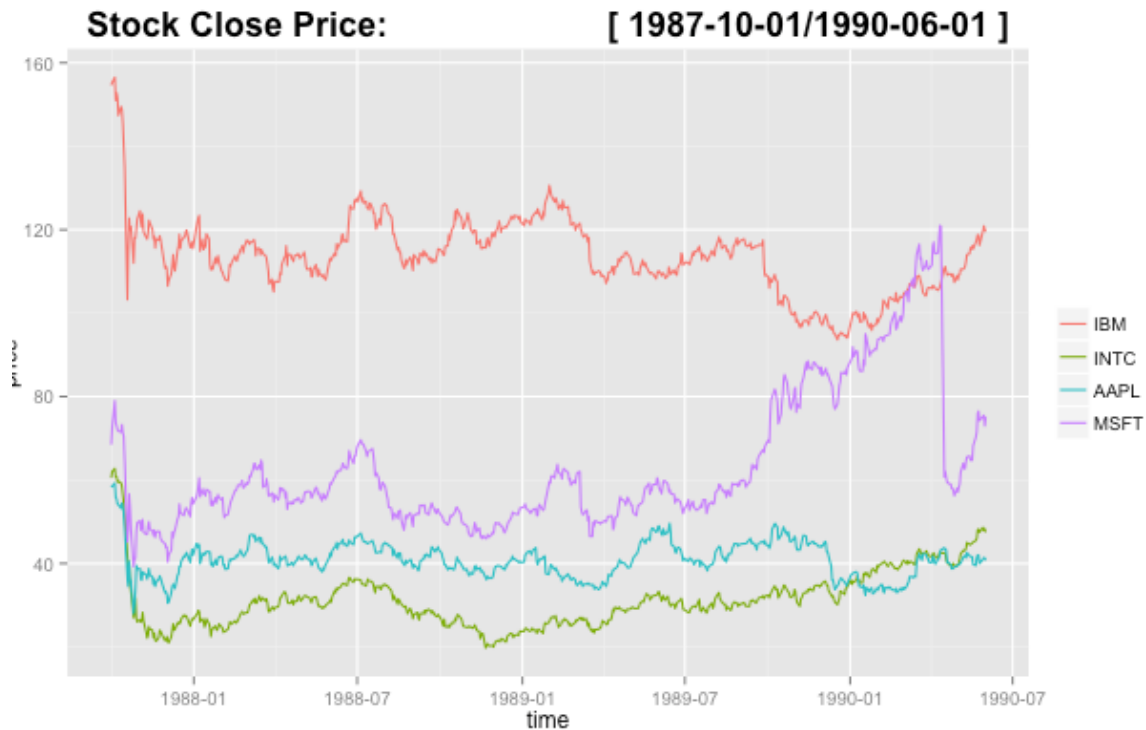


We can see that all of the four companies suffered from the crisis.

```
> IBM[index(IBM)=="1987-10-19",]
```

	IBM.Open	IBM.High	IBM.Low	IBM.Close	IBM.Volume	IBM.Adjusted
1987-10-19	135	138	100	103.25	25497600	15.5

A drop from 135 to 103.25, that is $(135-103.25)/135 = 23.5\%$



We pick the time point whenever one of the four companies' stock prices passed its value before the drop as the signal of recovery. Then it took more than two years for those companies to recover. And from the graph we can see another thing that Microsoft developed and its stock prices overpassed IBM's.

2. 2000

The dot-com bubble was a historic speculative bubble covering roughly 1997–2000 (with a climax on March 10, 2000, with the NASDAQ peaking at 5,408.60 in intraday trading before closing at 5,048.62) during which stock markets in industrialized nations saw their equity value rise rapidly from growth in the Internet sector and related fields. While the latter part was a boom and bust cycle, the Internet boom is sometimes meant to refer to the steady commercial growth of the Internet with the advent of the World Wide Web, as exemplified by the first release of the Mosaic web browser in 1993, and continuing through the 1990s.

Besides those four old companies, now we have two more joined the list.

