

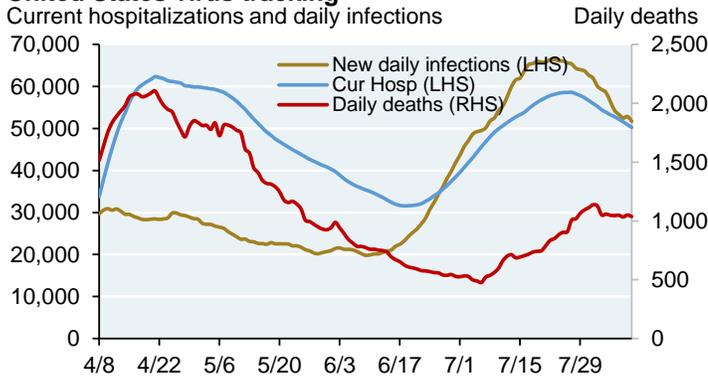


**Charts of the Week: Virus mobility across US state lines; E-commerce trends may defy futurists; Tech stocks and US equity outperformance; Minnows, whales and Goldman’s vaccine report**

**The virus, hospitalization and infection leading indicators**

As we have noted in recent weeks, US infections and hospitalizations have rolled over, which should lead to a rollover in mortality within the next few weeks if prior trends are repeated. To be clear, US virus levels are still high within a global context; only a handful of Latin American countries have higher infection rates than the US.

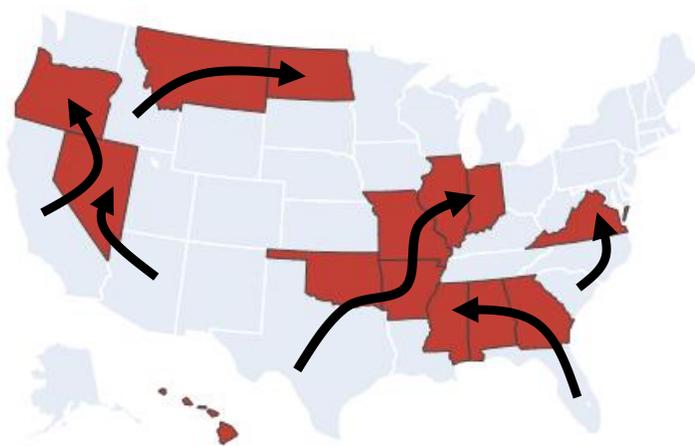
**United States virus tracking**



Source: COVID Tracking Project, JPMAM. 08/10/2020. 7 day avgs.

Why aren’t US infections declining more rapidly? After all, there have been large declines in former Hotspots like California, Texas, Florida and the Carolinas. However, **the US does not have internal border controls; as a result, the obsession with reporting infections at the state level ignores the ease with which US citizens cross state lines.** As shown in the map below, former Hotspot states have now transmitted the infection to new (often less dense) Hotspot states.

**Without border controls, Hotspots keep shifting (red states indicate current Hotspots)**

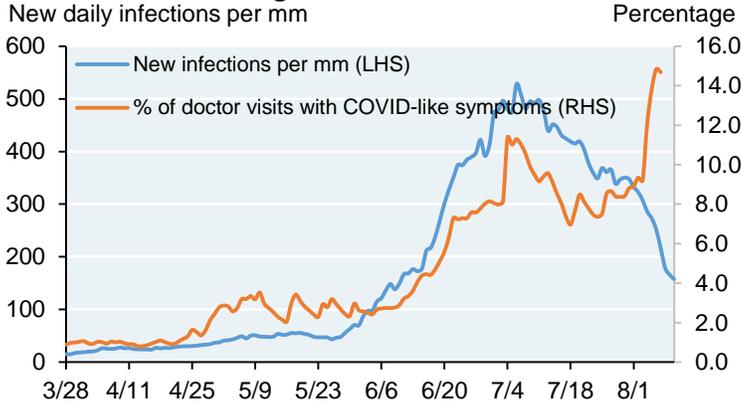


Source: JHU, JPMAM, August 2020



A few weeks ago, we began looking at “doctor visits with COVID-like symptoms” (collated by Carnegie Mellon) as a potential leading indicator of infection. There has been a spike in such symptoms in Arizona at the same time that current infections are plummeting. We will know in a couple of weeks whether this leading indicator is worth tracking or not.

