

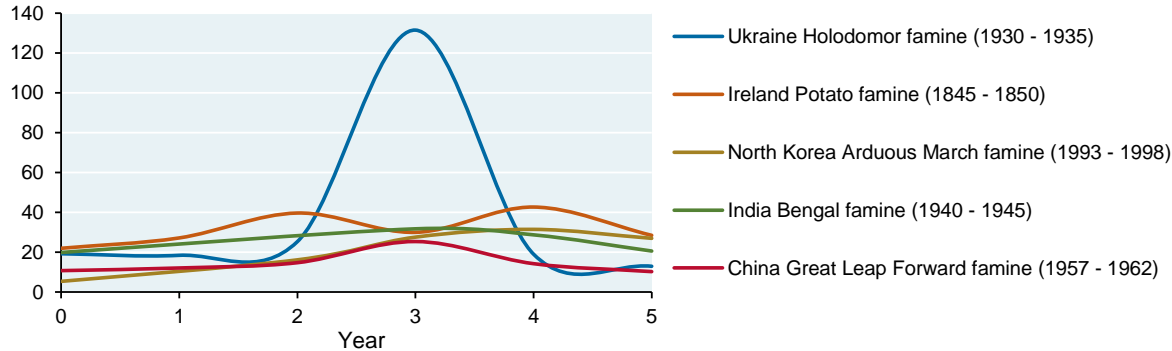


**Surveying the Damage: Russia’s recurring war on Ukraine, equity market declines and the opportunity for bottom-fishing investors, the energy price surge/recession outlook in Europe, the impact of rising metals prices on EV battery costs, the COVID situation in Hong Kong and the latest on ivermectin**

Russia’s invasion of Ukraine is projected to result in one of the largest refugee crises in decades with 4-5 million people displaced<sup>1</sup>; long-lasting water, air and ground pollution in Ukraine; and 90% of Ukraine’s population facing poverty and extreme economic hardship if the war drags on to the end of 2022<sup>2</sup>. For anyone surprised that Russia is imposing this brutal misery on Ukraine, don’t be: there’s ample precedent for it. As shown below, the Holodomor famine imposed by Russia on Ukraine in the 1930’s dwarfs other famines in terms of severity and is another example of Russian subjugation of Ukraine by any means necessary<sup>3</sup>.

**Ukraine Holodomor terror famine compared to other famines**

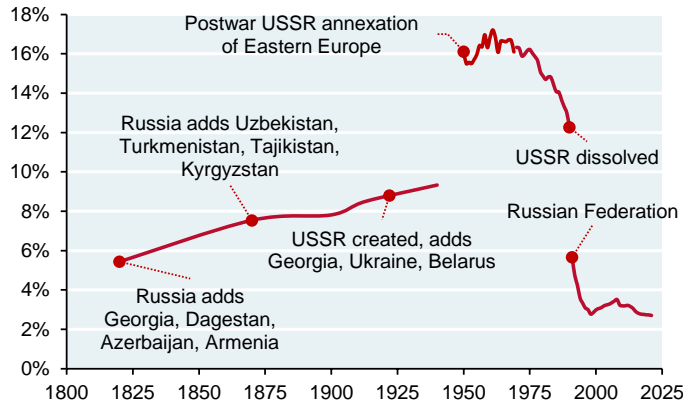
Death rate per 1,000 people



Source: Wolowyna (UNC), Mitchell International Historical Statistics, Maharatna (LSE), Robinson (JHU), Cousens (University of Wales), JPMAM. March 2022.

