



COVID-19 update: NY Gov. Cuomo advances the timeline to re-open. Testing 3x = cases up. HY issuance 2nd strongest week ever

THIS MESSAGE IS BEING SENT SOLELY TO CLIENTS OF FS INSIGHT

The developments over the weekend have been mostly positive. Most notably, it looks like the improvements for NY state have been sustained sufficiently for Gov Cuomo to mention that some parts of the state may open after May 15th. This is quite a milestone. Now the phased opening would be for manufacturing and construction and more likely in Upstate and Central NY. Not NYC at this time. NYC with >18,000 cases per 1mm residents did 3X worse than Lombardy, Italy (see chart below). Recall, Italy was the first developed nation to see a COVID-19 outbreak and the northern region was overwhelmed. Yet, NYC managed to see confirmed case prevalence 3X worse than Lombardy.

But the other development over the past few days has been a significant increase in US testing to about 300,000 per day, 3X what it was just a week ago. And this figure could surge in coming weeks as more testing capabilities and capacity are added. But the consequence of this is "confirmed cases" are surging. Over the weekend, the US reported 35,780 net new cases (4/25/2020) which exceeds the 34,298 high on 4/10/2020.

We had several clients email over the weekend asking if a new wave of cases is taking place. But as we discuss below, this surge is due to 3X rise in tests and in fact, NY state accounts for almost half of the surge. And NY is certainly not getting worse, because Gov. Cuomo is advancing the timeline.

And as for equity markets, we continue to believe HY is a leading indicator of risk appetite. HY managed to price \$20.6 billion in bonds last week (2nd highest EVER for that market) and saw \$2.2 billion of inflows. All of this despite the catastrophic crash in May WTI futures (20% of HY is energy). The fact that HY was only modestly "nicked" by the oil Armageddon should be clue.

We believe HY is underscoring the fact that the balance of power in risky assets, and stocks, has shifted into the hands of buyers ("half full"). And the market is telling us that stocks/EPS recovery likely follow a path that is lot steeper than consensus expects (we will have more insights over the coming week).

POINT #1: Governor Cuomo looks like he is advancing timeline to re-open NY State to sometime after May 15th...

Governor Cuomo even advanced the timetable to re-open NY state, sometime after May 15th with upstate and central NY first

In his press briefing yesterday, Governor Cuomo talked about how NY state continues to make good progress, sufficiently, actually that the state is somewhat advancing the timeline to re-open NY state. Cuomo advanced the timetable for a phase re-opening of NY state, to sometime after mid-May with Upstate and Central opening before NYC.

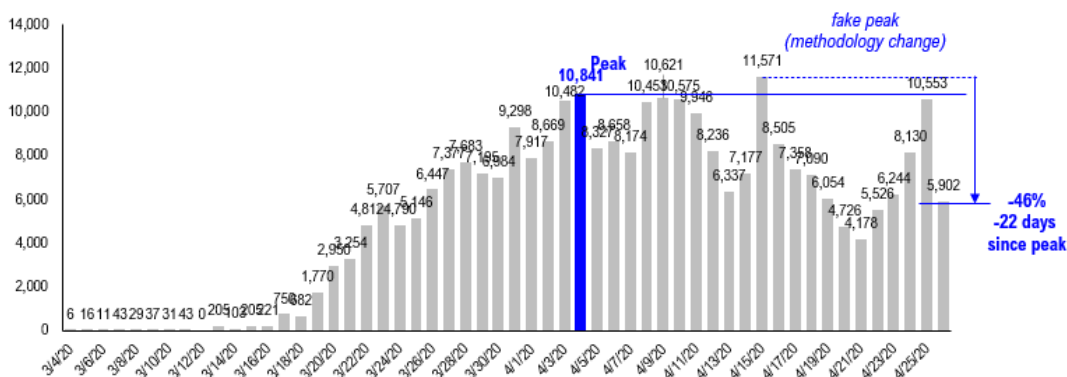
- the first phase is to resume construction and manufacturing jobs.
- the second phase, open additional "essential businesses"
- 14 days would separate the two.
- **Schools would need to re-open if NY is going to have large-scale re-opening. Schools may have "summer sessions" to make up for lost time.**

In each case, the organizations/entities need to create mitigation plans that meet the state requirements (not yet set).



New York state cases surged recently, not really due to a "new outbreak" but expanded testing... 3X increased testing past 5 days

Over the weekend, we saw some big increases in cases reported by NY state. Below, cases surged to 10,553 on 4/25/2020, following 5 consecutive days of higher reported cases (4,178 on 4/21/2020, see below). And then on 4/26/2020, this figure fell to 5,902. If methodology and testing capacity and timing were all constant, this would be an alarming jump.



Source: NY state

New York state since 4/21/2020 has seen a tripling of tests from 15,464 to 46,912 and the cases reported positive proportionately tripled as well. This is the best explanation for why the case numbers have surged in NY state in the past few days.

- But take a look at 4/26/2020 figure. Tests were 27,782 (+80% from 4/21/2020) but new cases were only +40% (5,902 vs 4,178).
- The positive as % total tests is actually falling and is now 21% from 27% 5 days ago.

