**Observations**

* The idea behind this data analysis was to observe the growth of various industries in different cities in the US between the years 2007 – 2016. We see picked some of the well-established economic giants such as New York city on the east coast, San Francisco on the west coast, Houston in south & Chicago in mid-west. Along with that we were curious to observe trend in some upcoming cities such as Austin in Texas which is traditionally oil driven economy (manufacturing sector) which currently in lime light because of new tech storm in the city. Similarly, Detroit which is traditionally a manufacturing hub and we were curious to see what kind of balance between manufacturing and tech in recent year exists in it. And finally, Boston, the innovation hub, we wanted to see how manufacturing sector is doing compared to Tech.
* The data source for the project is US Gov. Census data:
  + Population of the Cities
  + Payroll, yearly for metro area for the respective cities
  + Establishments (count years) for manufacturing sector and tech sector for the metro are
  + Employment (count years) for manufacturing sector and tech sector for the metro are
* Factors consideration for manufacturing sectors and tech sectors:
  + Data for Manufacturing & Mining, quarrying and oil & gas extractions were grouped together and considered under “manufacturing sector “ for the trend observations
  + Data for Information, Finance and insurance and Professional, scientific and technical services were grouped together and considered under “Tech sector “ for the trend observations
* **New York:**

In New York City, the population has steadily increased over the decade as expected but on the flip side the number of establishments in manufacturing sector has experience the great hit right after year 2008 and plummeted sharply between the year 2008 and 2011 and more so number of jobs. In the manufacturing sector, number of jobs decreased by 20% over the period of 2008 – 2010, after the year 2010 there was some stability observed but manufacturing jobs kept on decreasing. The overall salary scale was maintained right after sudden drop in 2008, but overall manufacturing jobs in New York is observed to be in steady decline.

On the other hand, Tech sector in New York has been doing quite well, the numbers of new companies have been opening at the steady pace and so as employment. Above all, the pay scale in Tech jobs has grown leaps and bounces. Since year 2010 the salary growth in Tech sector has grown by 35%.

* Houston:

Houston has been one of the biggest cities in south and considered to be oil driven economy and as any other metropolitan city, the population has been growing steadily in Houston. Along with being an oil giant, Houston is known as space city, and expected to be doing good in both manufacturing sector and Tech sector.

From our observation, it can be seen that, 2008 recession has hit Houston too and the sudden drop in businesses and jobs in both manufacturing sector and Tech sector can be seen. Right after 2010, the city has been doing equally better in both mechanical and in tech industry and growing.

In the recent years, since year 2015, the pay & establishments in both mechanical sector and the tech sector has been on sharp decline. The reason for this sudden drop in the scope of this project but it assumed that probably lot of businesses have been moving from Houston to upcoming cities such as Austin.

* San Francisco:

San Francisco has been a Tech hub and cradle of the most computer related companies. The most attractive thing about San Francisco is observed to the pay scale in the Tech companies. The pay scale in Tech has grown by more than 80% between the year 2007-2015, That certainly makes it an accretive place to be I that city for someone working in Tech. However, between the year 2015 – 2016 the growth has not been more than 5%. The tech companies and the tech jobs have also been growing constantly.

In manufacturing sector, right after recession on 2008, market had been going down and establishments, job and salary was going down steadily, but right after year 2015it is observed that the manufacturing sector has been revived, and jobs have been increasing and so as the pay. This increment is assumed to be the by-product of the robotics & hardware advancement in the Silicon Valley. As the tech companies growing in robotics, they probably need more and more hardware and the manufacturing industries have been doing better in recent time.