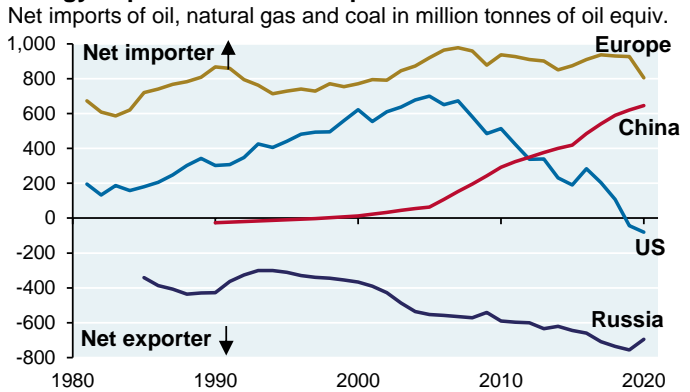
As I wrote in our March 7<sup>th</sup> note, I’m dubious of Europe’s ability to sharply reduce reliance on Russian energy given the need for rapid LNG build-outs, wind/solar/heat pump adoption that’s way above trend, non-existent hydrogen infrastructure and maximizing nuclear. But if Europe pulled it off, Russia’s share of world GDP would shrink further (see chart) at which point it could essentially turn into an energy vassal state for China. China has been Russia’s largest trading partner for over a decade, while Russia accounts for just 2% of Chinese exports.

**Russia/USSR share of World GDP since 1820**



Sources: Angus Maddison database, Conference Board, JPMAM. 2021.

**Energy dependence and independence**



Source: BP Statistical Review, NBS China, JPMAM. 2020.

<sup>1</sup> The 4-5 million figure for Ukraine refugees compares to the following from the UN High Commissioner for Refugees: Syria 6.7 mm, Venezuela 4.0 mm, Afghanistan 2.6 mm, South Sudan 2.2 mm and Myanmar 1.1 mm

<sup>2</sup> UN Development Program press release, March 16, 2022

<sup>3</sup> See “Mass Repression and Political Loyalty: Evidence from Stalin’s Terror by Hunger”, Rosenas (NYU) and Zhukov (University of Michigan), 2019 and Anne Applebaum’s “Red Famine” (2017)

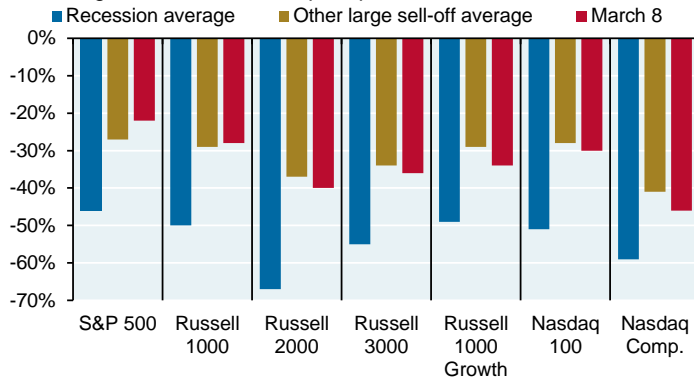


**How bad is the selloff? Tracking opportunities for bottom fishing investors**

The first chart sends a consistent message on US equities<sup>4</sup>: a large correction took place, and if there is no US recession, the March 8<sup>th</sup> low was probably a market bottom as it is similar in magnitude to other large selloffs. If there is a US recession, the average stock decline from peak levels suggests further downside. I consider recession risk to be a close call given rising energy prices, rising credit spreads, rising wages, supply shortages that are now exacerbated by the war and a rapid about-face from the Fed designed to cool things down via higher interest rates (including one or more 50 basis points hikes this year). But I believe the US will make it through without a recession. The second chart is another barometer for bottom-fishing investors: it shows how the average stock sold off much more sharply than its respective index. Since March 8<sup>th</sup>, the US equity indices shown below have risen by 6%-9%.

**March 8 a likely bottom if no US recession occurs**

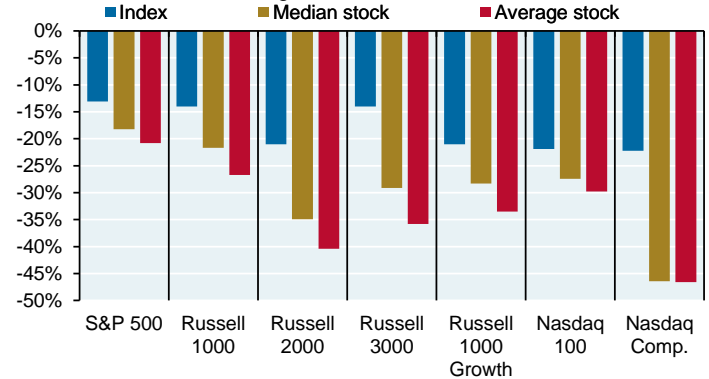
% average stock decline from prior peak



Source: JP Morgan Equity Research. March 17, 2022.