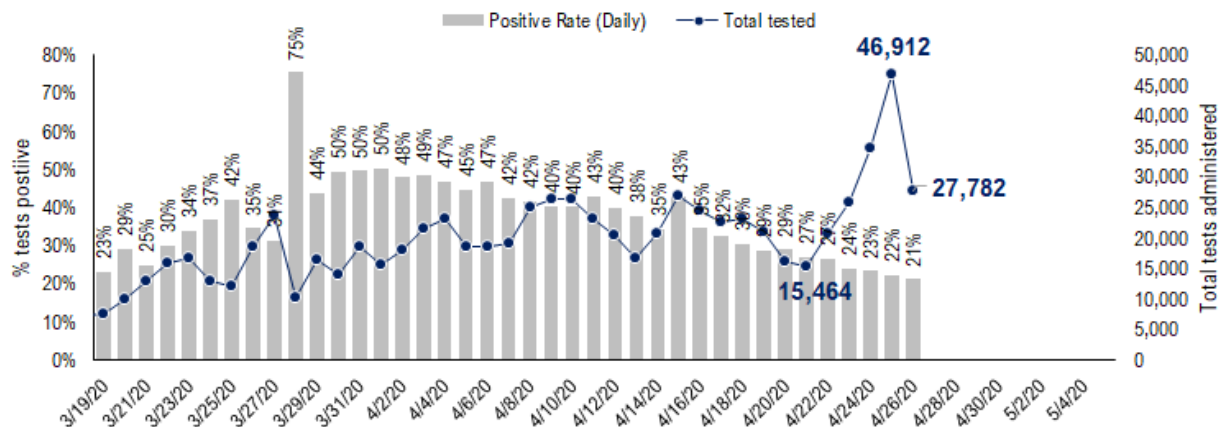
Date	Total tested	positive	Positive Rate (Daily)
4/21/2020	15,464	4,178	27.0%
4/22/2020	20,657	5,526	26.8%
4/23/2020	25,938	6,244	24.1%
4/24/2020	34,736	8,130	23.4%
4/25/2020	46,912	10,553	22.5%
4/26/2020	27,782	5,902	21.2%

Note: Blue arrows and '3X' indicate a threefold increase in both total tests and positive cases from 4/21/2020 to 4/25/2020. A 'down' label is next to the 21.2% rate on 4/26/2020.

source: NY state

The best evidence perhaps NY state is improving, is the fact that % positive tests is falling and down to 21% (lowest ever)...

The percent of NY state COVID-19 tests positive is 21% on the most recent date, which is the lowest figure since the data has been available. This figure peaked at 50% (one day spike to 75%) and has steadily improved. This may be the best evidence that NY state is past the apex in cases.

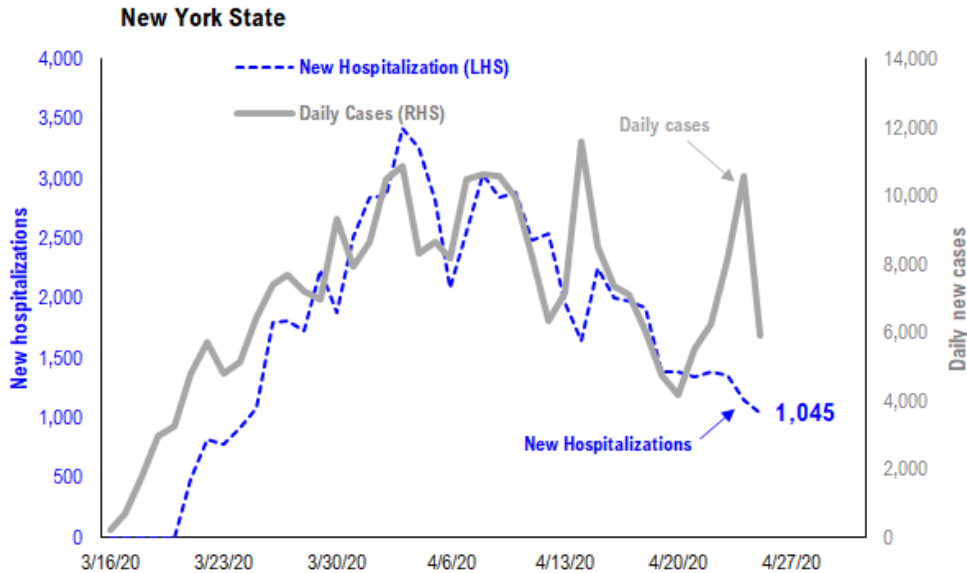


source: NY state

New York state hospitalizations and net hospitalizations down... even as COVID-19 cases remain high, fewer need hospitalization

NY State new hospitalizations continue to trend lower. The most recent figure is 1,045 which is the lowest number since 3/25/2020. That remains a pretty high number, actually.

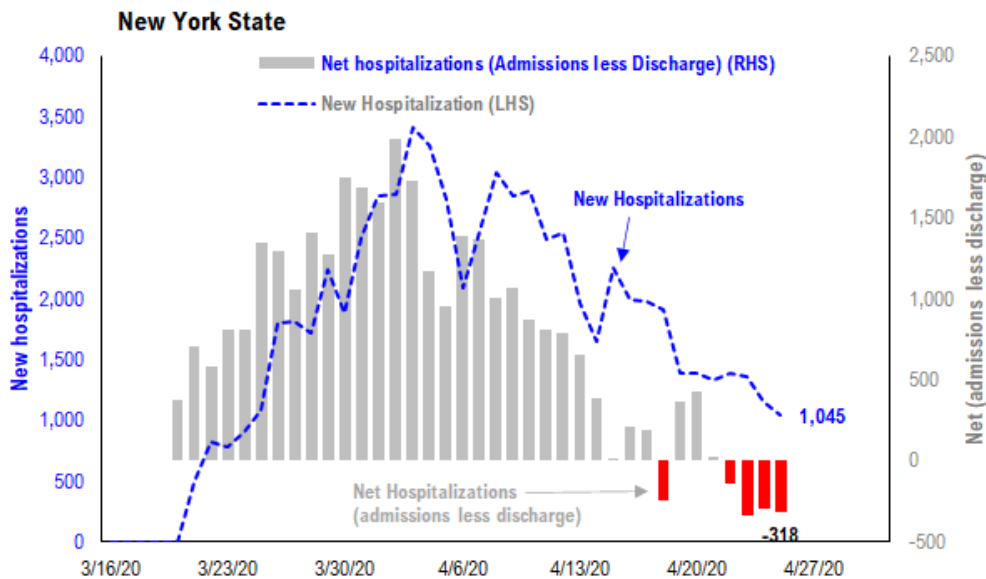
- But 1,045 is way from 3,500 reported 4/3/2020. Down 71%.
- This is one of the reasons, we believe, Gov. Cuomo feels the timeline to re-open NY can advance.



source: NY state

For each of the past 4 days, NY state has discharged more COVID-19 patients than admitted...

