CVS Health

CVS Health Corporation Business Analytics Issue

Northeastern University
D'Amore-McKim School of Business
Zinaida Dvoskina | Kirill Ilin

Introduction and Business Problem

In 2018, CVS acquired a health insurance company Aetna, marking the start of transforming the consumer health experience by combining health care benefits with retail locations, walk-in medical clinics, and integrated pharmacy capabilities. (2019 Annual Report) According to the company's own forecast, Aetna's acquisition has the potential to deliver over $900 million of synergies and increase EPS to double-digit by 2022. (Investor Day 2019, p. 18)

While CVS is managing its new acquisition and debt burden, all of its businesses (Retail Pharmacy Segment, Pharmacy Service Segment, Health Care Benefits) are being directly affected by COVID-19. However, unlike most companies, CVS has a good chance of thriving, not surviving this year. They are in a good market position due to their previous outstanding performance, great brand value, a unique combination of core competencies, and successful Aetna acquisition.

In our analysis, we covered several important milestones to access CVS performance:

First, we ran a sentiment analysis of the market experts' expectations from the **Aetna acquisition**, most of whom had concluded that it was very risky and questioned whether it was valuable in the long-run for the customers.

We also assessed how the **COVID-19** affected the company's operations, and while it was damaging most of the company's operations, it was extremely valuable for the Aetna insurance department, which allowed its revenue to grow.

Then we assessed the company's capabilities and the value chain in order to have a full picture of the company's strategy, CVS's intentions and plans for the future given the pandemic and Aetna's presence.

We ran two regression models and predictions for share price and EPS of CVS Health to see how it performed relative to its own and market experts' forecasts.

Aetna Acquisition

Was the Aetna acquisition worth it for CVS in terms of profitability, goodwill, and synergies?

Disclaimer: for the purpose of discussing the effects of the Aetna acquisition, it makes the most sense to look at 2019 full year (which has isolated Aetna-related effects) rather than 2020, which has a significant impact of COVID-19 and joint influence of health insurance demand during the pandemic.

Operating income increased by 198% in 2019 compared to 2018. The increase was primarily due to the impact of the Aetna Acquisition but was partially offset by an increase in intangible asset amortization and the absence of $536 million in interest income on the proceeds from financing - both related to the Aetna acquisition.

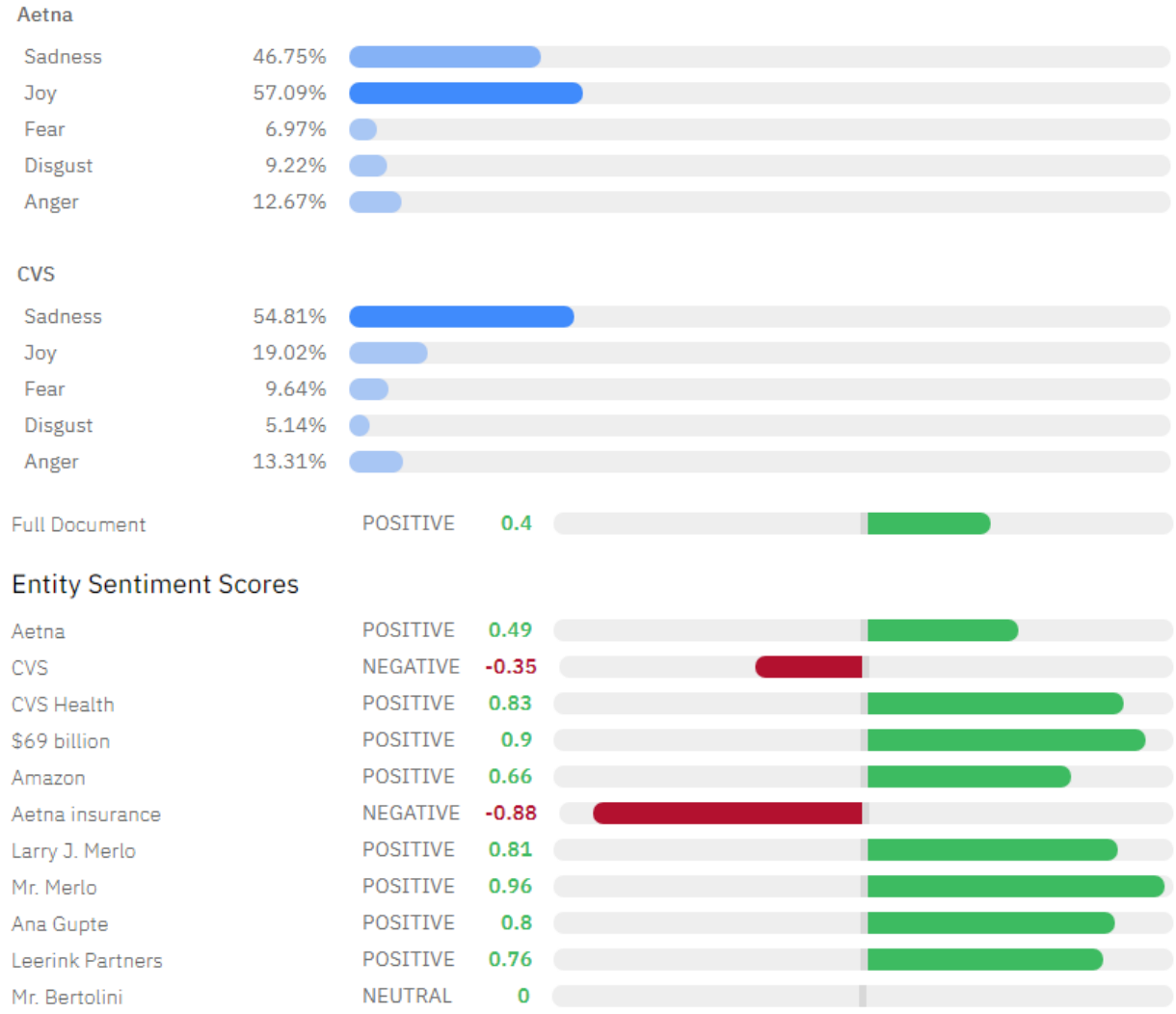
With Aetna, CVS added the Health Care Benefits segment. The transaction was accounted for using the acquisition method, which requires the assets acquired and liabilities to be recognized at their fair values. As a result, given the close proximity of the Aetna Acquisition Date to the 2019 annual impairment test of goodwill, as expected, the fair value remained relatively in line with the carrying value.

In 2019, CVS delivered approximately $500 million of cost-saving integration synergies from the Aetna acquisition, ahead of their initial goal of $300-350 million. CVS believes that it is on track to achieve its 2020 target of $800-900 million of synergies from the Aetna Acquisition but expects to continue to incur significant costs associated with combining the operations of CVS Health and Aetna; therefore, they might not achieve their projected synergies.

Upon closing the Aetna Acquisition, CVS assumed long-term debt with a fair value of $8.1 billion, with interest rates ranging from 2.2% to 6.75%. CVS increased indebtedness and elevated debt-to-equity ratio reduce their flexibility to respond to changing business and economic conditions and increasing interest expense. The amount of cash required to service their increased indebtedness may create competitive disadvantages relative to other companies with lower debt levels. Interest expense increased to $416 million in 2019 compared to 2018. (2019 Annual Report)

Did the sentiment of the market experts on the acquisition change? We ran a sentiment analysis of the articles about the Aetna acquisition and CVS performance using the IBM Watson Natural Language Understanding tool (DTE NLU Demo). The articles go back to 2017 when CVS announced the acquisition of Aetna and analyze the opportunities and threats of the merger as well as explore benefits from the current market situation in healthcare. Running a sentiment analysis, we were able to see the approximate evaluations of the acquisition by the experts in the industry.

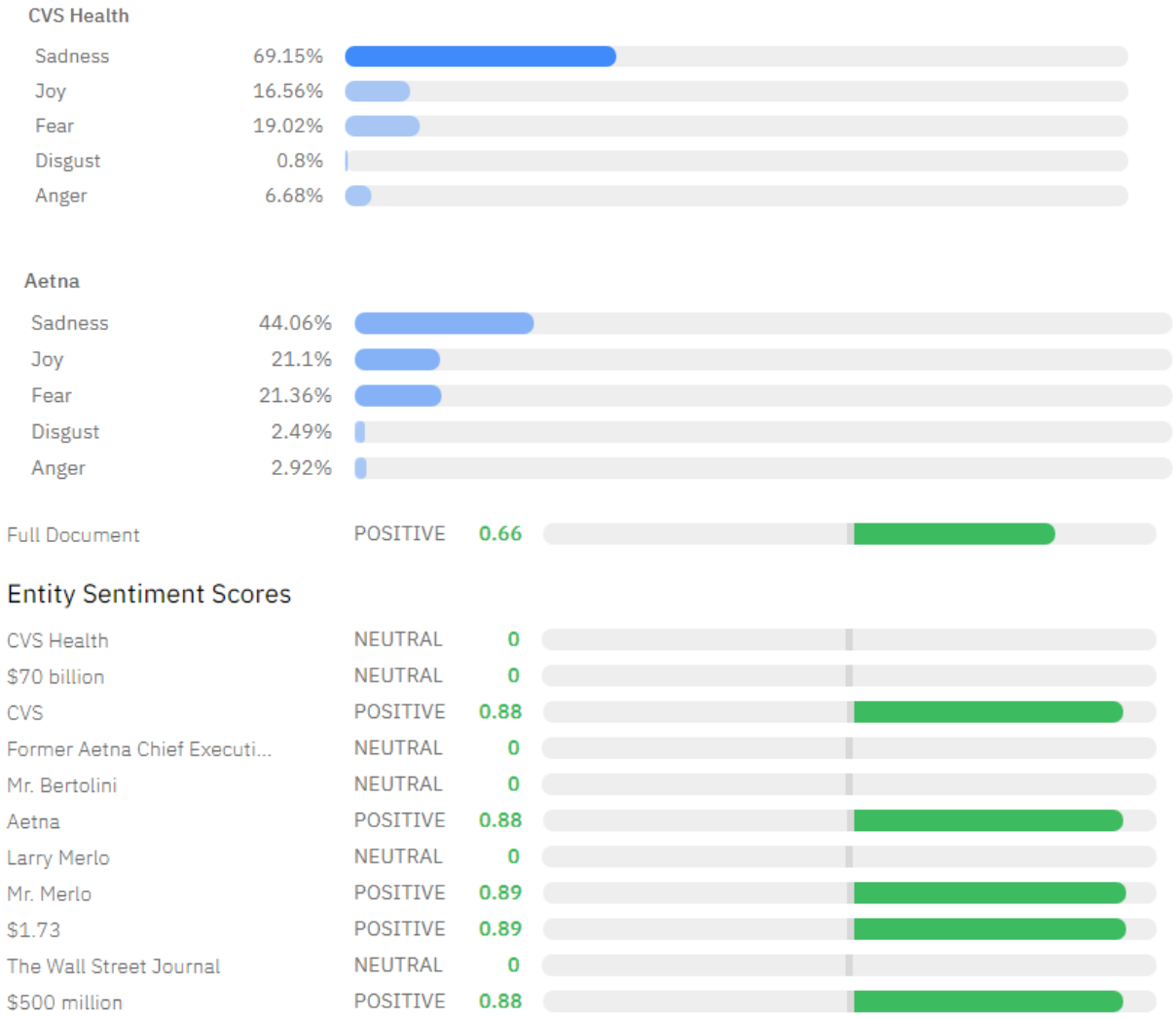
Article 1. CVS to Buy Aetna for $69 Billion in a Deal That May Reshape the Health Industry
(Merced & Abelson, 2017)