**The average stock fell a lot more than the index it's in**

% decline from 52 week high as of March 8

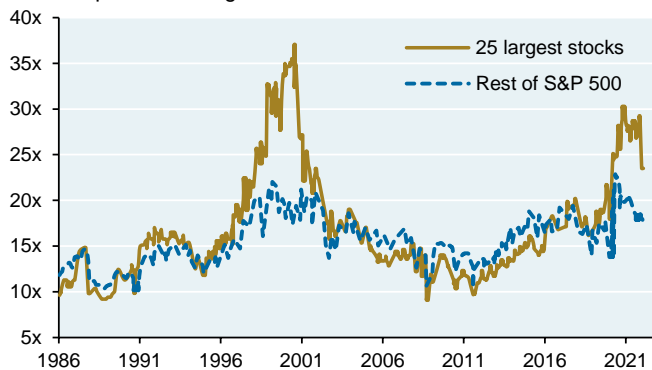


Source: JP Morgan Equity Research. March 17, 2022.

While there has been a lot of damage done to the average stock, the P/E ratio of the 25 stocks with the largest market cap is still elevated compared to history, a reflection of investor confidence in the earnings resilience of these companies<sup>5</sup>. And while hedge fund leverage has come down, it has not collapsed as much as it usually does during recessions. As for institutional long-only asset managers, CFTC futures positions in the S&P 500 and NASDAQ are not quite at 2018 and 2020 lows but are approaching them, while small cap futures positions are now at the lowest levels since the 2008 financial crisis.

**P/E ratio of top 25 stocks vs the market**

Forward price / earnings ratio as of March 16



Source: JP Morgan Equity Research. March 17, 2022.

**Hedge fund gross leverage**

% gross leverage



Source: JP Morgan Economic Research. March 17, 2022.

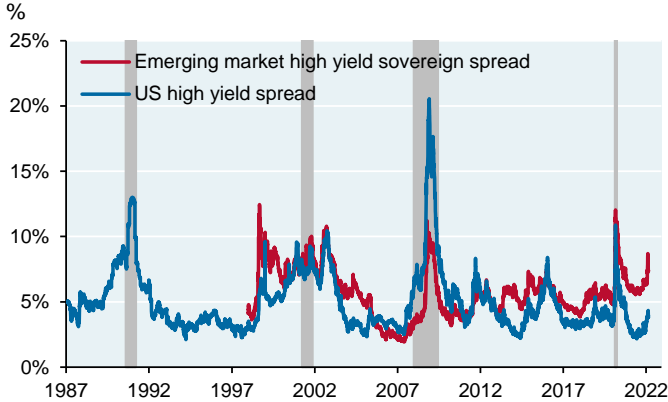
<sup>4</sup> Charts sourced from JP Morgan Global Markets Strategy, March 17 Equity Market Update

<sup>5</sup> The largest 5 stocks are now Apple, Microsoft, Google, Amazon and Tesla. The remainder are comprised of pharma/biotech, mega-banks, specialty retail, interactive media, food/beverage and some energy companies.



**Similar conclusions can be drawn from credit spreads:** while spreads have widened, they are nowhere near levels typically seen during recessions.

**US and emerging market high yield credit spreads**



Source: Bloomberg. March 21, 2022. Shaded areas indicate recessions.

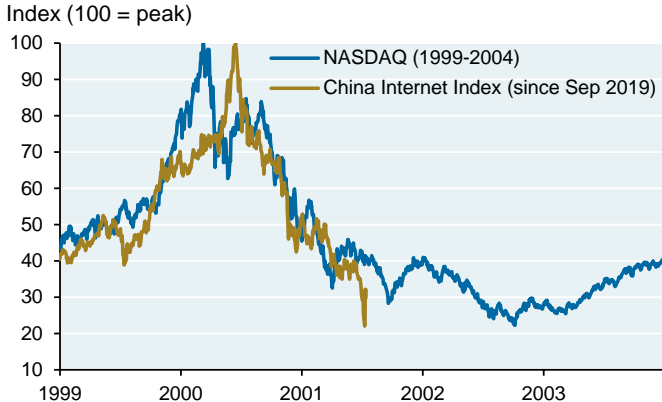
**US investment grade credit spreads**



Source: Bloomberg. March 21, 2022. Shaded areas indicate recessions.