The figure for "net hospitalizations" is even more encouraging. The state has discharged more patients in each of the last 4 days. In fact, the state has been essentially "net discharging" since 4/18. Or the last 8 days.



source: NY state

POINT #2: NYC/Westchester fared worse than Lombardy, Italy. US new cases surge over

weekend, as testing tripled 3X

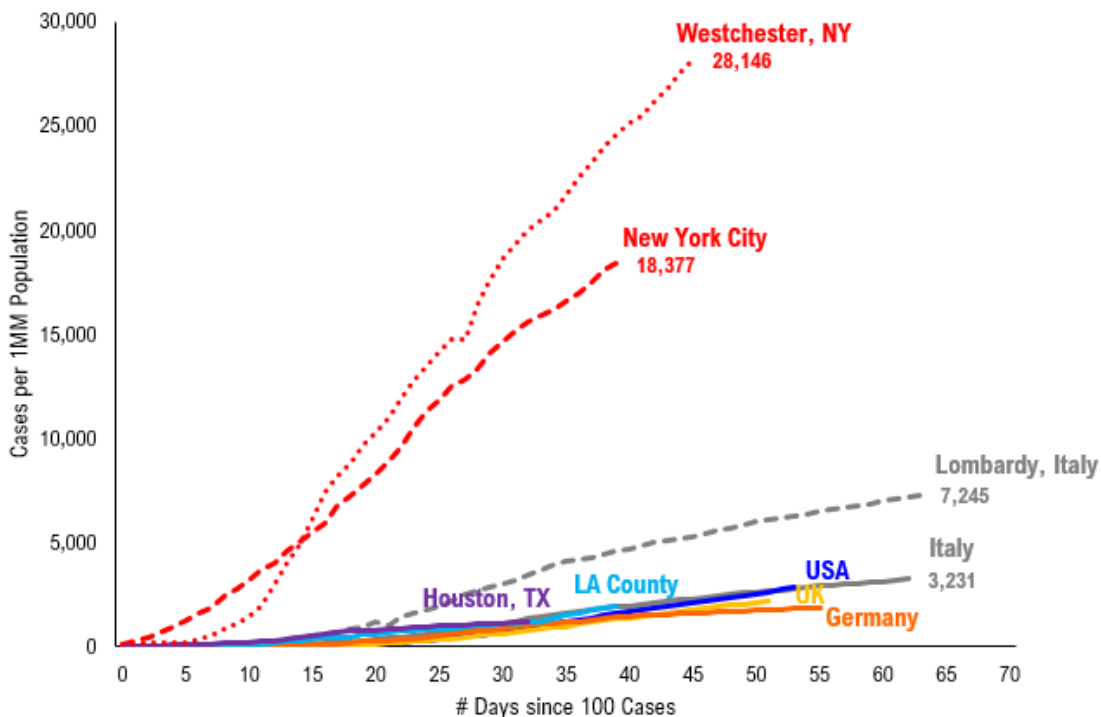
As NYC/NY seem to have passed the apex of the crisis (not just cases, but as measured by the constellation of factors of hospitalizations, new cases and deaths), it might be helpful to see how NYC fared vs Lombardy, Italy (which at one point, was where the worst outbreak took place). The chart below puts this in perspective.

- NYC fared far worse than Lombardy, Italy with 18,377 cases per 1mm residents vs 7,245 for Lombardy, or nearly 3X the level of cases.
- Westchester County fared even worse with 28,146 cases per 1mm residents, or 4X Lombardy.

Italy was thought to be hard hit because of the high number of China nationals, plus the football match (w/Spain) and with the effect of multi-generational families. The worst possible factors.

Yet, someone NYC/Westchester was 3X-4X worse than Lombardy. Again, this is one of those puzzles that really remains incongruous from what we can see.

In fact, as you can see below, the rest of the US, rest of Europe and even cities like Los Angeles and Houston are in a very different trajectory/COVID-19 prevalence compared to NYC.

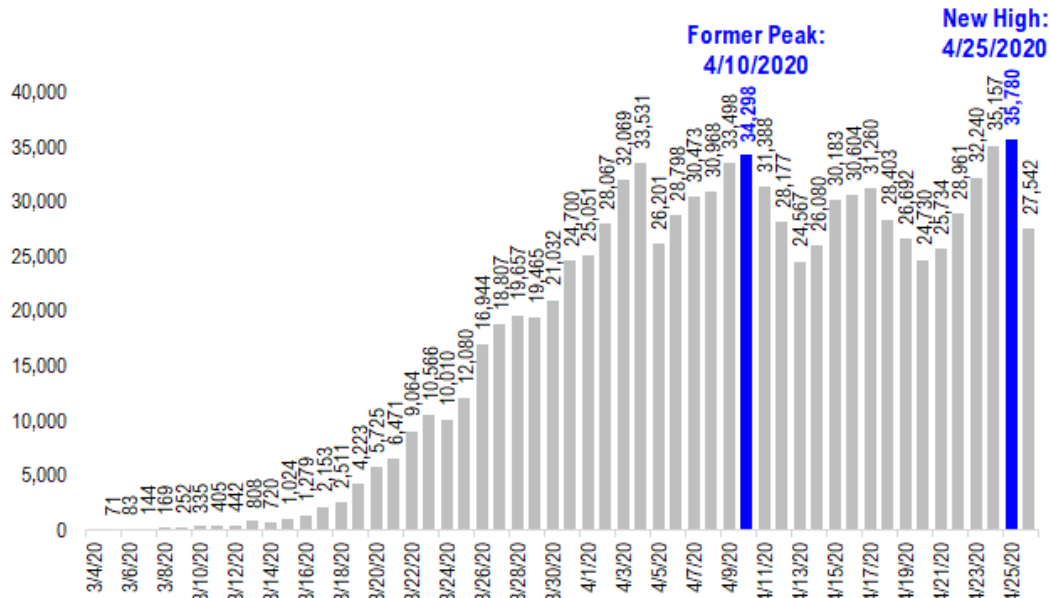


Source: Fundstrat, NYC.gov, Johns Hopkins CSSE, COVID-19 Tracking Project, Ministry of Health of Italy

US Daily cases surge to new highs over the weekend, as testing has 3X to 300,000 per day...