They are:

IBM: 1975-05-23 Intel: 1980-03-17 Apple: 1980-12-12

Microsoft: 1986-03-13 Yahoo: 1996-04-12 AMZN: 1997-05-16

Here we ass some historical events:

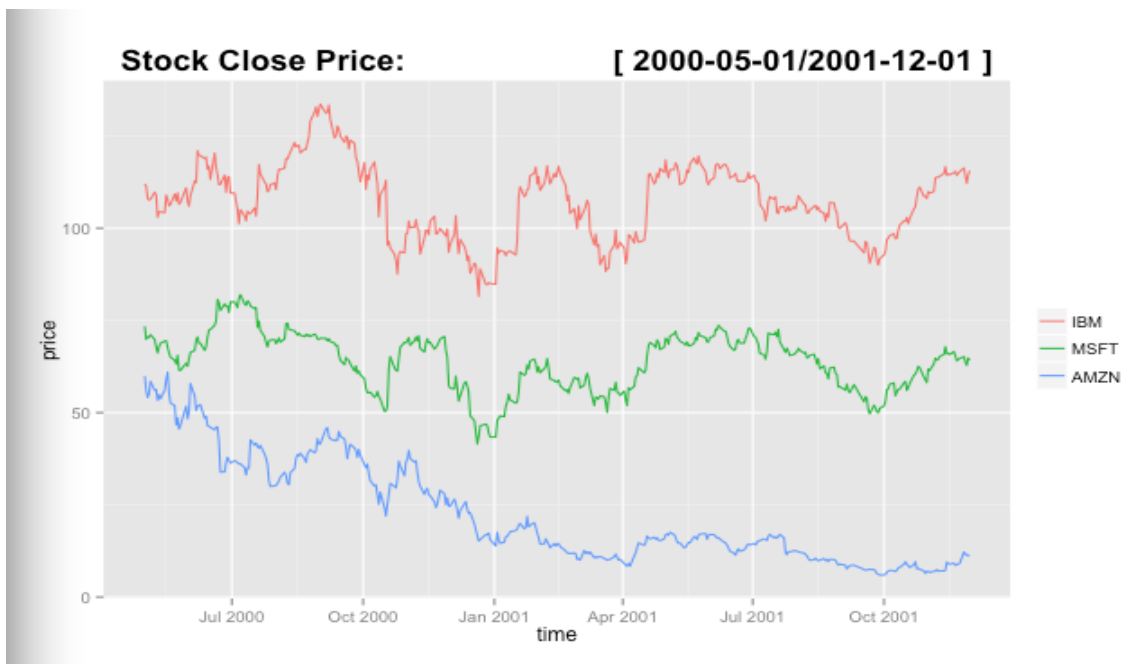
Biggest percentage drops (largest one-day percentage losses in market cap among S&P 500 stocks, for 2000)			
Company	Drop (% of market cap)	Date	Dollars (in billions)
Apple Computer (AAPL)	(51.9)%	09/29	\$9.01
Parametric Technology (PMTIC)	(49.0)	04/03	2.85
Citrix Systems (CTXS)	(46.0)	06/12	3.52
American Power Conversion (APCC)	(44.5)	07/28	4.02
Computer Associates (CA)	(42.5)	07/05	12.85
Compuware (CPWR)	(40.5)	04/12	2.94
BMC Software (BMCS)	(40.0)	07/05	3.50
Cabletron Systems (CS)	(39.5)	03/30	3.47
Novell (NOVL)	(39.5)	05/03	2.25
Unum Provident (UNM)	(39.4)	02/10	2.43
Source: Baseline, Jan. 1 through Oct. 3, 2000			

Biggest dollar drops (largest one-day dollar losses in market cap among S&P 500 stocks, for 2000)			
Company	Drop (in billions)	Date	Share of market cap
Intel (INTC)	\$90.95	09/22	(22.0)%
Microsoft (MSFT)	64.54	04/24	(15.6)
Lucent Technologies (LU)	48.08	01/07	(21.9)
Eli Lilly (LLY)	37.70	08/09	(30.7)
Procter & Gamble (PG)	35.72	03/07	(31.2)
Cisco Systems (CSCO)	32.93	05/23	(8.5)
Bristol-Myers Squibb (BMY)	29.60	04/19	(23.0)
Oracle (ORCL)	26.79	04/14	(13.1)
Pfizer (PFE)	26.27	07/25	(8.7)
General Electric (GE)	25.28	01/28	(5.4)
Source: Baseline, Jan. 1 through Oct. 3, 2000			

We can see that Intel, Microsoft and Apple all lost much value after the crash of the bubble.