Sentiment analysis of the first article shows overall positive emotion through the article; however, it is slightly negative in entities such as CVS and Aetna Insurance, which contradicts the positive score of the CVS Health entity. That is probably due to the fact that while both entities refer to the same company, they were used in different contexts. While CVS was used in the assessment of Aetna acquisition risks, CVS Health was used when describing the company's success and strategic moves. Overall positivity is damaged by the fact that the healthcare industry is changing, with many competitors such as Amazon entering the market, causing significant risks for such a merger.

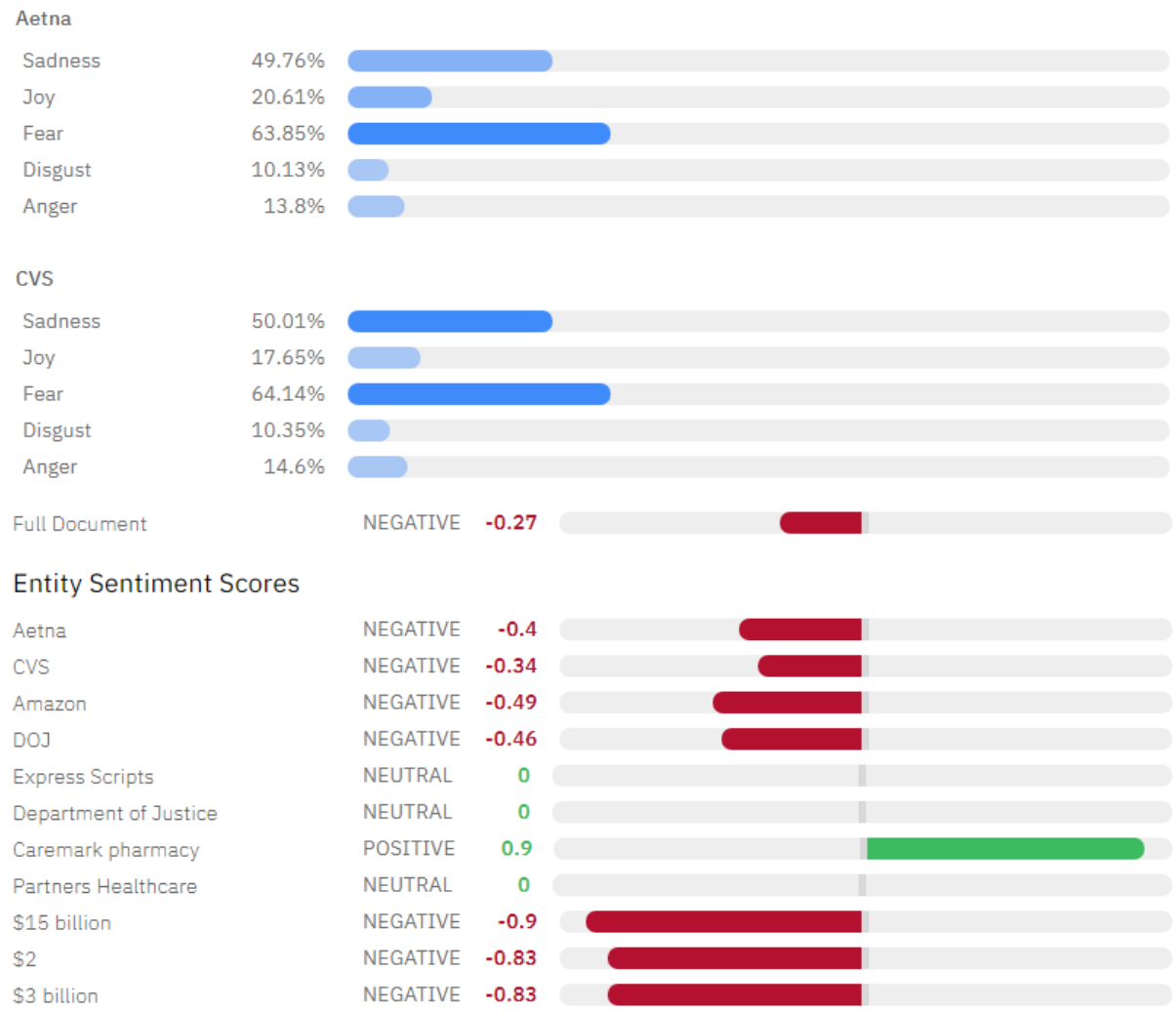
Article 2. CVS Deal Debate Isn't Over

(Grant, 2020)



The second article is primarily positive toward all of the entities mentioned. That is due to the fact that it was updated recently in 2020. Even though the acquisition happened 2 years ago, investors are still in doubt about its success. Nevertheless, recent CVS Health performance metrics indicate that they are quite successful despite COVID-19 concerns and doubts from the market regarding the acquisition. Sadness is among the main emotions since the acquisition is being viewed negatively despite the company's success.

Article 3. The CVS-Aetna Merger Hinges on One Question: What Do Consumers Get Out of It? (Gomes-Casseres, 2017)



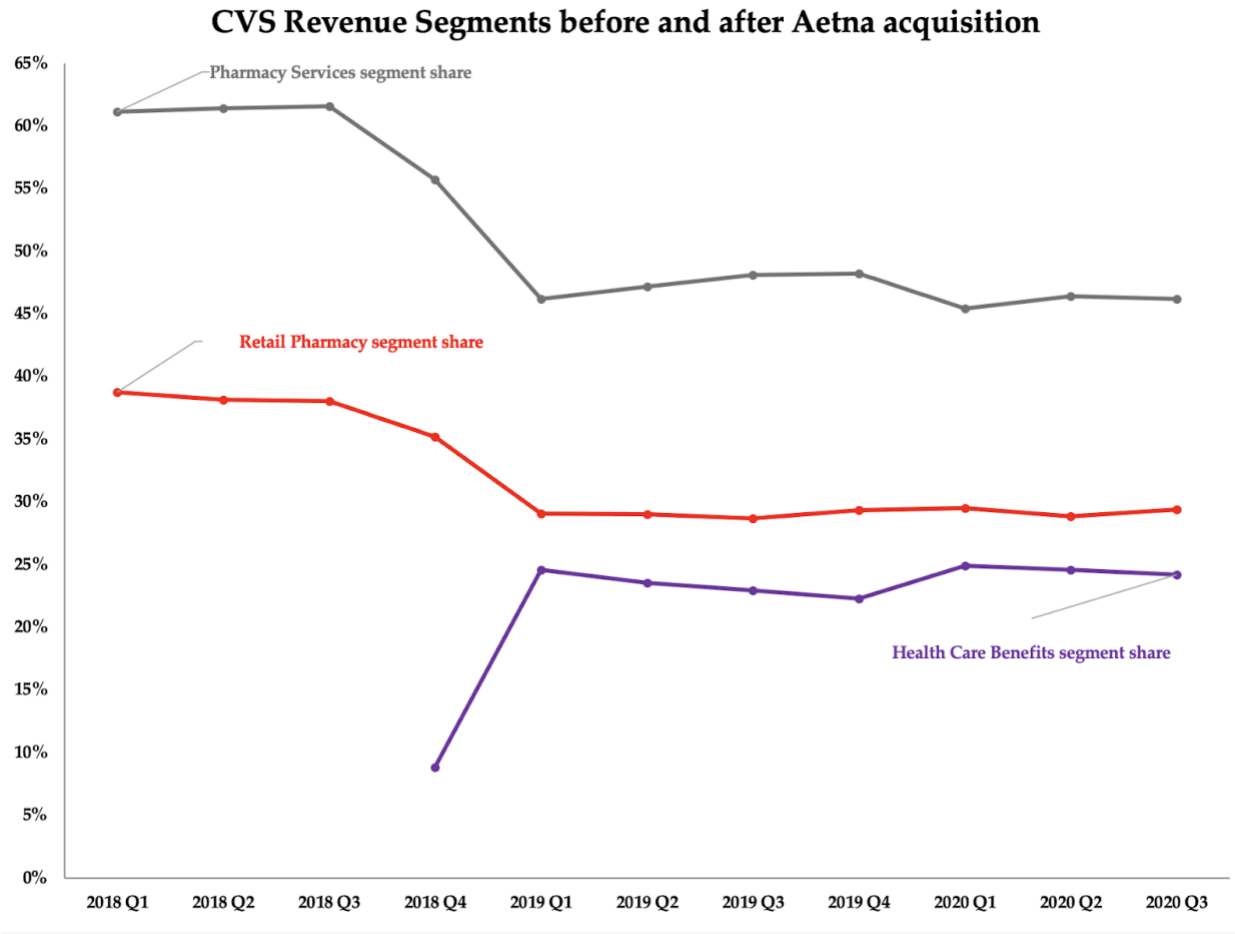
The last article was written in 2017 at the time of the acquisition announcement. That article expresses heavy concerns regarding the success of the acquisition and explores how it would benefit the customer. The author sees that merger as an act of defense under the threat of Amazon entering the healthcare market and questions if the two companies would be creating benefits. That results in the sentiment scores being mostly negative. In addition to that, the strongest emotions related to CVS and Aetna are fear and sadness, which gives a great picture of the author's perception of the acquisition.