The US also reported a new high in cases at 35,780 surpassing the prior peak of 34,298 on 4/10/2020. As shown below, daily new cases were trending lower but surged in the past 5 days.

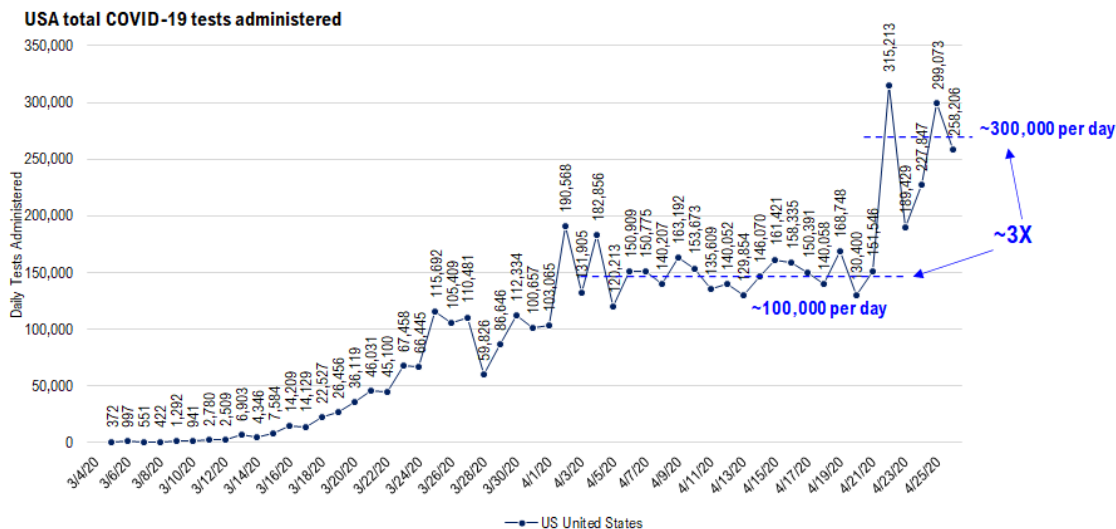
There are some who are going to suggest a "new wave" is happening and there is a breakout as people have ventured outside as the weather improved. This is certainly a possibility. But we believe the rise in reported cases is more a function of a surge in testing.



Source: Fundstrat, Johns Hopkins CSSE, COVID-19 Tracking Project

US tests have surged to 300,000 per day in the past 5 days compared to 100,000 per day from April 1 to April 21...

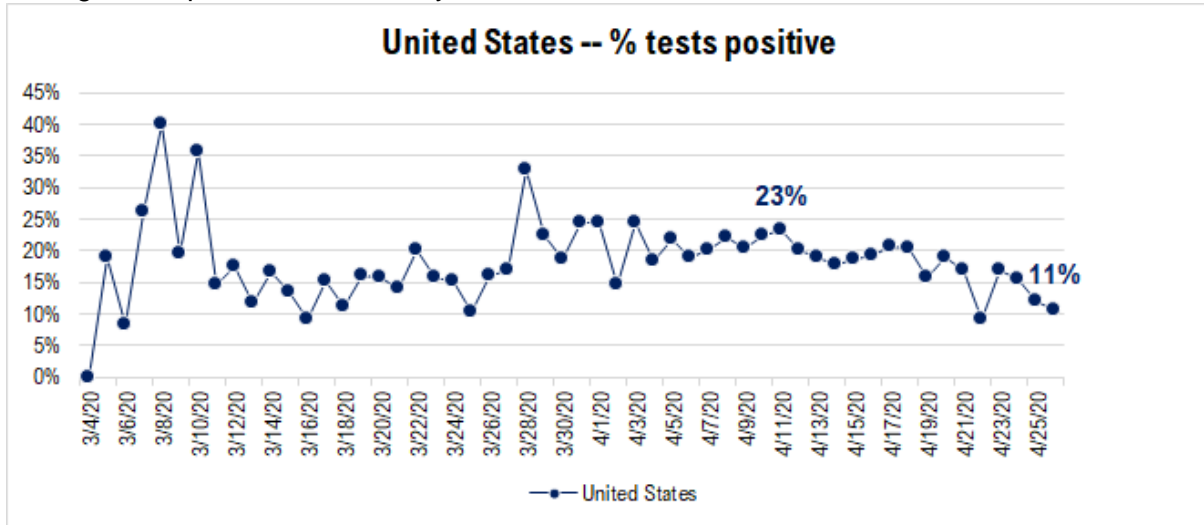
There has been a rise in daily tests administered in the US to about 300,000 per day, triple what it was for most of April. Testing will continue to expand as the National Governors Association (NGA) would like daily testing to be >1 million per day. Or at least 3X more than it is currently.



Source: Fundstrat, Johns Hopkins CSSE, COVID-19 Tracking Project

The good news is the percentage of tests that are positive is generally trending lower and is around 11% currently. That means 9 of 10 tested for COVID-19 are negative. That is a pretty high figure.

- And eyeballing this chart since early March, it does seem like it is trending lower, even as testing has expanded dramatically.



Source: Fundstrat, Johns Hopkins CSSE, COVID-19 Tracking Project

Much of the increase in reported cases is due to NY state (where cases were +5,000 higher over a period of a few days). And we discussed how the 3X of testing in NY state happened during that period of time. But with testing expanding, more cases will be detected.