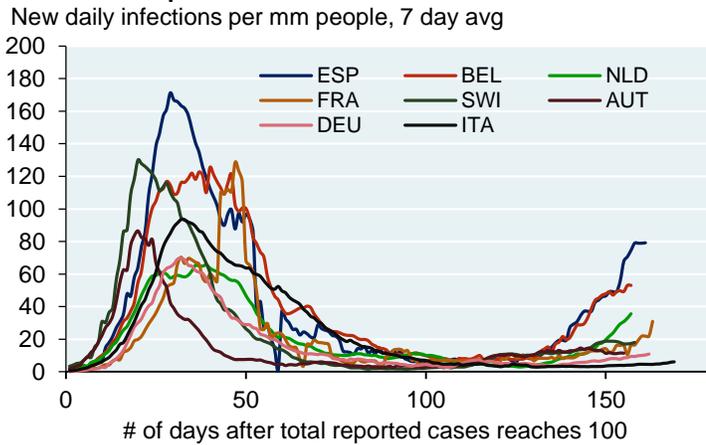
**Arizona virus tracking**



Source: COVID Tracking, JPMAM, Carnegie Mellon University. 08/10/2020.

We’re also keeping a close eye on Europe, whose infections are rising as schools, restaurants, shops, transit stations and other public spaces reopen. Mobility data currently show 15%-25% declines in continental Europe (vs a January baseline) compared to 50%-80% declines in April and May. Interestingly, Italy has had the smallest second wave so far of countries shown below:

**Western Europe infections**



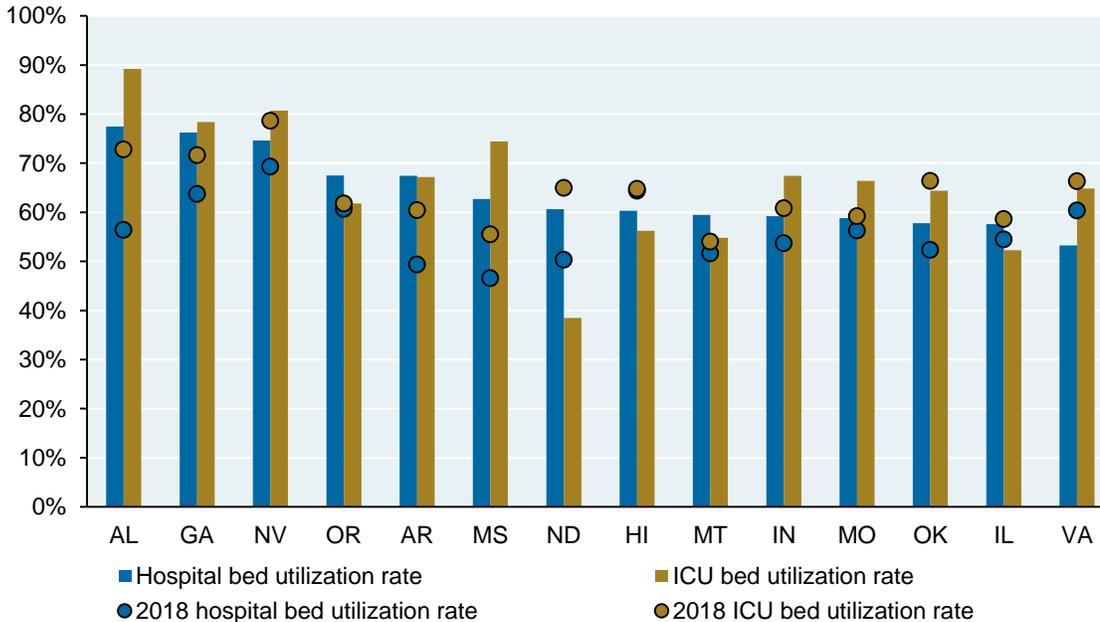
Source: Johns Hopkins University, IMF, JPMAM. August 10, 2020



The US Health and Human Services Department now releases hospital bed and ICU bed utilization rates by state. Some levels are high, although for context, it’s important to understand that most hospital systems are built for 60%-70% utilization in normal periods (shown below as circles using 2018 values as a proxy). Arkansas, Alabama and Mississippi are examples of states with utilization rates well above normal levels.

### Hotspot state hospital bed and ICU bed utilization rates

Sorted by hospital bed utilization rate



Source: HHS, UNC, JPMAM. August 06, 2020.

### The evolution of E-commerce

I see reports from futurists and other forecasters on the coming mega-shift in spending patterns from in-store consumption to e-commerce. As you might expect, e-commerce shares spiked in April as the US experienced its first infection wave. But look at how quickly e-commerce shares have been coming down, and US infections are still only 20% below peak levels. **When US infection levels eventually decline, it’s quite possible that e-commerce shares of spending will be much closer to 2019 levels than to April 2020 peaks.**

#### Evolution of e-commerce shares during the COVID pandemic

	2019 average	April 2020 average	July/August 2020 average
Retail	43%	70%	56%
Healthcare/Pharmacy	27%	45%	32%
Supermarket	4%	11%	11%
Wholesale/Discount clubs	10%	28%	21%
Restaurant	8%	39%	25%

Source: Internal Chase data, JPMAM. Aug 03, 2020.