Sentiment analysis summary

The majority of the evaluated articles expressed heavy concerns regarding the meaning and future value of the acquisition. The authors mentioned a huge threat of Amazon entering the healthcare market and its effects on the companies in the field. In addition to that, they were unsure of the company's intentions and the way of creating value for the customers. Based on that, we can say that the forecasts from the market experts were negative and that this acquisition may result in CVS wasting money for no additional revenue and profit and losing a solid portion of the brand valuation. Now we can compare the actual performance compared to the market experts' forecasts as well as the forecasts for the company itself.

Revenue Segments

How is the ratio of revenue segments (Pharmacy Services, Retail Pharmacy, Health Care Benefits) changing over time after the Aetna acquisition?



Aetna's presence in CVS Health adds to its existing capabilities, significantly increasing revenue by incorporating an additional revenue stream. Just within 1 year of operations, complicated by COVID-19, revenue stream from Aetna has reached almost the same level as the retail segment, which indicates great overall performance and a worthy acquisition. However, it is important to compare it to the company's and experts' expectations in order to give it a proper performance assessment.

COVID-19

How is COVID-19 affecting CVS operations?

CVS Health was very quick in response to the COVID situation. In the first months of the pandemic, they launched special facilities for testing and incentive programs for the employees. In addition to that, they made many new hires to support the operations during the COVID in order to fulfill customers' demand for testing and care.

Overall it played out very well for the company, especially since the Aetna insurance department witnessed a great increase in the operation due to the increased demand. In the 3rd quarter of 2020, the company has estimated COVID adverse impact of $0.15 - $0.18 on GAAP diluted and Adj EPS, primarily investments in HCB. In addition to that, CVS expects to play a significant role in all vaccine administration in the future. Adjusted operating income decline is explained by the company to be "primarily driven by the planned COVID-19 related investments, costs associated with actions to right size our operations and divestitures of Aetna's PDP and Workers' Compensation business".

List of the COVID impact on the company's performance in 3rd quarter of 2020:

<u>Pharmacy Services</u>

- Lower prescription volume impacted by reduction in new therapy prescriptions

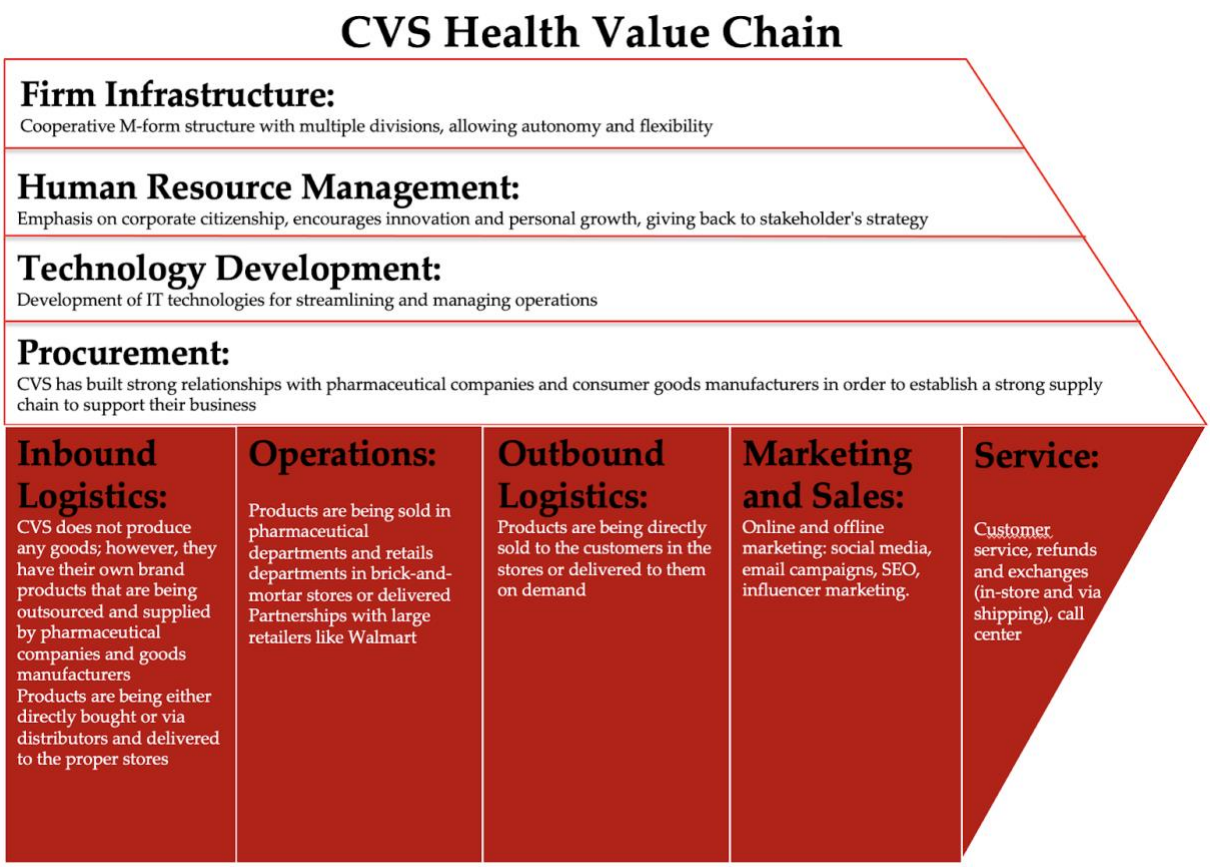
<u>Retail / LTC</u>

- Increase in diagnostic testing
- Incremental costs in operations

<u>Health Care Benefits</u>

- "Planned investments made in our customers and members and provisions for potential payments to clients and plan sponsors for contractual and regulatory requirements"
- "Utilization continued at more normal levels with select geographies affected by COVID-19 waves"

Strategy



(Anderson, 2019)

Capabilities: Maintaining high brand value, economies of scale, operational complementation.

Core capability: Providing Care Delivery Ecosystem which means value-based contracting with aligned incentives; clinical risk stratification and predictive modeling

CVS Health is aligning its strategy with current healthcare market trends, introducing mobile care centers in stores, aiming at driving down costs, and bringing value to customers through flexibility, availability, and lower price.
We assessed CVS Value Chain in order to see how the company operates and what are its core capabilities. Aetna acquisition aligns with the company's strategy and capabilities and, theoretically, allows it to increase the specter of its operations and drive down the costs. (Investor Day 2019)

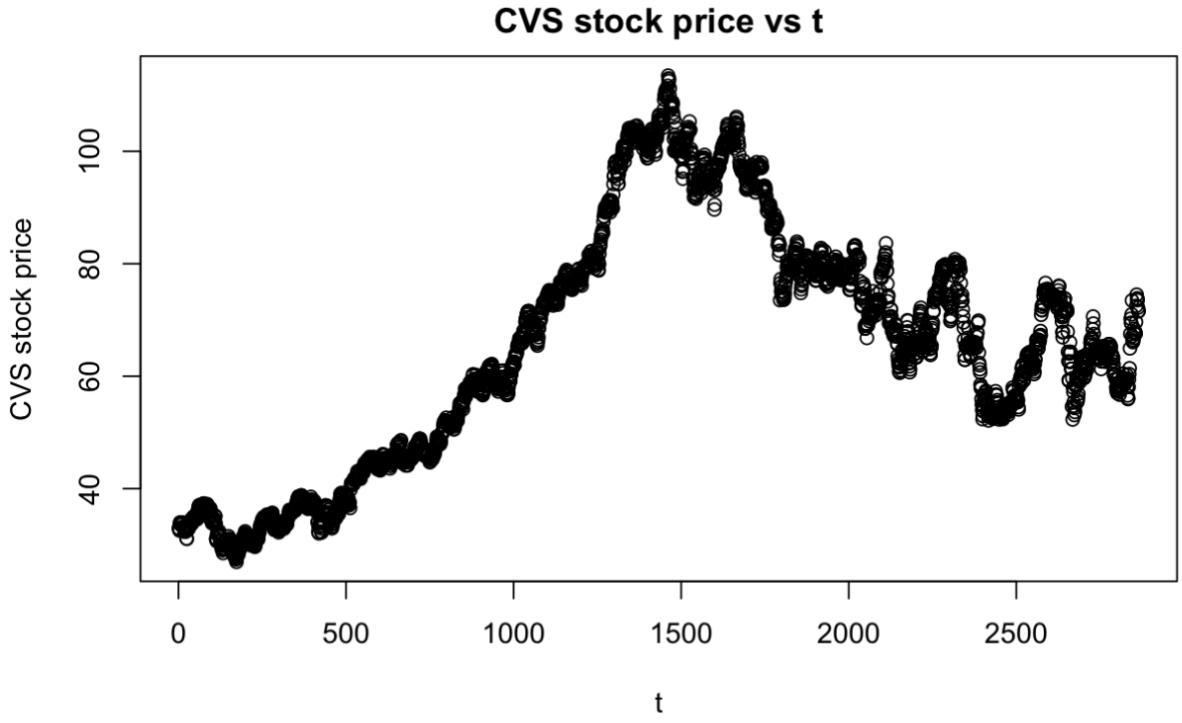
CVS Share Price and EPS during COVID-19 and after the Aetna acquisition