That is a good thing. But the overall reported cases will rise and this rise is not necessarily a rise in transmission spread (R0) or in a new wave happening in a new region or even in a existing outbreak. I think this is important to keep in mind.

Daily Case Increases (by State) (04/26)

% total new cases (state cases/ total US cases)

% total US pop (state population/ total US population)

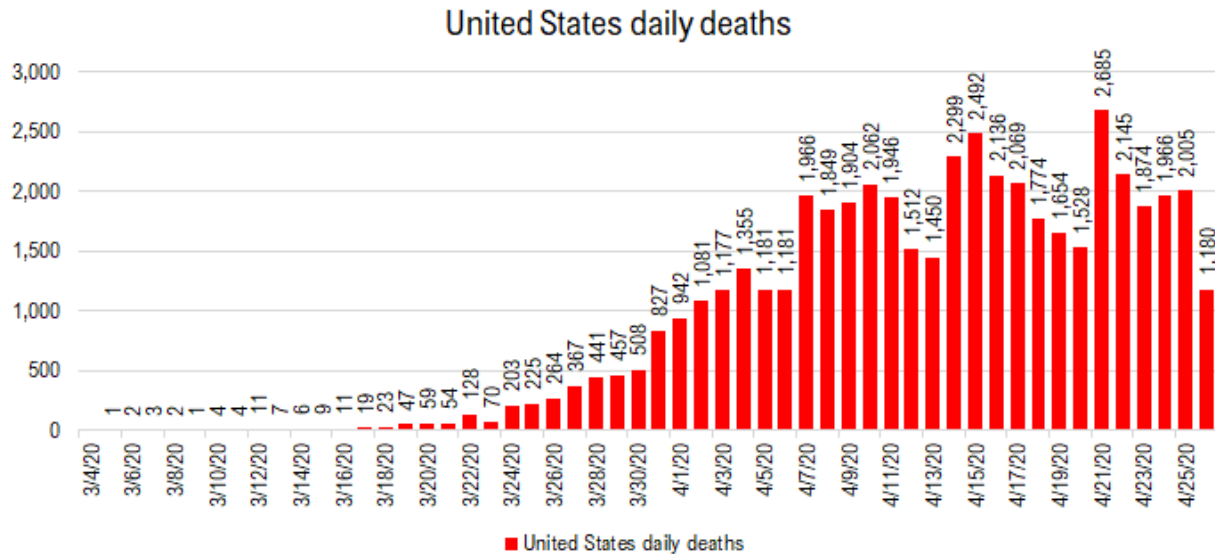
		<i>Sorted</i>		
		Last 3-day trend growth rates		
		4/24/20	4/25/20	4/26/20
	United States	35,157	35,780	27,542
	States:			
1	New York	8,130	10,553	5,902
2	New Jersey	2,207	3,327	3,515 <-higher
3	Illinois	2,724	2,119	2,126
4	Massachusetts	4,946	2,379	1,590
5	Pennsylvania	1,599	1,397	1,116
6	California	1,885	1,883	1,027
7	Texas	862	967	858
8	Maryland	879	1,150	815
9	Colorado	384	994	712
10	Georgia	635	548	706 <-higher
11	Florida	526	665	689 <-higher
12	Connecticut	821	661	687
13	Indiana	641	715	617
14	Virginia	542	733	586
15	Michigan	1,350	562	575
16	Tennessee	460	463	478 <-higher
17	Delaware	134	134	458
18	Iowa	521	647	384
19	Ohio	439	402	377
20	Washington	259	224	342
21	Nebraska	311	297	311
22	Rhode Island	443	430	310
23	Kentucky	108	298	295
24	Alabama	54	305	281
25	Louisiana	401	372	261
26	Arizona	276	235	246
27	South Carolina	153	183	237
28	Wisconsin	304	331	224
29	North Carolina	444	571	207
30	Mississippi	281	284	193
31	Utah	170	166	175
32	Missouri	304	201	171
33	Minnesota	243	261	156
34	District of Columbia	167	171	142
35	Kansas	295	279	118
36	Arkansas	276	89	111
37	New Hampshire	50	67	77

Source: Fundstrat, Johns Hopkins CSSE, COVID-19 Tracking Project

The trend in deaths is also improving as total deaths reported on 4/26/2020 is back to levels seen in early April...

The reported COVID-19 deaths are also improving and at 1,180 is down from a horrifically high 2,685 seen just 6 days ago. For the country as a whole to have a sense for the crisis to diminish, daily reported deaths do need to consistently improve.

- By this measure, staying at the 1,000 level, or even falling below 1,000 would be progress, considering the 2,000-ish level seen for much of April.



Source: Fundstrat, Johns Hopkins CSSE, COVID-19 Tracking Project

POINT #3: The first states moved to re-open the economy over the weekend. 13 states announce plans (ex-NY), ~27% of GDP.

Away from NY state, the COVID-19 crisis has not hit other states nearly as badly (NJ got hit hard) and in fact, 13 states have announced tentative plans to re-open the economy. It sounds like Gov. Cuomo is about to set a date for NY state and if he does, it will be the second largest state to announce re-opening plans after Texas (which has "phased openings" planned).

- this weekend, Georgia moved to open several businesses, including hair salons and other non-essential businesses.
- Georgia cases are only modestly off their peak, so the state is somewhat aggressive in its move.

Whether Georgia is making a wise decision will only be known with the passage of time. But it is also too simplistic for critics to argue that states cannot open until cases fall to zero. If states had to wait that long, the US economy would be decimated.

Moreover, NYC's continued high daily reported cases seems to counter the suggestion social distance and stay at home will eradicate COVID-19. The city has seen the same level of reported cases for weeks now. And the serological tests for NYC show the prevalence of COVID-19 is potentially 13X what is reported.

If Georgia does not see an outbreak, this will suggest mitigation measures plus social distance plus hygiene and sanitation may be factors that keep COVID-19 controlled, and without the need for "shelter at home" requirements. In that sense, it would be positive if Georgia does not see a new surge in cases.