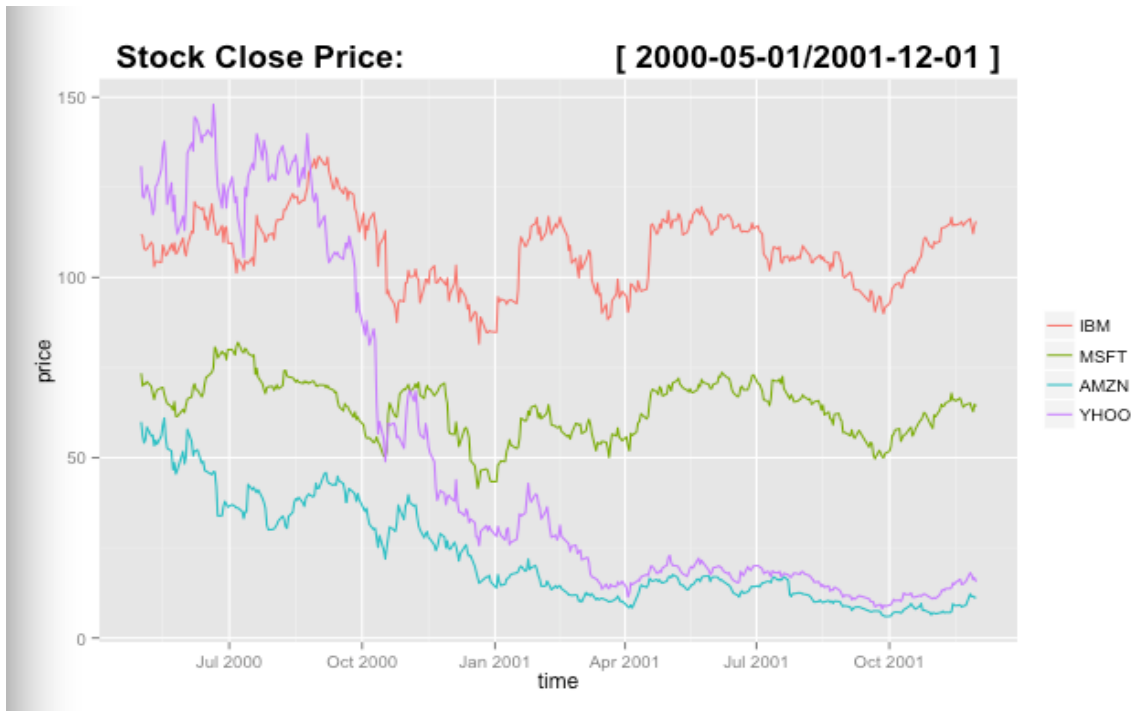


This figure describes how the stock prices of Intel, Apple and Yahoo drops around 2000. There were some drops in the figure corresponding to the splits. But the big trend is decreasing.



IBM, Microsoft and Amazon seemed to have the similar trend during the bubble from

October 2000 to October 2001. It is a big crashed bubble and a lot of dot companies went broken. Those companies seemed to have a little vibration during the severe time. But we should also know that those companies were the ones made to the present. A lot of severely influenced companies are gone today.