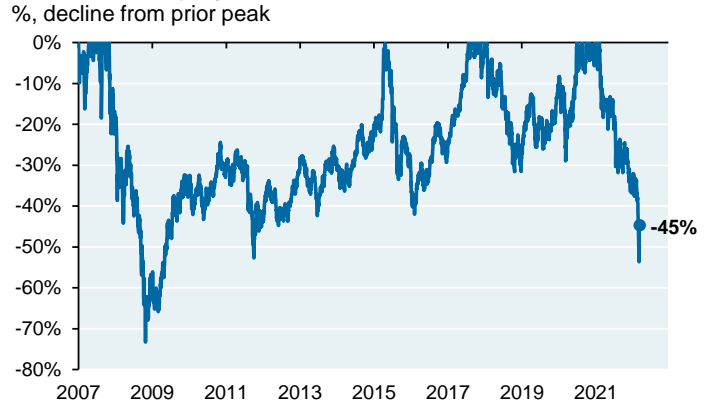
**In contrast, the selloff in China (particularly in the internet sector) is pricing in a lot of adverse news.** Investors should now assume the elimination of all Chinese ADRs and higher costs of capital for Chinese companies, and the lockdowns in Shenzhen and Shanghai are tougher than I expected they would be. However, China has tightened monetary, fiscal and regulatory conditions for the last year and a half, and now has a larger reservoir of stimulus ammunition if they choose to use it. I think they will, since the Communist Party leadership established a 5.5% growth target for this year.

**China internet stocks 2022 vs NASDAQ 2001**



Source: Bloomberg, JPMAM. March 21, 2022.

**MSCI China equity index drawdowns**



Source: Bloomberg, JPMAM. March 21, 2022. Dot represents latest drawdown.



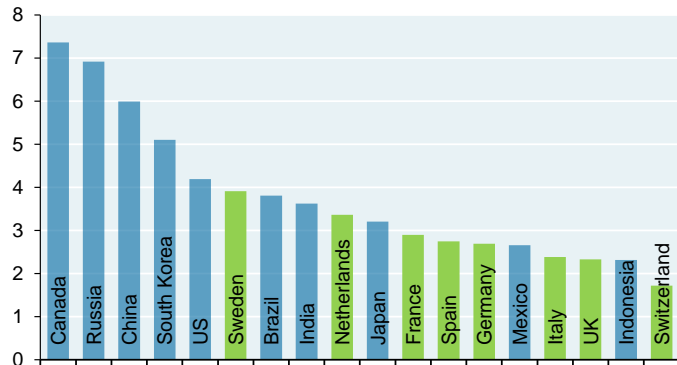
### How bad is the European growth outlook?

Europe is one of the most efficient places on earth regarding energy consumed per unit of GDP (see first chart). Unfortunately, current energy and other producer price increases in Europe are so large as to overwhelm energy efficiency gains. This has been a large commodity shock: a basket of energy, industry and precious metals, agriculture and livestock is up ~80% since the fall of 2019, similar to the commodity price shocks during the 1973/1974 OPEC oil embargo era and the second oil shock in 1979/1980.

As shown below, European electricity and natural gas prices have quadrupled. In addition, Europe is facing a massive producer price shock: the second chart shows the gap between producer and consumer prices. **At some point, the surge in producer prices in Europe either gets absorbed by companies through lower margins, less hiring and less capital spending, or it gets passed on to consumers, triggering higher CPI and tighter policy from central banks.** Since 1948 when the data begins, the US has not experienced anything like the producer price shock that Europe is experiencing now. It looks like a recession in Europe will be the inevitable result. European equities are priced at ~13x with earnings expected to be flat in 2022; during European recessions, earnings can fall 25% with P/E ratios falling below 10x. So, it's hard to argue that Europe is very good value here unless there is an unexpectedly quick end to the Russian invasion of Ukraine.