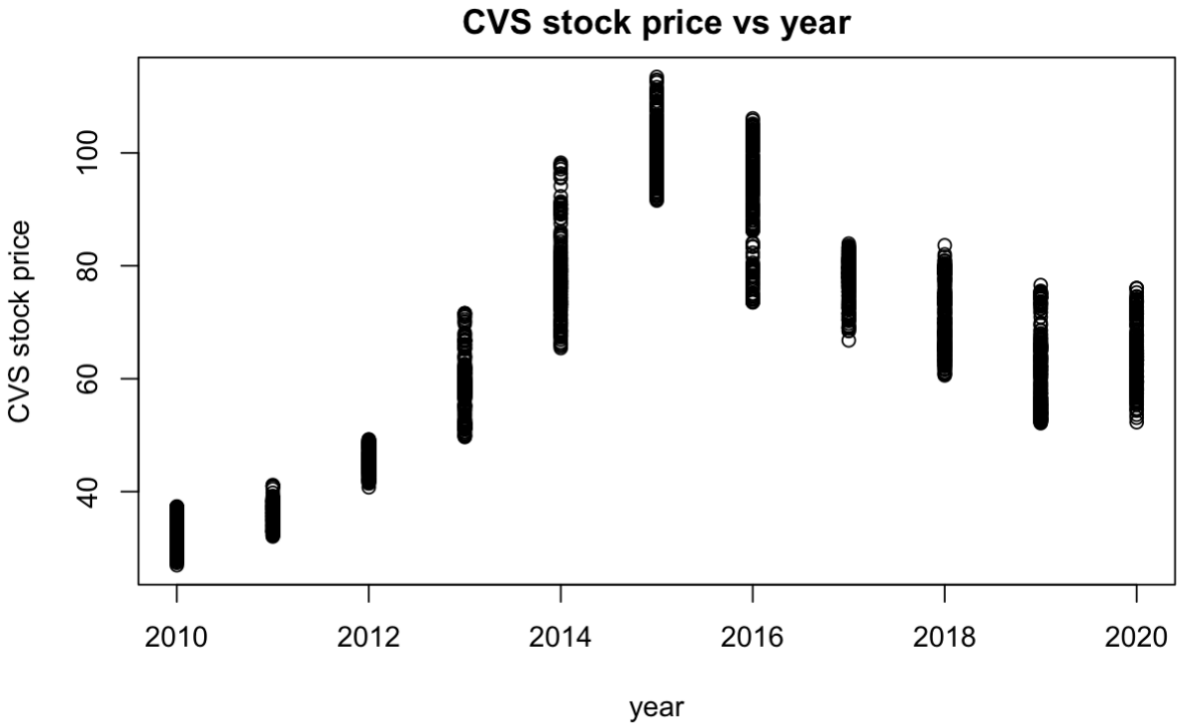
Share price analysis and prediction

In this section, we analyzed the share price of CVS in the last ten years. We have gathered data from Gurufocus, transformed it into an R-readable table, added dummy variables for Aetna acquisition and COVID pandemic (starting with the first case in the US), and ran a regression model of share price with a set of predictors: **stock price ~ t+year+quarter+month+Aetna+COVID.**

However, the month variable produced singularities, so we decided to exclude it from the final model. **stock_price~t+year+quarter+Aetna+COVID.**

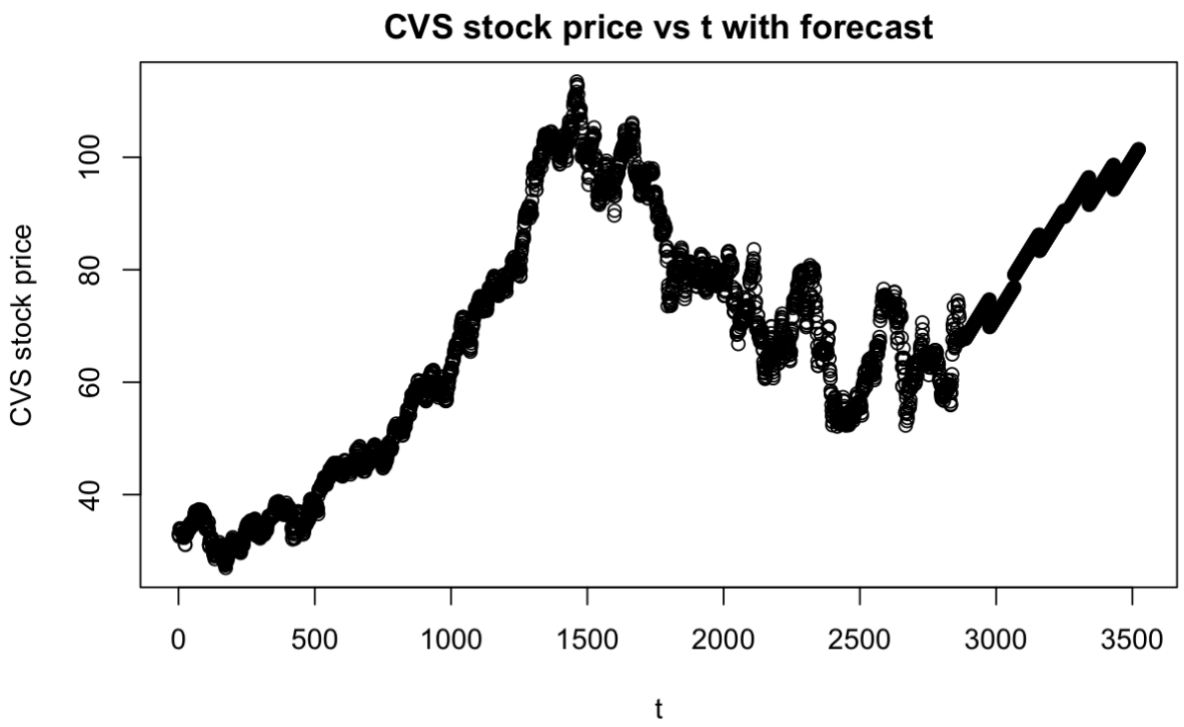
Based on the model, we made a prediction model for the share price until the end of 2021, which showed a stable day to day increase in the share price in the future year.