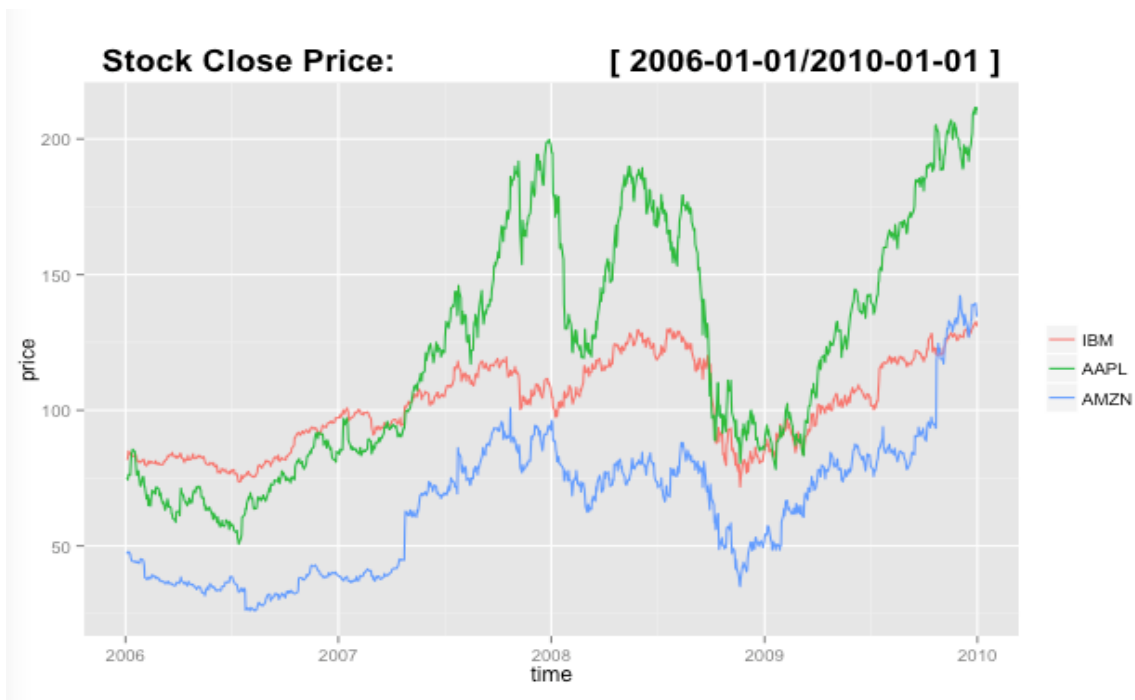


And this figure shows how big Yahoo was during its historical peak. And after this big crash, yahoo never came back to its finest moment.

3. 2008

The financial crisis of 2007–2008 is considered the worst financial crisis since the Great Depression of the 1930s. It resulted in the threat of total collapse of large financial institutions, the bailout of banks by national governments, and downturns in stock markets around the world.

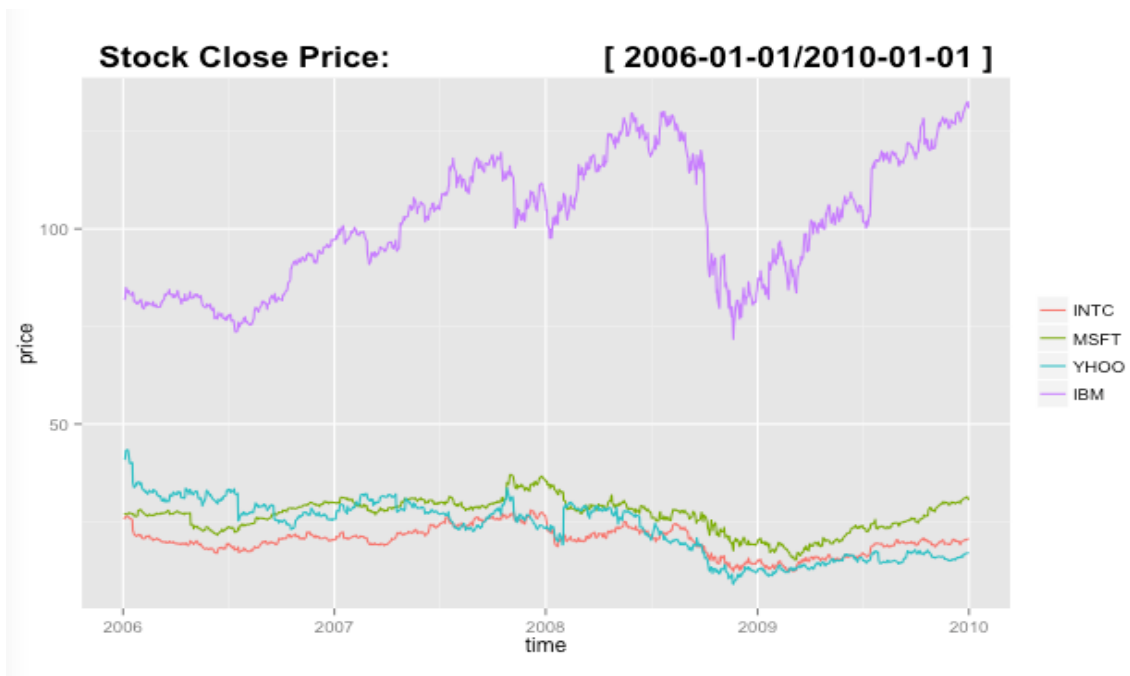
The U.S. stock market peaked in October 2007, when the Dow Jones Industrial Average index exceeded 14,000 points. It then entered a pronounced decline, which accelerated markedly in October 2008. By March 2009, the Dow Jones average had reached a trough of around 6,600.