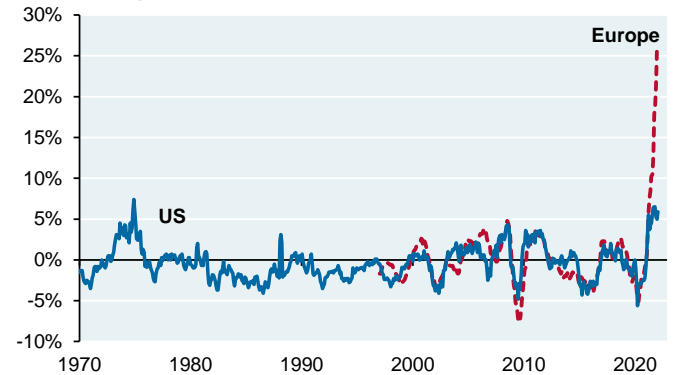
#### Europe: generally lower energy intensity of growth

Exajoules of primary energy consumption per trillion US\$ of real GDP



Source: BP, Conference Board, JPMAM. 2020.

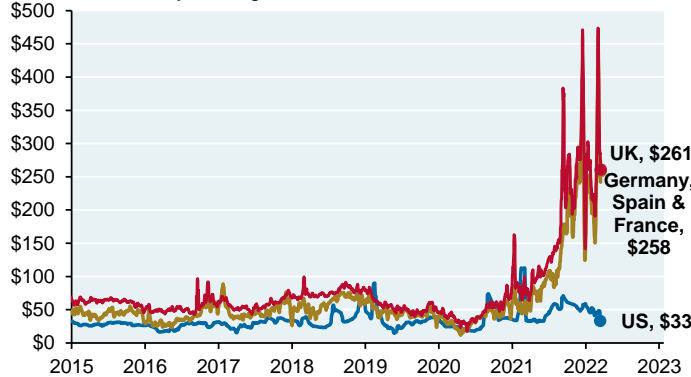
#### Unprecedented surge in European producer prices vs consumer prices, %, producer price less consumer price inflation



Source: Bloomberg, JPMAM. February 2022.

#### Wholesale electricity prices

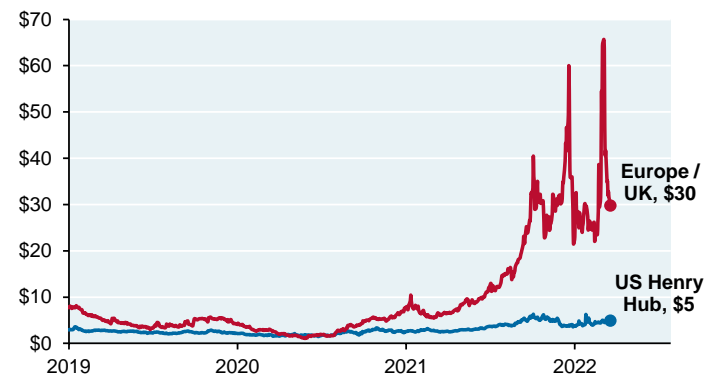
US\$ / MWh, 7 day average



Source: Bloomberg. March 21, 2022.

#### Wholesale natural gas prices

US\$ / MMBTU



Source: Bloomberg. March 21, 2022.