State	Date	Tentative plan	GDP impact		Cases/ 1mm	Daily new cases (3-day Average)		
			State GDP	as % US	Current	Recent	% off peak	Days past peak
Composite States opening up				27.3%				
Idaho	4/17/2020	Gov. Little amended his order which allows any business, facility or service to open for curbside and delivery service. Further, businesses can now prepare to open their doors after April 30 as long as they make preparations to meet criteria.	\$77	0.4%	989	43	-73%	19
Vermont	4/20/2020	Gov. Phil Scott on Friday announced the initial steps that his administration is taking to reopen Vermont's economy	\$33	0.2%	1,317	3	-95%	18
Montana	4/24/2020	Gov. Steve Bullock said Friday he plans to begin a phased re-opening the state's economy	\$50	0.2%	411	3	-89%	25
Georgia	4/24/2020	4/24: fitness centers, bowling alleys, body art studios, barbers, hair and nail salons, and massage therapy businesses. 4/27: Theaters and restaurants	\$592	2.9%	1,951	855	-21%	15
Colorado	4/26/2020	Gov. Polis outlines initial plan for lifting some restrictions, allowing certain businesses to reopen	\$372	1.8%	1,819	383	-14%	13
Texas	4/27/2020	Gov George Abbott "phased opening"	\$1,803	8.8%	727	829	-27%	13
Michigan	5/1/2020	Gov. Whitmer wants "steps forward"	\$527	2.6%	3,412	1097	-9%	7
Ohio	5/1/2020	Gov. Mike DeWine (R) will begin the process of reopening	\$676	3.3%	1,169	542	-56%	3
Tennessee	5/1/2020	Gov. Bill Lee announced the order for Tennesseans to remain at home will expire April 30, with the vast majority of businesses in 89 counties allowed to re-open on May 1.	\$364	1.8%	1,147	343	-10%	22
Virginia	5/8/2020	Gov. Northam unveils blueprint for easing public health restrictions. His executive order extending non-essential business closures is set to expire May 8, 2020.	\$533	2.6%	1,173	546	-1%	4
Maryland	Early May	Gov. Hogan today (4/24) introduced a three-stage plan - 'Maryland Strong: Roadmap to Recovery,' which provides a safe, effective, and gradual approach to reopening the state as it continues to combat the COVID-19 pandemic.	\$413	2.0%	2,465	684	-21%	13
Arkansas	No Stay-at-Home Order	Gov. Hutchinson defended his decision not to issue a statewide stay-at-home order and said that his "targeted approach" has proven to be effective.	\$128	0.6%	770	181	-	-
South Dakota	No Stay-at-Home Order	Although schools have been closed since March 16, Gov. Noem has not closed businesses or banned public gatherings.	\$52	0.3%	2,098	90	-39%	7

Source: Fundstrat

There was some reporting of Georgia re-opening over the weekend, including this article below about hair salons opening. The hair salon Three-13 Salon took cues from Asia, with customer temperatures being taken before entering.



Tracy Collie styles Roberta Skivicki's hair at Three-13 Salon, Spa and Boutique, during the phased reopening of businesses and restaurants from coronavirus disease (COVID-19) restrictions in the state, in Marietta, Georgia, U.S., April 24, 2020. REUTERS/Bita Honarvar

<https://www.reuters.com/article/us-health-coronavirus-usa-spa/as-georgia-re-opens-an-atlanta-area-salon-tests-limits-of-social-distancing-idUSKCN226375>

Similarly, the NY Times had an article about how restauranteurs are thinking what a safe dining experience is, including managing tables, sanitation procedures, how to handle menus and all the various processes in a restaurant.



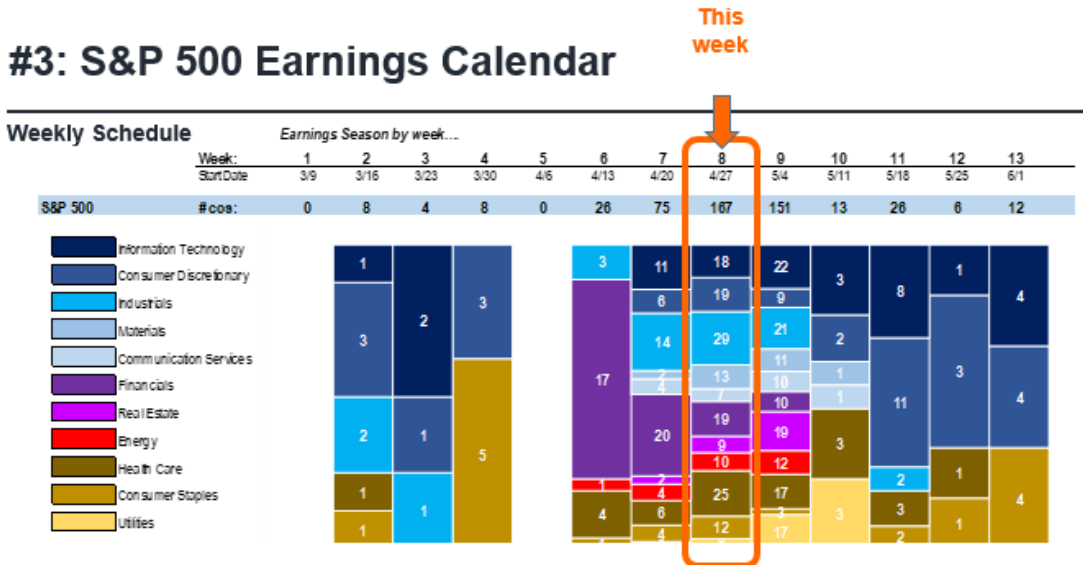
The chef David Chang has looked to Asian countries to find the best safety protocols for the day when he can reopen his restaurants. Josh Haner/The New York Times

<https://www.nytimes.com/2020/04/26/dining/restaurants-open-coronavirus.html?referringSource=articleShare>

POINT #4: Earnings seasons has taken a back seat but this is the heaviest week of 1Q2020 earnings reports.