## US equity outperformance, earnings and tech stocks

I would not blame someone for thinking that US and Emerging Markets equities would be underperforming Europe and Japan this year; after all, the US and EM have been longer-lasting virus epicenters. Nevertheless, an overweight to US and EM equities continues to add value when measured on an index basis in portfolios. This has occurred despite declines in the US\$ vs the Yen and Euro.

### YTD United States/Emerging Markets vs Europe/Japan regional equity market barbell performance

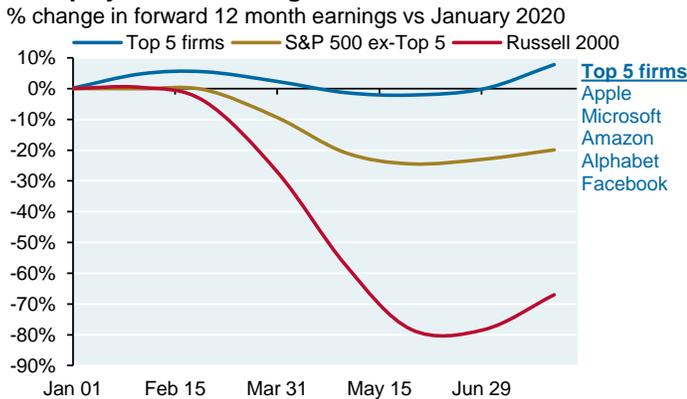
YTD barbell outperformance		Region	Weight	Delta	Rev weight	US\$ return	LOC return
US\$ barbell	1.5%	US	62%	10%	72%	5.1%	5.1%
Local currency barbell	2.2%	EM	12%	5%	17%	-0.5%	3.8%
		EUR	18%	-10%	8%	-7.7%	-10.7%
		JPN	8%	-5%	3%	-5.5%	-8.0%

Source: Bloomberg. August 10, 2020. LOC refers to local currency return.

US equity outperformance is in part due to the earnings resilience of US megacap tech and internet stocks. As shown below, forward looking earnings expectations for these companies hasn't really changed much since January, in contrast to the rest of the S&P 500, and in VERY sharp contrast to the earnings collapse of small cap Russell 2000 companies. The large US weight to megacap tech/internet stocks is starkly different than Europe and Japan, whose equity markets are more driven by energy, materials and industrial stocks.

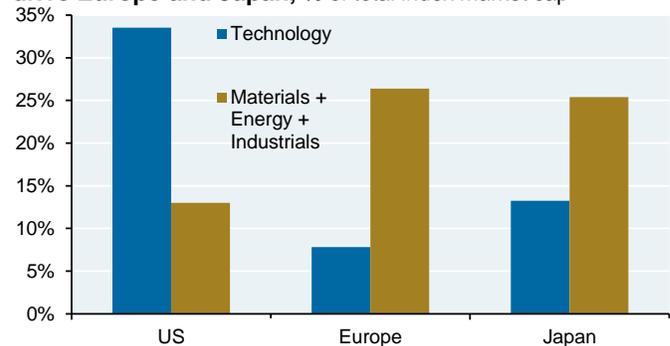
Europe is trying to extract value from US tech companies via the tortured logic of "user-created value" (digital) taxes, which are nothing more than de facto tariffs on US service sector exports. Europe's digital service tax appears to be a subconscious admission that the region will never have megacap tech/internet stocks of its own. And then there's Wirecard AG...

### US equity market earnings



Source: Factset, JPMAM. July 2020

### High growth tech drives US markets, growth laggards drive Europe and Japan, % of total index market cap



Source: Bloomberg. August 10, 2020. Technology includes: GICS level 1 Information Technology + GICS level 3 Interactive Media & Services.



