

Comparison of the Effect of COVID-19 and H1N1 on Retail Sales

DataFest 2020 Team *GoDuck*

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BACKGROUND

As the COVID-19 crisis continues, the cease of global economy significantly changed people's spending behaviors as people are consuming less in the traditional brick-and-mortar shops due to the quarantine order. To have a better understanding of COVID-19's lengthy impact on the economy and its particular features, we estimate the March 2020 sales through Time Series analysis, comparing it with the actual retail sales in March. Then we duplicate the same analysis with H1N1(2009) pandemic and compare it with COVID-19.

FINDINGS AND INSIGHTS

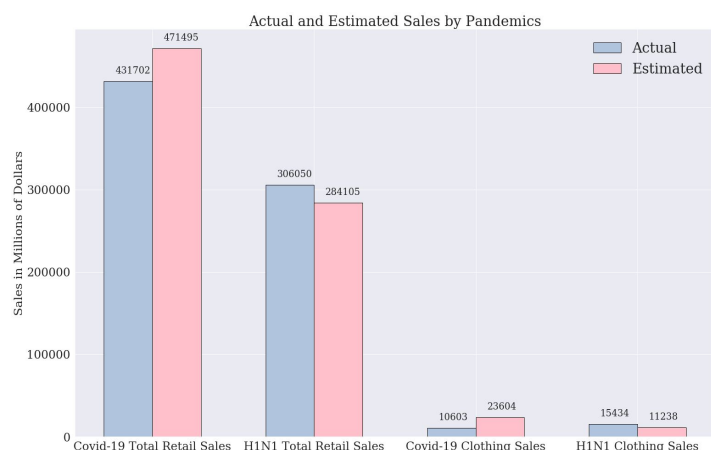


Figure 1

The U.S. economy is facing a severe crisis of drastically falling revenue, and we would like to take a closer examination at the scale of economic impact by comparing COVID-19 with H1N1. By evaluating the difference between the estimated total retail sales using time series models and the actual total retail sales during March 2020, as shown in Figure 1, we found that COVID-19 have unusually driven the sales down, while H1N1 had no negative influence on retail sales, which means COVID-19 is much more severe economically. Thus, we further looked at the data of percent change in individual consumption from 2019 to 2020, it is noticeable that people reduced their spending in almost every industry when COVID-19 became epidemic in March 2020.

As expected, the pandemic resulted in a slight rise in the sales of food and necessity industries, while other industries such as transportation and recreation services, food services, and motor vehicles are experiencing much lower sales than before. As shown in Figure 2, among all these industries, the clothing and footwear industry is unexpectedly impacted the most. In order to figure out if this a particular feature for this pandemic, we conducted time series analysis on revenue of clothing stores and compared the impact of COVID-19 and H1N1. During H1N1, the sales of clothing remained at a moderate level, so the current gloom of the clothing industry is exceptional.

Industry	2018Q1	2018Q2	2018Q3	2018Q4	2019Q1	2019Q2	2019Q3	2019Q4	2020Q1
Personal consumption expenditures (PCE)	1.7	4	3.5	1.4	1.1	4.6	3.2	1.8	-7.6
Goods	1.3	5.4	3.6	1.6	1.5	8.6	5.3	0.6	-1.3
Durable goods	2.3	8	3.6	1.3	0.3	13	8.1	2.8	-16.1
Motor vehicles and parts	-5.8	7.4	0.5	2.8	-10.2	16.1	2.5	5.5	-33.2
Furnishings and durable household equipment	4.5	4.7	5.5	-5.1	1.9	9	6	1.1	-6.4
Recreational goods and vehicles	8.9	9.1	6.6	1.9	12.4	17.7	17	2	0
Other durable goods	7.7	12.9	2.6	6.9	3	4.2	9	0.5	-14
Nondurable goods	0.7	4.1	3.6	1.7	2.2	6.5	3.9	-0.6	6.9
Food and beverages purchased for off-premises consumption	2.4	1.9	2.7	1.4	-1.7	5.3	5.5	-1.3	25.1
Clothing and footwear	-1.7	9.6	8.1	0	-3.8	14.5	-2.3	4.9	-36
Gasoline and other energy goods	-2.1	3.2	-2.5	2	0.5	1	-1	-2.2	-5.5
Other nondurable goods	1	4.4	4.9	2.5	8.2	6.5	6.1	-1.2	12.9
Services	1.9	3.4	3.4	1.4	1	2.8	2.2	2.4	-10.2
Household consumption expenditures (for services)	1.7	3	3.3	0.5	2.2	2.9	2.3	2.9	-11.9
Housing and utilities	0.4	2.3	0.6	0.9	0.1	1.1	2.3	0.4	0.6
Health care	1.7	3.5	5.3	-1.9	6.5	3.4	0.6	4.9	-18
Transportation services	5.7	-4.2	-0.7	-0.8	0.3	7.8	4.4	0.7	-29.2
Recreation services	6.1	6.3	0.9	3.2	-1	6.4	0.1	5.5	-31.9
Food services and accommodations	5.8	4.9	7.5	-2.4	-1.3	4.6	3.4	1	-29.7
Financial services and insurance	1	-0.8	0.9	1.8	2.8	1	2.3	3.8	2.8
Other services	-1.5	7.2	6.9	5.4	3.5	2.2	5.8	4.6	-4.3
Final consumption expenditures of nonprofit institutions serving households (NPISHs)(1)	5	12.1	6.1	20.3	-21.9	1.2	-0.9	-7.3	34.2
Gross output of nonprofit institutions(2)	-0.4	7.6	5.9	0.9	2.4	1.8	0	0.9	-0.9
Less: Receipts from sales of goods and services by nonprofit institutions(3)	-2.3	6	5.8	-5.8	13.6	2.1	0.3	4	-11.5
PCE excluding food and energy(4)	1.9	4	3.8	1.4	1.6	4.7	2.9	2.3	-9.9
Energy goods and services(5)	-3	8.4	-1.9	2.6	-3.8	0.9	5.4	-3.8	-4.9
Market-based PCE(6)	1.5	3.7	3.2	0.5	1.9	4.9	3.4	1.8	-9.3
Market-based PCE excluding food and energy(6)	1.7	3.6	3.5	0.3	2.5	5.1	3.1	2.5	-12.3

Figure 2

FURTHER CONSIDERATIONS

We assume several possibilities for the huge difference between the impact on COVID-19 and H1N1. Firstly, as population and transport-convenience boosting in recent years, the spread rate of COVID-19 is much greater, enhancing people's fearness. Secondly, due to quarantine, some industries have limited customers' buying channels especially clothing stores. Thus, a potential solution for retailing stores to increase their revenue is to switch to e-commerce and build a loyal customer base. Other industries can also address diverse purchasing channels in order to cater to future changes.

References:

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