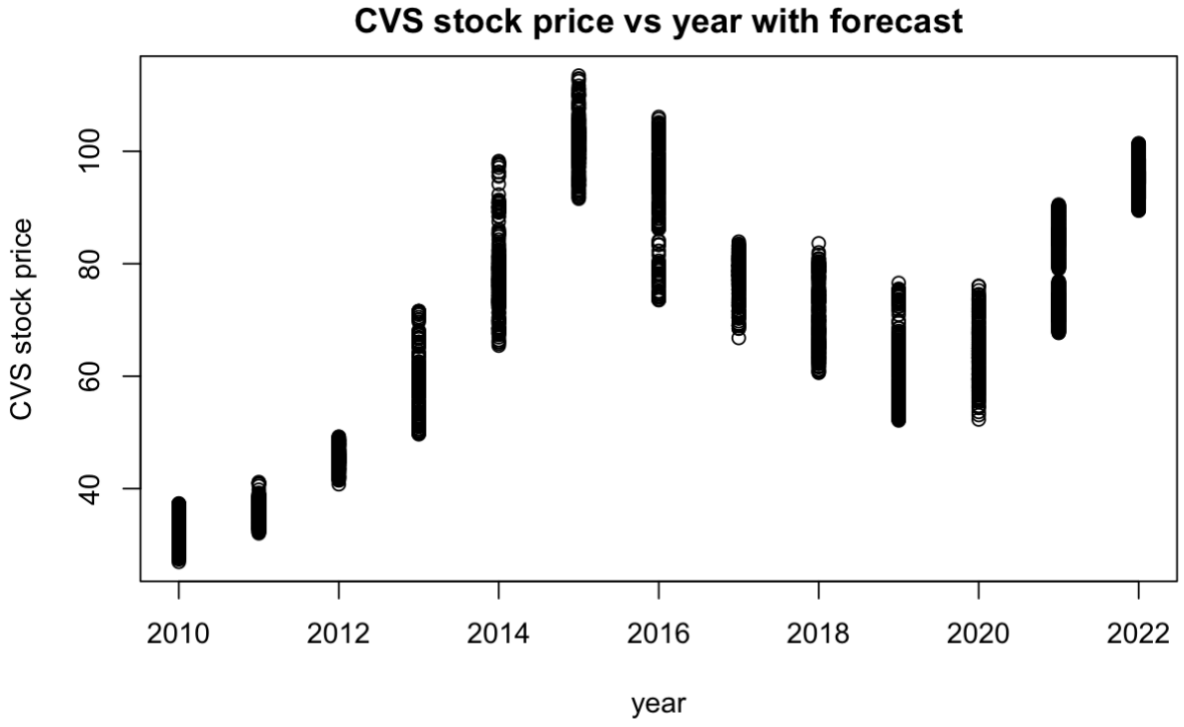



CVS stock price vs year
CVS stock price
40
60
80
100
2010
2012
2014
2016
2018
2020
year

```
Call:
lm(formula = stock_price ~ t + year + quarter + month + Aetna +
    COVID, data = daily_10years)

Residuals:
    Min      1Q  Median      3Q     Max
-34.247  -8.702  -3.237   8.157  42.410

Coefficients: (3 not defined because of singularities)
                 Estimate Std. Error t value Pr(>|t|)
(Intercept)     1.662e+05  2.113e+04   7.865 5.19e-15 ***
t               3.429e-01  4.014e-02   8.541  < 2e-16 ***
year           -8.267e+01  1.051e+01  -7.864 5.26e-15 ***
quarterq2      -7.467e+00  1.545e+00  -4.833 1.42e-06 ***
quarterq3      -4.362e+01  5.431e+00  -8.031 1.40e-15 ***
quarterq4      -5.206e+01  6.292e+00  -8.273  < 2e-16 ***
monthaugust     7.069e+00  1.541e+00   4.586 4.71e-06 ***
monthdecember  -7.881e+00  2.165e+00  -3.640 0.000278 ***
monthfebruary   7.647e+00  1.545e+00   4.949 7.89e-07 ***
monthjanuary    1.518e+01  2.115e+00   7.181 8.82e-13 ***
monthjuly       1.471e+01  2.174e+00   6.766 1.60e-11 ***
monthjune      -1.409e+01  2.171e+00  -6.487 1.03e-10 ***
monthmarch             NA         NA      NA       NA
monthmay       -7.043e+00  1.542e+00  -4.568 5.13e-06 ***
monthnovember  -5.726e+00  1.543e+00  -3.710 0.000211 ***
monthoctober           NA         NA      NA       NA
monthseptember         NA         NA      NA       NA
Aetna          -3.806e+01  1.041e+00 -36.551  < 2e-16 ***
COVID          -6.675e+00  1.229e+00  -5.431 6.06e-08 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 13.89 on 2837 degrees of freedom
  (12 observations deleted due to missingness)
Multiple R-squared:  0.5909,    Adjusted R-squared:  0.5888
F-statistic: 273.2 on 15 and 2837 DF,  p-value: < 2.2e-16
```

```
Call:
lm(formula = stock_price ~ t + year + quarter + +Aetna + COVID,
    data = daily_10years)

Residuals:
    Min      1Q  Median      3Q     Max
-35.083  -8.147  -3.724   7.836  41.023

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)  2.704e+04  7.332e+03   3.689 0.000230 ***
t            7.845e-02  1.394e-02   5.629 1.99e-08 ***
year        -1.344e+01  3.648e+00  -3.684 0.000234 ***
quarterq2   -4.937e+00  1.172e+00  -4.212 2.61e-05 ***
quarterq3   -9.361e+00  1.965e+00  -4.763 2.01e-06 ***
quarterq4   -1.229e+01  2.832e+00  -4.342 1.46e-05 ***
Aetna       -3.871e+01  1.037e+00 -37.319  < 2e-16 ***
COVID       -6.547e+00  1.233e+00  -5.308 1.19e-07 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 14.05 on 2845 degrees of freedom
  (12 observations deleted due to missingness)
Multiple R-squared:  0.5803,    Adjusted R-squared:  0.5793
F-statistic:   562 on 7 and 2845 DF,  p-value: < 2.2e-16
```


CVS stock price vs t with forecast
CVS stock price
40
60
80
100
0
500
1000
1500
2000
2500
3000
3500
t


CVS stock price vs year with forecast
CVS stock price
40
60
80
100
2010
2012
2014
2016
2018
2020
2022
year

Share price analysis findings:

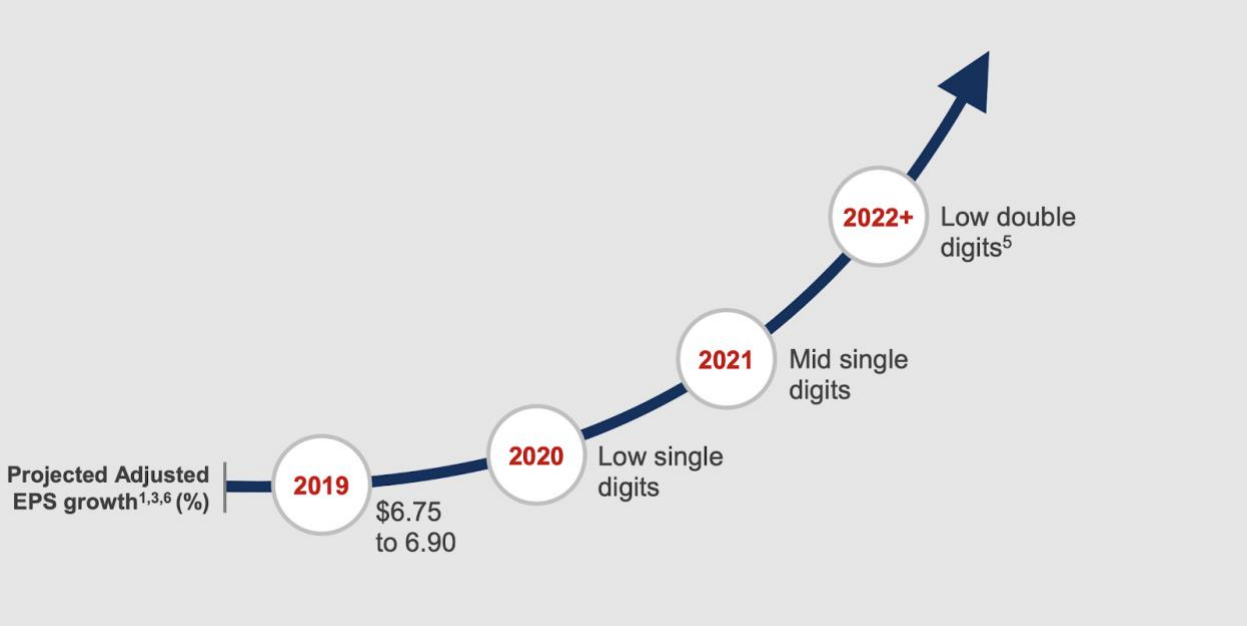
Based on the company's performance, Aetna's presence and COVID situation, we predicted share price to steadily increase in the upcoming year. What was interesting is that Aetna's presence in the model negatively affected the share price, which we think is due to the fact that the acquisition has heavily diluted shares, which resulted in the price drop, therefore negatively presented in the model. As we gather more data on the operations of CVS with Aetna, we expect to see a positive effect on the share price eventually with prediction for 2021.

Assumption: by the end of june 2021 the majority of the population will get vaccinated and COVID will be over.

EPS analysis and prediction

CVS is using adjusted (non-GAAP) EPS as one of its main KPIs. As the result of the Aetna acquisition, they were predicting significant EPS growth, but even managed to outperform it in 2019 and will have outperformed it in 2020.

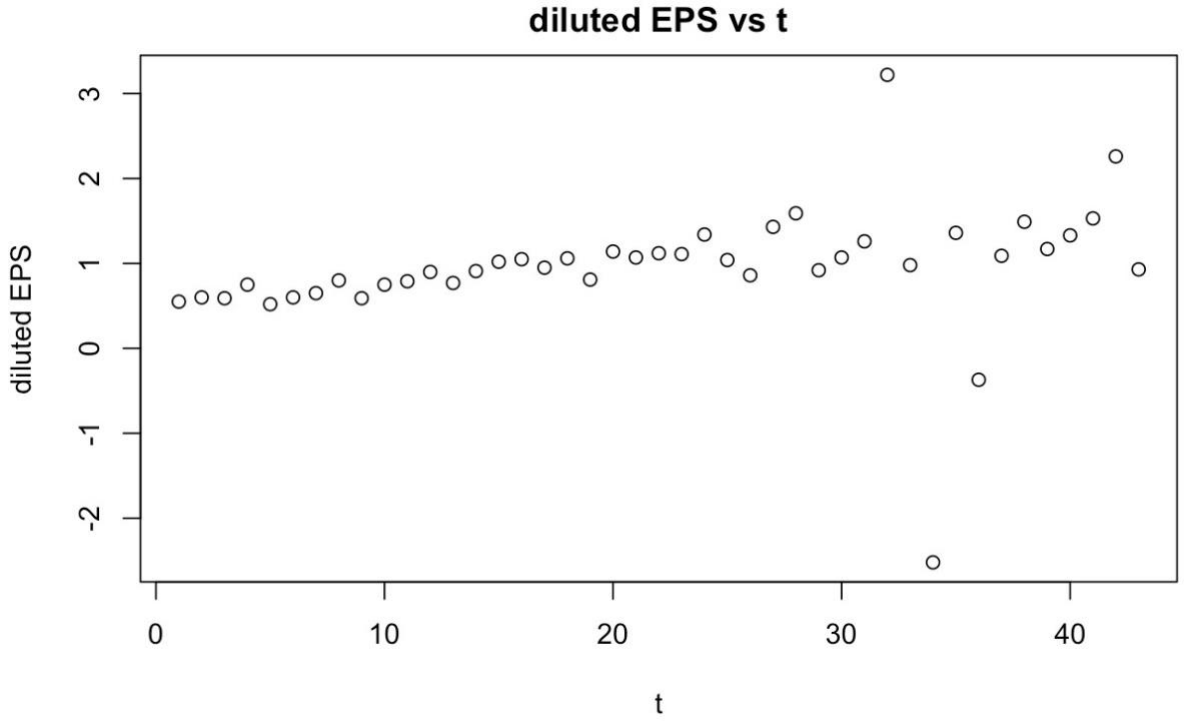
COVID-19 made a positive impact on EPS in the 1st and 2nd quarters, as CVS met elevated consumer and member needs.