## COVID news of the week: Goldman’s bullish vaccine forecast report

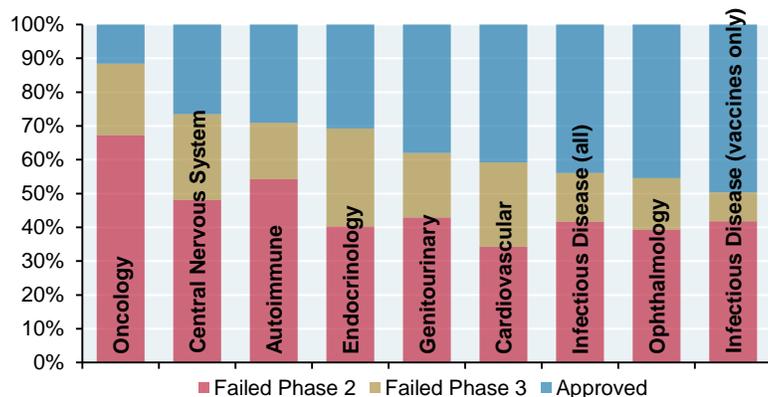
Last week, Goldman issued a report that was bullish on the prospect of vaccine approval in 2020: “We expect that the FDA will approve at least one vaccine this year and that large shares of the US and European populations will be vaccinated by the end of 2021Q2 and 2021Q3, respectively.” I don’t disagree from a completely birds-eye perspective...but based on what?

Goldman’s first exhibit cited a random group of unnamed superforecasters from the “Good Judgment” project, a group of people who make predictions about markets, sports, finance, politics etc. A Maryland pharmacist who emerged as a certified Good Judgment superforecaster explained her process as follows: “I do Google searches”. So I am going to ignore that part.

Another chart showed the number of approved vaccines as a byproduct of vaccine attempts, with the implication that since 115 vaccines are being attempted for COVID, 43 could succeed. This chart was problematic: there’s no epidemiological basis for assuming the existence of a “Grand Unified Vaccine Success Rate theory” (i.e., that more attempts linearly lead to more success). The chart’s own data makes this clear: HIV, Hepatitis C and a number of other diseases had ZERO vaccine approvals, while Hepatitis B and Rotavirus had vaccine success-to-attempt rates  $\geq 50\%$ . The error term of Goldman’s linear estimation of COVID vaccines is so large that the results are probably meaningless. It’s like watching a bunch of minnows and two whales swim by and using their respective masses to linearly estimate the size of the next fish. Some diseases in the dataset also involved less than 10 vaccine attempts, whose success percentages are inherently unstable compared to 50+ attempts for other diseases mentioned above.

Vaccine development is a non-linear thing: some diseases are conducive to vaccine discovery and some are not, and maybe we should leave it there and analyze Phase II/III results as they are reported. Goldman does acknowledge that most COVID vaccine candidates target the same Coronavirus spike protein, which increases the risk of collective success or failure. If you insist on some history on vaccine approvals, here’s some: of all drugs that passed Phase I safety trials and proceeded to Phase II/III, infectious disease vaccines had higher approval rates than other medical conditions (see last bar in chart). That’s as far as I would go, and again, this combines infectious diseases with highly divergent vaccine susceptibility.

**Clinical trial outcomes for drug treatments entering Phase II**



Source: “Estimation of clinical trial success rates and related parameters”, Chi Heem Wong et al, MIT Computer Science and Artificial Intelligence Lab, 2018.



There's an unprecedented level of international cooperation and funding going on, all of which is good news. But as we have stressed before, many front-running COVID vaccine candidates are reliant on RNA/DNA platforms or on "Trojan Horse" vector vaccine approaches, both of which have never been approved before in developed countries. I'm hopeful that a vaccine will be approved this year with production and distribution to follow early next year, but I think it would be a mistake to describe that as an empirically based forecast; it's more of a feeling based on the immunogenicity (antibody and T-cell) results seen in a handful of Phase I trials compared to convalescent plasma, and the fervent hope that we can all start moving around again.

Type	Method of provoking an antibody response to SARS-CoV-2	Select candidates
1	A live but weakened coronavirus that will infect cells and cause them to make viral proteins	
2	Coronavirus proteins themselves, produced industrially in outside cell cultures, which will be recognized as foreign matter in the blood	GlaxoSmithKline/Sanofi, Novavax
3	A "killed" coronavirus that will get recognized as foreign matter in the blood	Sinovac/Dynavax
4*	A different virus (human or ape adenovirus, measles, etc) that is engineered to include genetic components coding for the SARS-CoV-2 spike proteins, which causes the body to then produce them	CanSino, Oxford, J&J, Merck/Themis
5**	DNA or RNA that will be taken up by cells and will cause them to make coronavirus proteins	Moderna, Inovio, BioNTech/Pfizer

\* No adenoviral vector vaccines have yet demonstrated that they can prevent disease in humans. China has approved an adenoviral vector vaccine for Ebola, but Phase II studies did not prove that it prevents Ebola infection. J&J's adenoviral vector vaccine for Ebola is currently under review in Europe.

\*\* There are no approved DNA or RNA vaccines yet, and neither have ever been tested before COVID in a large scale clinical trial

Source: J.P. Morgan Asset Management. May 2020.



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