**How bad are rising metals prices for the EV industry?**

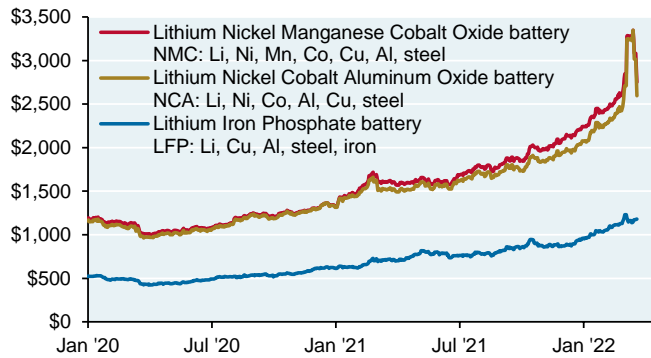
There are wild short squeezes and mayhem reportedly taking place in nickel markets, so current price levels may not last long. But if metals price increases since early 2020 are sustained, what could happen to EV prices due to rising battery costs? Using metals composition of EV batteries from Argonne National Labs and the latest metals prices (including an assumed post-squeeze decline in nickel prices to \$26,500 per metric ton), I took a look. I analyzed a hypothetical 60 kWh battery across three chemistry types: Lithium Nickel Manganese Cobalt (NMC), Lithium Nickel Cobalt Aluminum (NCA) and Lithium Iron Phosphate (LFP). The table shows battery chemistry by auto manufacturer; LFP batteries are used by Tesla and Chinese EV makers, while the rest mostly use NMC at least for now. LFP batteries are typically cheaper but have lower energy densities. China manufactures most LFP batteries while Samsung and LG Chem produce most NMC batteries.

Estimated LFP battery costs have risen by ~\$500 since January 2020, mostly due to rising copper prices; this increase seems manageable as a % of vehicle cost. In contrast, estimated NMC and NCA battery costs increased by ~\$1,500 since January 2020 with a large part of that increase occurring this year due to rising nickel and cobalt prices. For all EVs, there could be another \$500 EV cost increase due to incremental copper and aluminum used for non-battery purposes in excess of amounts needed in internal combustion engine cars.

**The bottom line: there may be some sticker shock for EVs reliant on nickel and cobalt, but not for EVs using LFP chemistry.** Of course, EV owners would save even more on fuel if the gap between gasoline and electricity costs per mile is sustained<sup>6</sup>. I've been a skeptic on US EV adoption rates (just 2% of sales last year), and now there's another headwind that NMC-EVs face that might require even more generous Federal subsidies.

**Metals cost per EV battery**

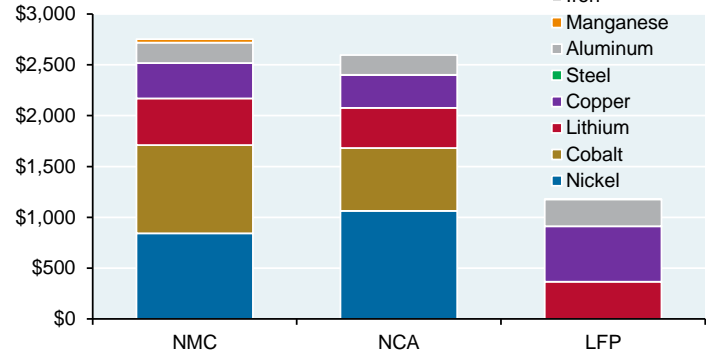
US\$ per 60 kWh battery



Source: University of Birmingham (UK), Argonne National Labs, Bloomberg, JPMAM. March 21, 2022.

**EV battery cost breakdown using current metals prices**

US\$ per 60 kWh battery



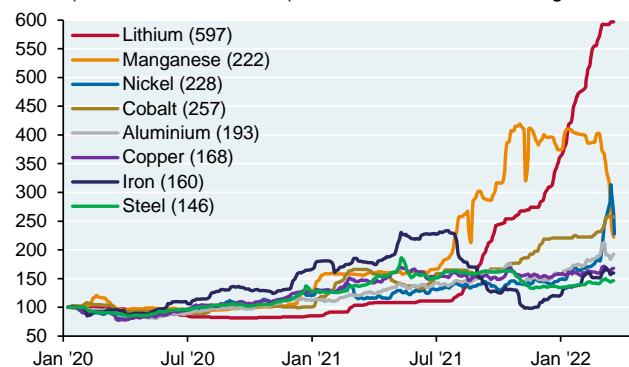
Source: Univ. of Birmingham (UK), Argonne National Lab, Bloomberg, JPMAM. March 21, 2022. Iron and steel values are plotted but are too small to see

Manufacturer	Vehicle type	Battery type
Audi	Passenger EV	NMC
BMW	Passenger EV	NMC
GM	Passenger EV	NMC
Hyundai	Passenger EV	NMC
Kia	Passenger EV	NMC
Mercedes-Benz	Passenger EV	NMC
Porsche	Passenger EV	NMC
BYD (China)	Passenger EV	LFP
Hongguang	Passenger EV	LFP
Ford	F-150 EV	NMC
Tesla	Short range passenger EV	LFP
Tesla	Long range passenger EV	NCA
Volkswagen (2023)	Entry level passenger EV	LFP
Volkswagen (2023)	High end passenger EV	NMC
Rivian	Electric trucks and SUVs	LFP
Rivian	Delivery vans	LFP
Chinese OEMs	Class 8 truck	NMC

Source: S&P Global, Fitch Solutions, EV manufacturers, JPMAM. March 2022.