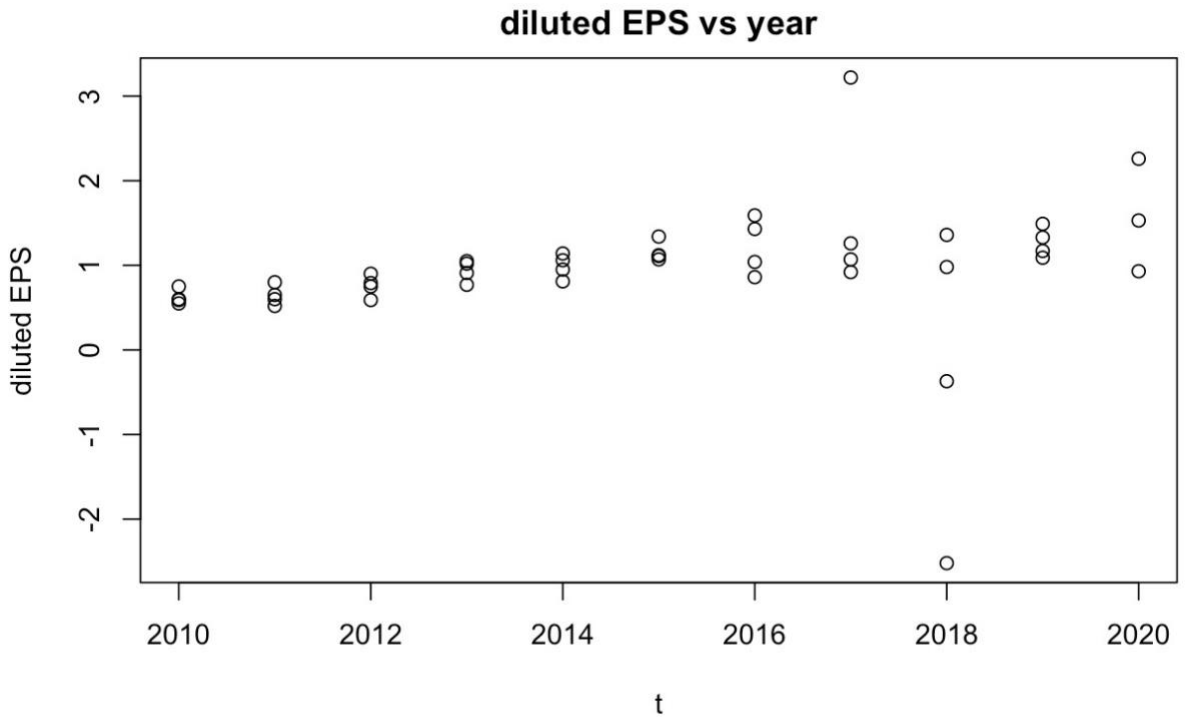


	Forecasted during 2019 Investor Day	Adjusted EPS
2015		5.16
2016		5.84
2017		5.9
2018		7.08
2019	[$6.75 - 6.90]	7.08
2020 CVS prediction	low single digits	$7.35 – $7.45
2021	mid single digits	
2022	low double digits	

	Adjusted EPS		COVID-19 effect
Q1 2019	$1.62		

Q2 2019	$1.89		
Q3 2019	$1.84		
Q4 2019	$1.73		
Q1 2020	$1.91	18%	+[$0.1]
Q2 2020	$2.64	40%	+[$0.70 – $0.80]
Q3 2020	$1.66	-10%	-[$0.15 – $0.18]





We ended up not considering a EPS model in our conclusion, since we could not see any time trend in our model which was presented graphically above. Therefore we rely on the information from the CVS Health itself and their prediction regarding the EPS growth in the next two years. We looked at the actual numbers versus what they have been predicting so far and based our assessment on that comparison.

Conclusion

Summarizing all the data, it is safe to say that despite all the concerns and risks related to the acquisition, CVS with Aetna has outperformed their own and market experts' predictions in terms of EPS. It was only a short period before the Pandemic when we could estimate an isolated effect of Aetna acquisition without COVID-related effects. Strategically, the acquisition was a great move that allowed the company to implement its new capability of providing a health care delivery ecosystem in a situation of extreme demand.

In order to more accurately predict the long-term value of that acquisition, many other external factors need to be addressed, such as the Democrats in the office with the intention to restore Obamacare and not suspend the Health Insurer Fee, which will affect the operations of CVS. In addition to that, the company's actions were perceived to be defensive under the threat of Amazon entry, which needs to be addressed separately in a competitors' analysis. However, for now, it is safe to say that CVS's strategy is preemptive and accurate under such threat as Amazon; but they still need to prove their success on the market. The acquisition itself promises to bring a lower-cost, more personalized care to well-known CVS. The fact that CVS's performance so far was better than any prediction, along with all other data in the analysis, tells us that Aetna's acquisition was a great move and proved to be valuable so far with future potential.

Appendix

Reference

2019 Annual Report. (2020, April 3). https://s2.q4cdn.com/447711729/files/doc_financials/2019/annual/FINAL-CVS-AR-bookmarked.pdf

Investor Day 2019. (2019, June 4). https://s2.q4cdn.com/447711729/files/doc_events/2019/InvestorDay2019/2019-CVS-Investor-Day-Full-Presentation.pdf

DTE NLU Demo. https://www.ibm.com/demos/live/natural-language-understanding/self-service/home

Merced, M. J. D. L., & Abelson, R. (2017, December 3). *CVS to Buy Aetna for $69 Billion in a Deal That May Reshape the Health Industry*. The New York Times. https://www.nytimes.com/2017/12/03/business/dealbook/cvs-is-said-to-agree-to-buy-aetna-reshaping-health-care-industry.html

Grant, C. (2020, February 12). CVS Deal Debate Isn't Over. The Wall Street Journal. https://www.wsj.com/articles/cvs-deal-debate-isnt-over-11581535334

Gomes-Casseres, B. (2017, November 15). The CVS-Aetna Merger Hinges on One Question: What Do Consumers Get Out of It? Harvard Business Review. https://hbr.org/2017/11/the-cvs-aetna-merger-hinges-on-one-question-what-do-consumers-get-out-of-it

Anderson, D. (2019, March 29). *CVS's Business Model, Generic Strategy & Intensive Growth Strategies*. Rancord Society. https://www.rancord.org/cvs-business-model-generic-competitive-intensive-growth-strategies

Clark, R. (2019, March 16). What About R&D? Examining the Impact of the CVS/Aetna Merger on the Pharma Market. Copyright Clearance Center. https://www.copyright.com/blog/potential-cvs-aetna-merger-pharma-market

Data

CVS Health Corp. GuruFocus.com. https://www.gurufocus.com/stock/CVS/guru-trades

Applied concepts from MSBA classes

1. Analytics Applications, Sentiment Analysis (MISM 6200)
2. Building a Competitive Advantage - How Businesses Compete (MISM 6200)
3. Value Chain Configuration (MISM 6200)
4. Regression Analysis Introduction (MISM 6202)
5. Forecasting with Seasonality (MISM 6202)

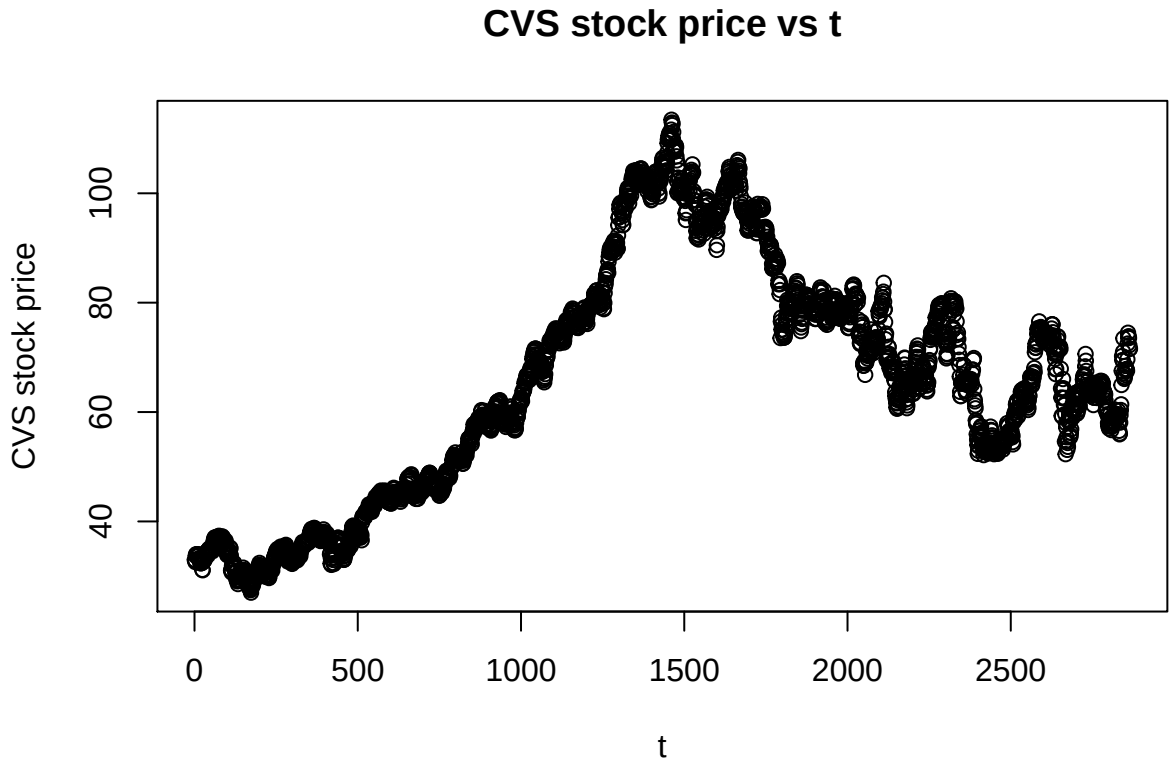
Appendix - CVS regression models

Data Source:

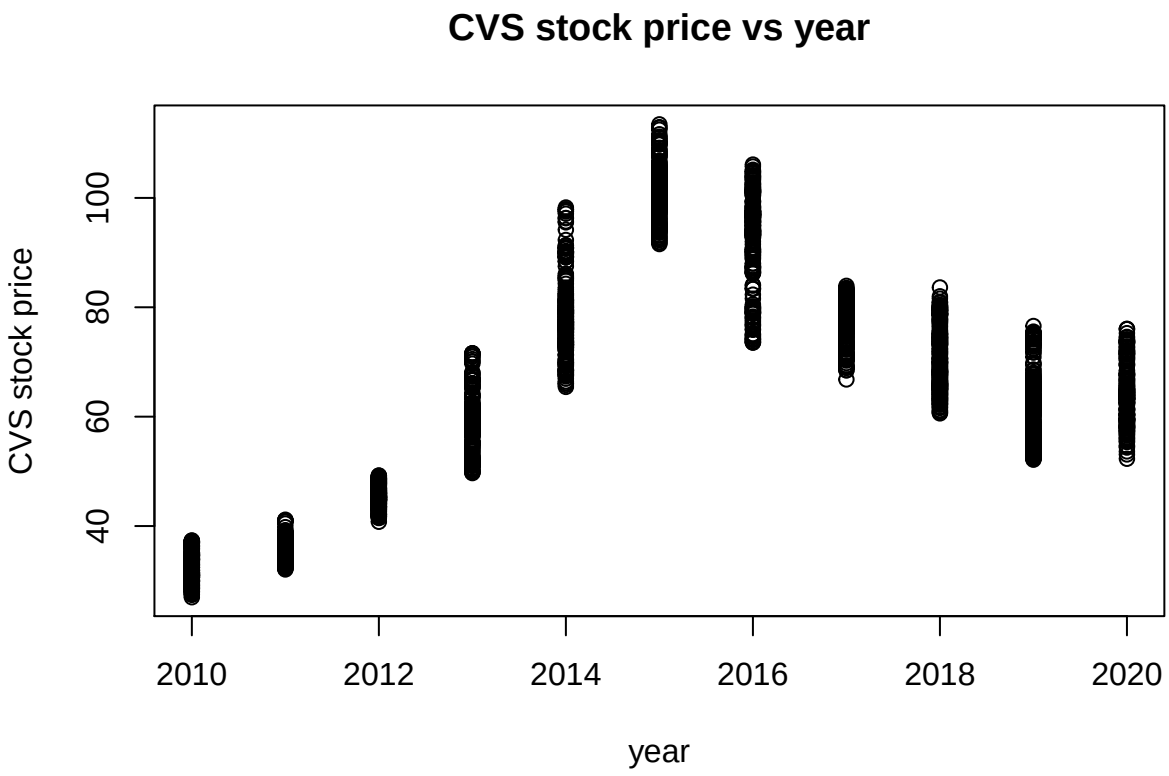
CVS Health Corp.GuruFocus.com.

https://www.gurufocus.com/stock/CVS/guru-trades

```
library(readxl)
daily_10years <- read_excel("daily_10years.xlsx")
plot(daily_10years$stock_price~daily_10years$t,
     xlab="t", ylab="CVS stock price", main="CVS stock price vs t")
```




```
plot(daily_10years$stock_price~daily_10years$year,
     xlab="year", ylab="CVS stock price", main="CVS stock price vs year")
```




```
model_stock_price_1 <- lm(stock_price~t+year+quarter+month+Aetna+COVID,data=daily_10years)
summary(model_stock_price_1)
```

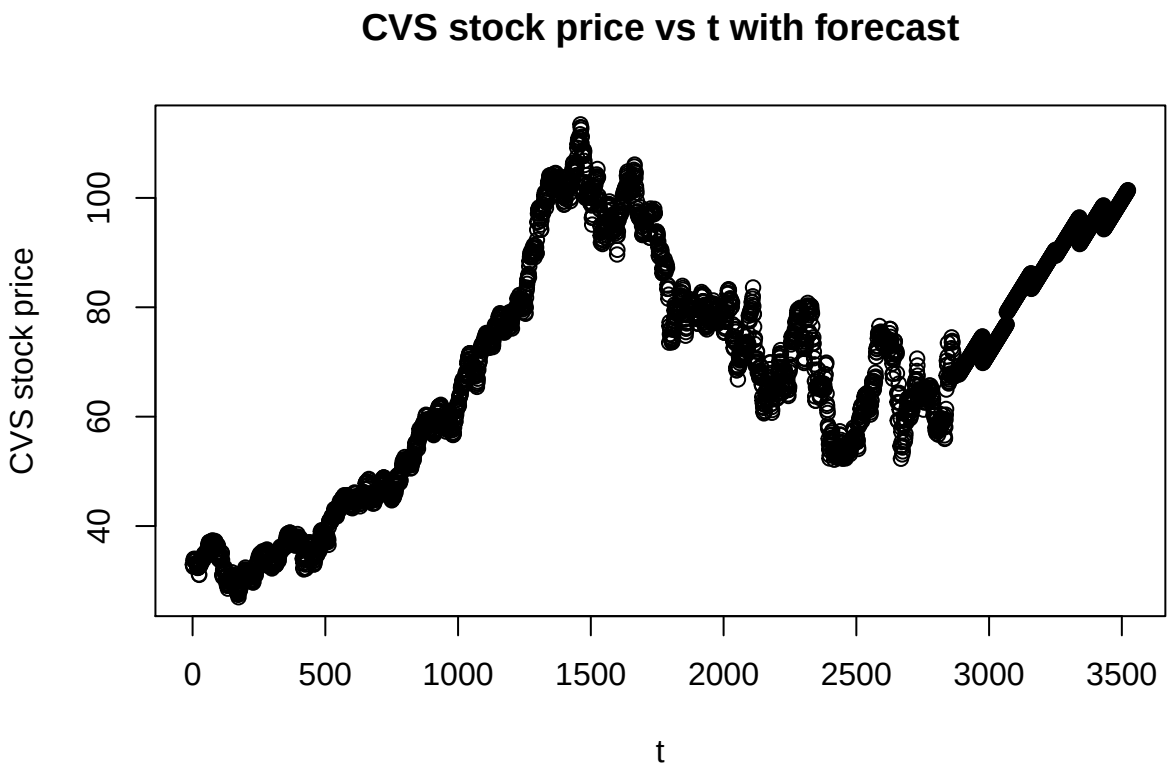
```
##
## Call:
## lm(formula = stock_price ~ t + year + quarter + month + Aetna +
##     COVID, data = daily_10years)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -34.247  -8.702  -3.237   8.157  42.410
##
## Coefficients: (3 not defined because of singularities)
##                   Estimate Std. Error t value Pr(>|t|)
## (Intercept)     1.662e+05  2.113e+04   7.865 5.19e-15 ***
## t               3.429e-01  4.014e-02   8.541  < 2e-16 ***
## year           -8.267e+01  1.051e+01  -7.864 5.26e-15 ***
## quarterq2      -7.467e+00  1.545e+00  -4.833 1.42e-06 ***
## quarterq3      -4.362e+01  5.431e+00  -8.031 1.40e-15 ***
## quarterq4      -5.206e+01  6.292e+00  -8.273  < 2e-16 ***
## monthaugust     7.069e+00  1.541e+00   4.586 4.71e-06 ***
## monthdecember  -7.881e+00  2.165e+00  -3.640 0.000278 ***
## monthfebruary   7.647e+00  1.545e+00   4.949 7.89e-07 ***
## monthjanuary    1.518e+01  2.115e+00   7.181 8.82e-13 ***
## monthjuly       1.471e+01  2.174e+00   6.766 1.60e-11 ***
```

```
## monthjune      -1.409e+01  2.171e+00  -6.487 1.03e-10 ***
## monthmarch             NA         NA      NA       NA
## monthmay       -7.043e+00  1.542e+00  -4.568 5.13e-06 ***
## monthnovember  -5.726e+00  1.543e+00  -3.710 0.000211 ***
## monthoctober           NA         NA      NA       NA
## monthseptember         NA         NA      NA       NA
## Aetna          -3.806e+01  1.041e+00 -36.551  < 2e-16 ***
## COVID          -6.675e+00  1.229e+00  -5.431 6.06e-08 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 13.89 on 2837 degrees of freedom
##   (12 observations deleted due to missingness)
## Multiple R-squared:  0.5909, Adjusted R-squared:  0.5888
## F-statistic: 273.2 on 15 and 2837 DF,  p-value: < 2.2e-16
```

