Too Early to Reverse the Mask Requirements: more factors need to be considered

To: Your Client
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Executive Summary

In May 2021, the Centers for Disease Control(CDC) announced that people who had been fully vaccinated did not need to wear masks. Under the guidance of the CDC, some retail stores and companies in the United States lifted the mask requirements for vaccinated employees and customers. Taking Walmart as an example of the major retail stores in the United States, this memo finds that the reversal is related to the small increase in the number of consumers visiting Walmart stores nationwide by observing the daily data of foot traffic before and after the removal of the mask ban. Nevertheless, it is far from being enough to consider only mask policy in the change of customer shopping pattern. In order to further analyze the economic impact of the retail mask policies, this memo also needs to consider the impact of the roll back of mask mandates on consumers' shopping choices and the possible impact on public health. Since the CDC has revised its mask policy again at the end of July 2021, recommending that people who have been fully vaccinated with the COVID-19 vaccine should wear masks in indoor public places as well. As a result, it is more imperative to study the impact of the mask policy on society, which beneficial for the governments, policy makers and the retailers to determine how and when the mask restrictions need to be lifted or readopt.

Background & Methodology

The background of this memo is based on the reversal of the mask requirements by major supermarkets and companies in May 2021 to study the impact of this policy on US economic activities. This memo addresses this question by analyzing the foot traffic data of Walmart's 4,627 stores in various states in the United States from May 1 to May 31, 2021. The reason why this memo chooses Walmart as an example to study the impact of mask policy lies in Walmart's market dominance in the United States and its wide geographic scope. Walmart has cancelled its requirement to wear masks in stores for all fully vaccinated customers from May 18, 2021. At the same time, some other US companies have also made similar decisions. For customers, the non-mandatory requirement to wear masks meant that the pandemic was getting better. Some customers thought shopping in person was both convenient and safe, while others thought there were still risks when going out to shop in person. In the context of the policy aimed to the pandemic, this memo researches on the changes in customer flow before and after the reversal of the policy, as well as factors such as partisanship and vaccine hesitancy to study its impact on consumer behavior, thereby indicating the economic development trends.

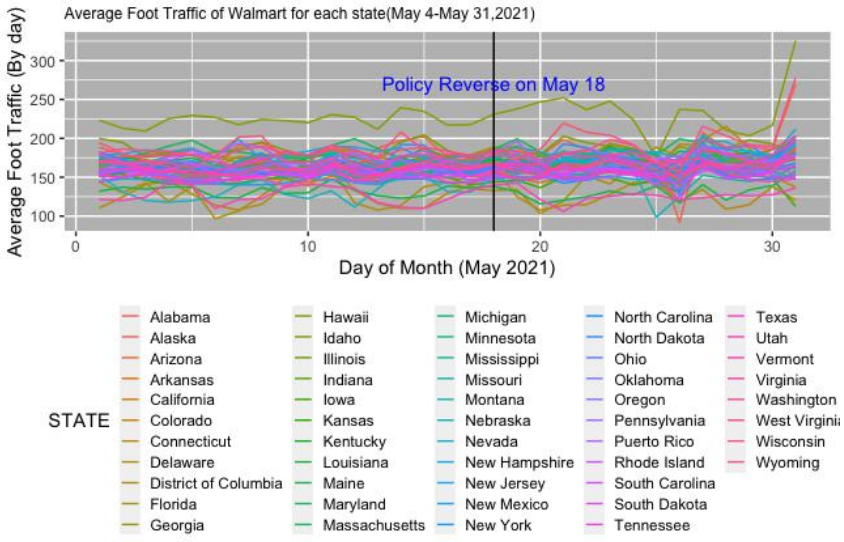
Analysis

The evaluation of the 14 days' average daily customer flow of Walmart stores in the United States in May 2021 before and after the policy change shows higher daily average customer flow after the policy change(shown in Figure1). However, the daily average customer flow does not have a continuous upward trend and fluctuates violently, which cannot indicate that the policy change has a positive correlation with economic activities. Moreover, the increase in the daily average customer flow peak after the policy change exists contingency which can be explained by weekends or holidays contingency.

Figure 1 Average Foot Traffic(By day) in Walmart Stores(May 4-May 31,2021)

Reviewing the average daily foot traffic of the Walmart stores in different states in the United States, this memo find that most states' average daily foot traffic trend (excluding the outlier value of Hawaii) is similar(shown in Figure2). At the same time, the most obvious rise or fall in the data almost occur around the weekend and the end of May, which can also be explained by contingency factors such as weekends or holidays.

Figure 2 Average Foot Traffic of Walmart for each state (May 4-May 31,2021)



This memo also uses a linear regression model to simulate the impact of mask policy changes on expected daily visitors in all the Walmart stores. The results from Table 1 show that after the policy changes, we estimate that the expected number of daily visitors to Walmart stores will be a small growth but statistically significant. However, considering only the data relationships in Table 1,2 and 3, it is concluded that the impact of policy reversal on daily customer flow in counties with different vaccine hesitation rates and party affiliations is limited. Besides the Republican partisanship, this memo also studies the effect of policy reversal on daily customer flow under the influence of Democratic partisanship in Table 4 to illustrate the influence of party relations on daily passenger flow before and after the policy reversal. Moreover, we also study the effect of policy reversal on daily customer flow in counties with high vaccine hesitation rates in Table 5. According to the data in Tables 2 and 4, the interaction between the mask policy change and partisanship shows that neither Republican nor Democratic partisanship significantly explained the number of daily visitors. And according to the data in Tables 3 and 5, the interaction between the mask policy change and vaccinate hesitancy also explains very little of the variation we see in our data. However, we do observe that vaccine hesitancy rates are positively and significantly correlated with the number of daily customers. And we again see a small but statistically significant increase in the expected number of daily customers in counties with higher proportions of vaccine hesitancy, which is further to show that there is a small but existed positive correlation between vaccine hesitation and willingness to shop in person.