We are now in the busiest part of the earnings season with 167 companies set to report this week. Among them are 19 Consumer Discretionary stocks (in S&P 500) which is the most of any week. And a very heavy slate of Industrials (29 this week).

#3: S&P 500 Earnings Calendar



Source: Fundstrat

Earnings missing by 19% but topline by 1% and Defensives see EPS growth of 6%

Earnings are not surprisingly missing by 19%, but topline overall is missing by a modest 1% overall. Of the 120 which have reported results so far, only 44% are beating. Again, this is not a surprise. Within Defensives, 68% are beating and by a pretty large margin (+670bp).

1Q2020 and 2Q2020 EPS are not expected to be strong quarters -- with the global economy shutdown, businesses will naturally report significant losses.

- But every recession is a chance for a business to re-engineer costs. Thus, we believe companies will have V-shaped EPS recoveries post-pandemic trough.

#1: S&P 500 Earnings Analysis

1Q20 Street Consensus EPS	
As of 3/31/20	\$36.60
Current	\$32.89
% change	-10.1%

Blended Y/Y growth includes actuals for companies that have reported, and estimates for companies that have yet to report.

Figure: S&P 500 1Q20 Reported Earnings

Bottom-up based on constituents

Sector name	# cos reported	% cos reported	1Q20 Earnings results relative to consensus (bottom up)				Relative return since 3/31/20
			% cos beating	% cos missing	Surprise (%)		
S&P 500 (absolute)	120 / 500	24%	44%	55%	-18.7%	8.2%	
Cyclicals	51 / 255	20%	53%	47%	-1.0%	0.4%	
Near-Cyclicals	44 / 124	35%	20%	77%	-45.2%	-2.3%	
Defensives	25 / 121	21%	68%	32%	6.7%	0.7%	
Technology	14 / 71	20%	64%	36%	6.3%	-0.3%	
Consumer Discretionary	13 / 62	21%	38%	62%	-19.1%	6.4%	
Industrials	20 / 72	28%	60%	40%	-4.1%	-4.8%	
Basic Materials	1 / 28	4%	0%	100%	4.0%	0.7%	
Communication Services	3 / 22	14%	33%	67%	-2.3%	0.1%	
Financials	36 / 66	55%	17%	83%	-46.9%	-5.4%	
Real Estate	3 / 31	10%	67%	0%	4.1%	-2.1%	
Energy	5 / 27	19%	20%	80%	-19.7%	9.9%	
Healthcare	11 / 60	18%	55%	45%	4.3%	3.3%	
Consumer Staples	12 / 33	36%	75%	25%	9.5%	-2.0%	
Utilities	2 / 28	7%	100%	0%	12.5%	-3.8%	

Source: Fundstrat, FactSet, Bloomberg.

Note: "Surprise %" is a weighted average based on fiscal quarter actual results vs. estimated results. The date used for estimates is 30 calendar days prior to each company's report date. The earnings results of REITs are based on Funds from Operations (FFO).

Figure: 1Q20 Y/Y Earnings Growth

Bottom-up based on constituents

Sector name	1Q20 Y/Y Earnings growth		
	Actual (cos that reported)	Estimates (cos yet to report)	Blend of actuals & estimates
S&P 500 (absolute)	-22.2%	-9.2%	-13.4%
Cyclicals	-8.5%	-11.8%	-11.2%
Near-Cyclicals	-47.3%	-16.0%	-33.6%
Defensives	6.0%	0.8%	2.5%
Technology	5.1%	1.7%	2.4%
Consumer Discretionary	-47.1%	-29.9%	-32.3%
Industrials	-19.4%	-35.2%	-30.7%
Basic Materials	15.8%	-30.6%	-28.5%
Communication Services	2.0%	3.4%	3.2%
Financials	-49.2%	1.9%	-33.4%
Real Estate	6.7%	4.0%	4.3%
Energy	-14.5%	-69.2%	-62.5%
Healthcare	4.8%	1.3%	2.4%
Consumer Staples	7.4%	-1.5%	2.5%
Utilities	7.7%	2.2%	2.9%

Source: Fundstrat, FactSet, Bloomberg.

Note: To adjust for fiscal quarter-end differences, the Y/Y growth calculation is based on calendarized Net Income. Y/Y growth is weighted based on Net Income. The Y/Y growth of REIT earnings is based on Funds from Operations (FFO).

Source: Fundstrat

Sales similarly are weak but not as bad as expected. It looks like overall topline is +1.3% (right side) and with Defensives reporting +4.8% topline growth. So the 1 month negative effects of the global shutdown still did not destroy 1Q2020 results.

#2: S&P 500 Sales Analysis

Blended Y/Y growth includes actuals for companies that have reported, and estimates for companies that have yet to report.

Figure: S&P 500 1Q20 Reported Sales
Bottom-up based on constituents

Sector name	# cos reported	% cos reported	1Q20 Sales results relative to consensus (bottom up)		Surprise (%)	Relative return since 3/31/20
			% cos beating	% cos missing		
S&P 500 (absolute)	120 / 500	24%	48%	52%	-1.0%	8.2%
Cyclicals	51 / 255	20%	49%	51%	-2.4%	0.4%
Near-Cyclicals	44 / 124	35%	48%	50%	-1.4%	-2.3%
Defensives	25 / 121	21%	44%	56%	0.8%	0.7%
Technology	14 / 71	20%	71%	29%	1.4%	-0.3%
Consumer Discretionary	13 / 62	21%	38%	62%	-2.1%	6.4%
Industrials	20 / 72	28%	40%	60%	-5.0%	-4.8%
Basic Materials	1 / 28	4%	100%	0%	0.5%	0.7%
Communication Services	3 / 22	14%	33%	67%	-3.6%	0.1%
Financials	36 / 66	55%	56%	44%	-1.0%	-5.4%
Real Estate	3 / 31	10%	33%	33%	-0.1%	-2.1%
Energy	5 / 27	19%	0%	100%	-4.9%	9.9%
Healthcare	11 / 60	18%	36%	64%	-0.0%	3.3%
Consumer Staples	12 / 33	36%	58%	42%	2.0%	-2.0%
Utilities	2 / 28	7%	0%	100%	-5.5%	-3.8%

Source: Fundstrat, FactSet, Bloomberg.
Note: "Surprise %" is a weighted average based on fiscal quarter actual results vs. estimated results. The date used for estimates is 30 calendar days prior to each company's report date.