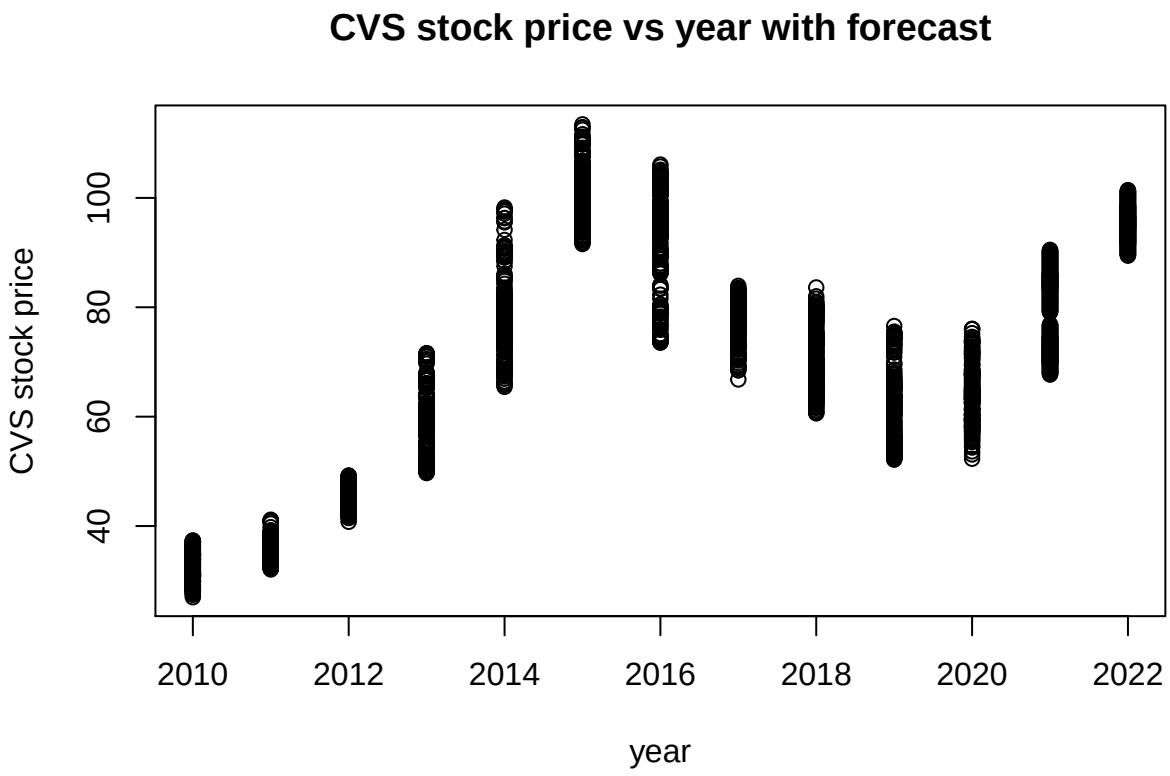
```
model_stock_price_2 <- lm(stock_price~t+year+quarter+Aetna+COVID,data=daily_10years)
summary(model_stock_price_2)
```

```
##
## Call:
## lm(formula = stock_price ~ t + year + quarter + Aetna + COVID,
##     data = daily_10years)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -35.083  -8.147  -3.724   7.836  41.023
##
## Coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)  2.704e+04  7.332e+03   3.689 0.000230 ***
## t            7.845e-02  1.394e-02   5.629 1.99e-08 ***
## year        -1.344e+01  3.648e+00  -3.684 0.000234 ***
## quarterq2   -4.937e+00  1.172e+00  -4.212 2.61e-05 ***
## quarterq3   -9.361e+00  1.965e+00  -4.763 2.01e-06 ***
## quarterq4   -1.229e+01  2.832e+00  -4.342 1.46e-05 ***
## Aetna       -3.871e+01  1.037e+00 -37.319  < 2e-16 ***
## COVID       -6.547e+00  1.233e+00  -5.308 1.19e-07 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 14.05 on 2845 degrees of freedom
##   (12 observations deleted due to missingness)
## Multiple R-squared:  0.5803, Adjusted R-squared:  0.5793
## F-statistic:   562 on 7 and 2845 DF,  p-value: < 2.2e-16
```

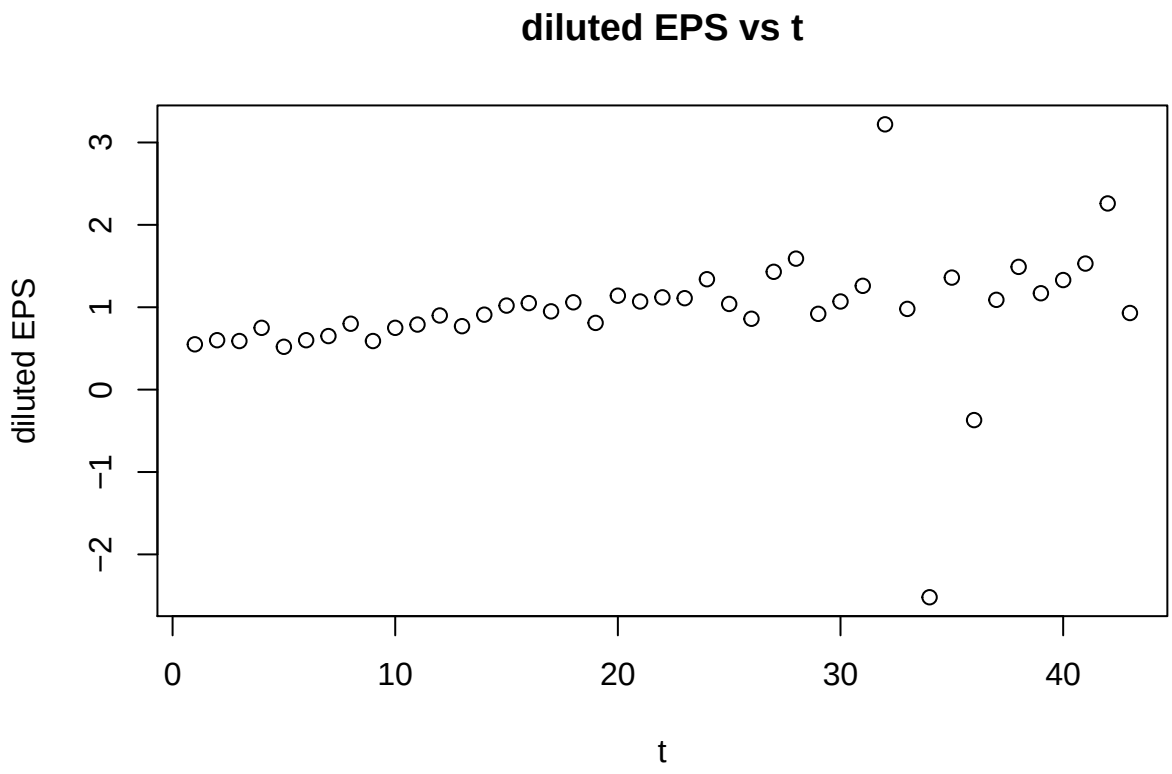
```
daily_newdates <- read_excel("daily_newdates.xlsx")
daily_newdates$stock_price <- predict(model_stock_price_2, newdata=daily_newdates)
daily_with_forecast <- rbind(daily_10years,daily_newdates)
plot(daily_with_forecast$stock_price~daily_with_forecast$t,
     xlab="t", ylab="CVS stock price", main="CVS stock price vs t with forecast")
```



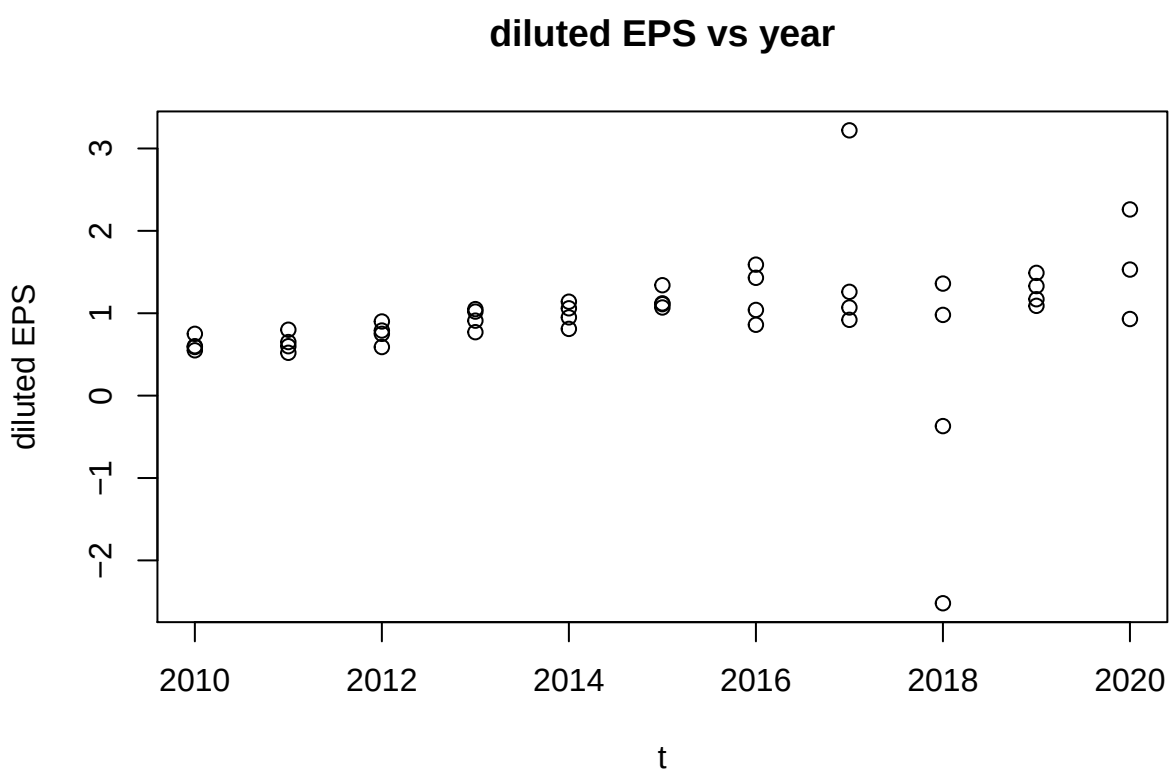

```
plot(daily_with_forecast$stock_price~daily_with_forecast$year,
     xlab="year", ylab="CVS stock price", main="CVS stock price vs year with forecast")
```




```r
library(readxl)
quarerly_10_years <- read_excel("quarerly_10 years.xlsx")
plot(quarerly_10_years$diluted_EPS~quarerly_10_years$t,
     xlab="t", ylab="diluted EPS", main="diluted EPS vs t")
```




```
plot(quarerly_10_years$diluted_EPS~quarerly_10_years$year,
     xlab="t", ylab="diluted EPS", main="diluted EPS vs year")
```


diluted EPS vs year
diluted EPS
3
2
1
0
−1
−2
2010
2012
2014
2016
2018
2020
t