Table 1 Linear Regression 1[1]

Daily Walmart Visitors	Coefficients	Std.Error	t value	Pr(>| t |)	Signif
Mask Reversal	3.5242	0.5197	6.781	0.000	***
Constant	162.2294	0.3460	468.834	0.000	***
Observations					141301
Residual standard error					97.05(df=141299)
Multiple R-squared	0.0003	Adjusted R-squared			0.0003
F-statistic	45.99 (df=1;141299)	p-value			0.000

*** p<0.01, ** p<0.05, * p<0.1

Table 2 Linear Regression 2[2]

Daily Walmart Visitors	Coefficients	Std.Error	t value	Pr(>| t |)	Signif
Mask Reversal	5.3209	1.8678	2.848	0.005	***
Rep.Partisanship	-0.0293	0.0220	-1.312	0.190	
Rep.Partisanship: Mask Reversal	-0.0333	0.0333	-0.994	0.321	
Constant	163.7612	1.2441	131.650	0.000	***

[1] Table 1 explains the regression results of the reversal of the mask policy on Walmart's daily customer flow.

[2] Table 2 explains the regression results of the reversal of the mask policy on Walmart's daily customer flow under the influence of the Republican party.

Observations			140278
Residual standard error			97.07(df=140274)
Multiple R-squared	0.0004	Adjusted R-squared	0.0004
F-statistic	17.98 (df=3;140274)	p-value	0.000

*** p<0.01, ** p<0.05, * p<0.1

Table 3 Linear Regression 3[3]

Daily Walmart Visitors	Coefficients	Std.Error	t value	Pr(>| t |)	Signif
Mask Reversal	4.5156	2.2011	2.052	0.041	**
Vaccine Hesitancy	0.5500	0.0800	6.908	0.000	***
Vaccine Hesitancy: Mask Reversal	-0.0550	0.1200	-0.463	0.644	
Constant	152.3860	1.4650	104.032	0.000	***

Observations			140490
Residual standard error			97.06(df=140486)
Multiple R-squared	0.001	Adjusted R-squared	0.001
F-statistic	41.46 (df=3;140486)	p-value	0.000

*** p<0.01, ** p<0.05, * p<0.1

Table 4 Linear Regression 4[4]

Daily Walmart Visitors	Coefficients	Std.Error	t value	Pr(>| t |)	Signif
Mask Reversal	2.1060	1.5712	1.341	0.181	
Dem.Partisanship	0.0410	0.0220	1.818	0.069	*
Dem.Partisanship: Mask Reversal	0.0320	0.0330	0.966	0.335	
Constant	160.3990	1.0471	153.240	0.000	***

Observations			140278
Residual standard error			97.07(df=140274)
Multiple R-squared	0.0004	Adjusted R-squared	0.0004
F-statistic	19.26 (df=3;140274)	p-value	0.000

*** p<0.01, ** p<0.05, * p<0.1

Table 5 Linear Regression 5[5]

Daily Walmart Visitors	Coefficients	Std.Error	t value	Pr(>| t |)	Signif
High Vaccine Hesitancy	0.5260	0.0590	8.854	0.000	***

[3] Table 3 explains the regression results of the reversal of the mask policy on Walmart's daily customer flow under the influence of vaccine hesitation rate

[4] Table 4 explains the regression results of the reversal of the mask policy on Walmart's daily customer flow under the influence of the Democracy party

[5] Table 5 explains the regression results of the reversal of the mask policy in counties with high vaccine hesitation on Walmart's daily customer flow

Constant	154.3770	1.0931	141.190	0.000	***
Observations					140490
Residual standard error					97.07(df=140488)
Multiple R-squared	0.001	Adjusted R-squared			0.001
F-statistic	78.40 (df=1;140488)	p-value			0.000

*** p<0.01, ** p<0.05, * p<0.1

Recommendations

This policy change is limited in the interpretation of economic changes, and we cannot explain its impact on the overall economy through a single policy change. Even if it has a small growth effect on the economy, the impact of other factors on the economy cannot be completely ruled out. A more accurate and comprehensive observation on the economic impact of the mask policy asks us to use larger-scale data and consider the impact of other factors on consumers' shopping behaviors in addition to partisan bias and vaccine hesitation.

Conclusion

This memo find that at the national level, changes in mask policies are related to a small increase in the number of daily customers in Walmart stores. Moreover, it also shows that economic activity at the national level will not increase or decrease substantially only because of this policy change. This policy change also cannot fully explain the observed changes in the number of daily customers. Under the pandemic, consumers' shopping patterns may have been relatively established, regardless of the actual level of risk. Whether consumers choose to shop in person may depend on their perceived risks and the actual pandemic situation of the country.

Although the mask policy has little impact on daily customers, this policy change can be further to explore the impact of such policies on economic activities and public health. The fact that we have observed is that there is a small but statistically significant positive correlation between vaccine hesitation and daily customers to Walmart stores, which can also assess the relationship between vaccine hesitation and the behavior of voluntary use of masks. The public health risks caused by this policy change may depend on how many unvaccinated individuals choose to wear masks and the local vaccination rate. In addition, retailers should consider the vaccination condition of their employees and their implementation of such policies. Nowadays, as retailers begin to readopt mask requirements, governments, policy makers and retailers need to further analyze consumer responses to policies and the possible consequences of their reactions for economic activities and public health. From what we've seen so far, it is still too early to reserve the mask requirements.