Figure: 1Q20 Y/Y Sales Growth
Bottom-up based on constituents

Sector name	1Q20 Y/Y Sales growth		
	Actual (cos that reported)	Estimates (cos yet to report)	Blend of actuals & estimates
S&P 500 (absolute)	1.3%	-0.4%	-0.0%
Cyclicals	-1.5%	-2.3%	-2.2%
Near-Cyclicals	0.4%	-6.2%	-3.9%
Defensives	4.8%	5.8%	5.5%
Technology	5.0%	2.9%	3.4%
Consumer Discretionary	-9.1%	-1.4%	-2.3%
Industrials	-2.7%	-9.3%	-7.8%
Basic Materials	1.3%	-17.0%	-16.6%
Communication Services	-1.7%	7.7%	5.6%
Financials	1.1%	2.8%	1.9%
Real Estate	10.4%	2.0%	2.6%
Energy	-5.6%	-14.4%	-13.5%
Healthcare	5.4%	7.8%	7.2%
Consumer Staples	4.2%	3.5%	3.7%
Utilities	3.3%	3.1%	3.1%

Source: Fundstrat, FactSet, Bloomberg.
Note: to adjust for fiscal quarter-end differences, the Y/Y growth calculation is based on calendarized Sales. Y/Y growth is weighted based on Sales.

Source: Fundstrat

STRATEGY: High-yield performed pretty well last week, despite the Oil Armageddon = supportive for equities.

20% of the high-yield market is Energy and the collapse of WTI oil futures last week was a massive negative development for the high-yield market. Yet high-yield, while off 28bp (yield was +0.33% higher), seems like it was only "nicked" by the WTI collapse.

In fact, the HY primary market was able to price 24 deals totaling \$20.6 billion. According to JPMorgan's HY research team, that is the second highest weekly total of all time. Think about that.

If the global economy was heading into a sustained Depression, we would not expect the HY market to be able to issue the second highest level of issuance in its history.

I would take this as another data point that the market is telling us something positive. Conversely, from an equity perspective, we think that the market has shifted into the hands of buyers, and thus, stocks will likely surprise to the upside in coming weeks.

Disclosures

This research is for the clients of FS Insight only. For additional information, please contact your sales representative or FS Insight at <http://www.fsinsight.com/>.

Conflicts of Interest

This research contains the views, opinions and recommendations of FS Insight. At the time of publication of this report, FS Insight does not know of, or have reason to know of any material conflicts of interest.

General Disclosures

FS Insight is an independent research company and is not a registered investment advisor and is not acting as a broker dealer under any federal or state securities laws.

FS Insight is a member of IRC Securities' Research Prime Services Platform. IRC Securities is a FINRA registered broker-dealer that is focused on supporting the independent research industry. Certain personnel of FS Insight (i.e. Research Analysts) are registered representatives of IRC Securities, a FINRA member firm registered as a broker-dealer with the Securities and Exchange Commission and certain state securities regulators. As registered representatives and independent contractors of IRC Securities, such personnel may receive commissions paid to or shared with IRC Securities for transactions placed by FS Insight clients directly with IRC Securities or with securities firms that may share commissions with IRC Securities in accordance with applicable SEC and FINRA requirements. IRC Securities does not distribute the research of FS Insight, which is available to select institutional clients that have engaged FS Insight.

As registered representatives of IRC Securities our analysts must follow IRC Securities' Written Supervisory Procedures. Notable compliance policies include (1) prohibition of insider trading or the facilitation thereof, (2) maintaining client confidentiality, (3) archival of electronic communications, and (4) appropriate use of electronic communications, amongst other compliance related policies.

FS Insight does not have the same conflicts that traditional sell-side research organizations have because FS Insight (1) does not conduct any investment banking activities, (2) does not manage any investment funds, and (3) our clients are only institutional investors.

This research is for the clients of FS Insight only. Additional information is available upon request. Information has been obtained from sources believed to be reliable, but FS Insight does not warrant its completeness or accuracy except with respect to any disclosures relative to FS Insight and the analyst's involvement (if any) with any of the subject companies of the research. All pricing is as of the market close for the securities discussed, unless otherwise stated. Opinions and estimates constitute our judgment as of the date of this material and are subject to change without notice. Past performance is not indicative of future results. This material is not intended as an offer or solicitation for the purchase or sale of any financial instrument. The opinions and recommendations herein do not take into account individual client circumstances, risk tolerance, objectives, or needs and are not intended as recommendations of particular securities, financial instruments or strategies. The recipient of this report must make its own independent decision regarding any securities or financial instruments mentioned herein. Except in circumstances where FS Insight expressly agrees otherwise in writing, FS Insight is not acting as a municipal advisor and the opinions or views contained herein are not intended to be, and do not constitute, advice, including within the meaning of Section 15B of the Securities Exchange Act of 1934. All research reports are disseminated and available to all clients simultaneously through electronic publication to our internal client **website, fsinsight.com**. Not all research content is redistributed to our clients or made available to third-party aggregators or the media. Please **contact your sales representative** if you would like to receive any of our research publications.

The Yellow Thunderlight over the "BLAST" logo is designed by rawpixel.com / cited from Freepik.

Copyright 2020 FS Insight LLC. All rights reserved. No part of this material may be reprinted, sold or redistributed without the prior written consent of FS Insight LLC.