Around October 2008, the decreasing rate was fast. IBM, Apple and Amazon all suffered from this big crisis.

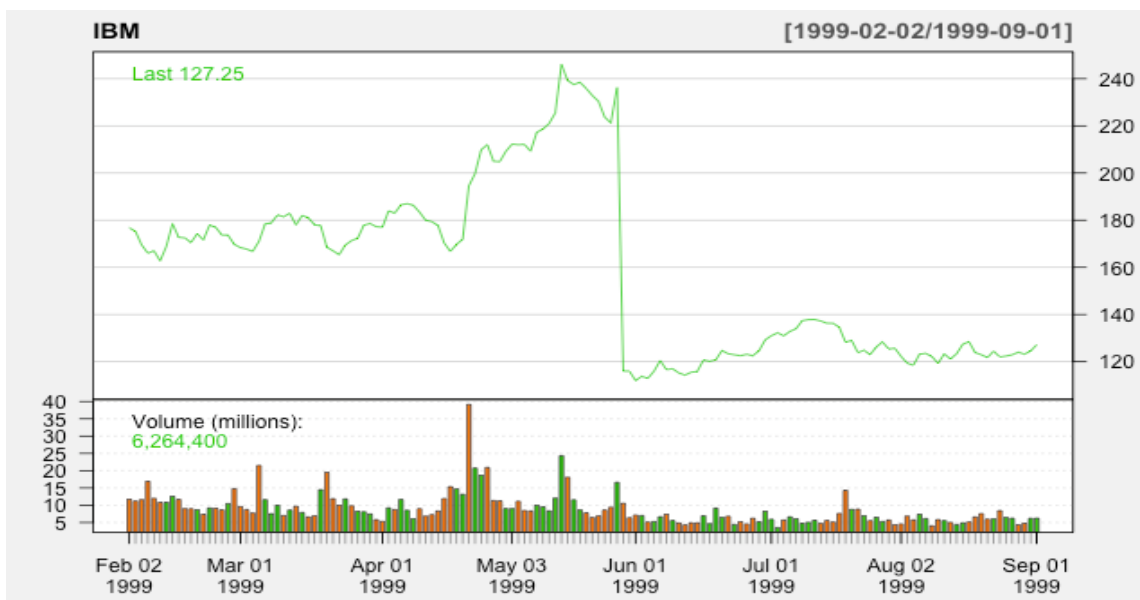


Same thing happened to Intel, Microsoft and Yahoo.



Here is a comparison figure showing that the stock prices of IBM, Apple and Amazon are much larger than that of Intel, Microsoft and Yahoo.

5 Extra about quantmod



It seems that around June 1999, the price of IBM had a sudden abnormal drop.

In quantmod there is a good way to get the splits information

```
> spl
```

```
IBM.spl
```

```
1973-05-29  0.80
```

```
1979-06-01  0.25
```

```
1997-05-28  0.50
```

```
1999-05-27  0.50
```

So we can see that 1999-05-07 IBM split its stocks from 1 to 2 which corresponds to the changes of the prices.

```
> IBM[index(IBM)=="1999-05-26",]
```

```
IBM.Open IBM.High IBM.Low IBM.Close IBM.Volume IBM.Adjusted
```

```
1999-05-26  223    236.62   221.44   236.25   16628000    98.14
```

```
> IBM[index(IBM)=="1999-05-27",]
```

```
IBM.Open IBM.High IBM.Low IBM.Close IBM.Volume IBM.Adjusted
```

```
1999-05-27  116.69  116.88   112.62   116     10552500    96.37
```

We can see the price on 5-27 is almost half of it on 5-26.

6 Conclusions

In the project we looked back on the stock prices of several IT companies. And we tried to find the corresponding moments. We had a brief review of the three important stock

crises. We also built an app that can help us get the historical data and draw the graph of stocks. Compared to the existing free web apps, like google yahoo and sina, our app could be improved by adding other stuff, like html or ggvis or javascript. We may continue later.