**Metal prices**

Index (100 = December 2019) with final index values in legend



Source: Bloomberg, JPMAM. March 21, 2022. 3 day smoothing.

<sup>6</sup> Assuming 25 mpg for a gasoline car, 3 miles per kWh for an EV, \$4 gasoline, 14 cents per kWh for electricity and 11,000 miles driven per year, EV owners would save ~\$1,250 per year in fuel expenses. Comparing this annual amount to the incremental upfront cost of an EV over a gasoline car yields the payback period.



## How bad is the COVID situation in Hong Kong? And a comment from Mister Ed on ivermectin

I wrote in February about a research firm I subscribe to whose principal researcher does not believe in the efficacy of COVID vaccines. Their founders are French but their firm is based in Hong Kong given what they often criticize as **creeping French government control of industry** (yes, the ironies are too numerous to mention). In any case, if his vaccine skepticism is influenced by the situation in Hong Kong, he should take a closer look.

Current Hong Kong COVID mortality rates are ~4x peak US levels which took place last year. There are two primary reasons for this, in my view. First, as shown in the table, for some strange reason, vaccination rates in Hong Kong are inverted relative to risk (age). In other words, middle aged people are vaccinated at a much higher rate than older people. Second, around half of the people in Hong Kong are vaccinated with CoronaVac, a vaccine produced by Beijing-based Sinovac. Among those over 80, CoronaVac is only 45% effective against mortality<sup>7</sup>. I don't have a direct comparison for 80+, but the latest mRNA vaccine efficacy metric for the 65+ US population is 70%-80% according to Oakland's Public Health Institute.

China is reportedly working on its own mRNA vaccine which is still in Phase III trials. One such Chinese company was added to the US Federal Trade restricted list given its alleged use of biotechnology to support activities such as "brain control weaponry" (!!). Separately, BioNTech and its Chinese partner have completed their own trials but their mRNA vaccine has not been approved yet by Chinese authorities.

### COVID mortality

Daily deaths, # per mm, smoothing = 7 days



Source: Johns Hopkins University, IMF, JPMAM. Mar 20, 2022.

### Hong Kong vaccination rates by age

Age	% of age group fully vaccinated
3-11	11%
12-19	73%
20-29	85%
30-39	86%
40-49	93%
50-59	89%
60-69	79%
70-79	66%
80+	39%

Source: Government of the Hong Kong Special Administrative Region. March 21, 2022.

### The latest on ivermectin: "Neigh", says Mister Ed

A recent clinical trial in Brazil evaluated the effects of ivermectin when administered to those who tested positive for COVID and were at risk of severe disease. Half of the ~1,400 patients were prescribed ivermectin for three days, and then tracked for 28 days to determine whether they were hospitalized and if they cleared the virus faster than patients who received placebo pills. The trial concluded that **ivermectin did not improve patient outcomes**, either in terms of reduced hospitalizations or increased speed of recovery<sup>8</sup>.

As a reminder: ivermectin is a horse de-worming drug but is also a very effective drug for humans infected with certain parasites (its creators won the Nobel Prize for it in 2015). When used for parasitic treatment, ivermectin is given as a one-time dose; the "ivermectin for COVID" crowd are often taking it twice a week even though there is no safety data on prolonged use.

None of my analysts understood the Mister Ed reference since they did not know who he was. The cultural divide between my generation and theirs is unbridgeable. Maybe it's time for me to be put out to pasture.

<sup>7</sup> "China's COVID vaccines have been crucial – now immunity is waning", Mallapaty (Nature), October 14, 2021

<sup>8</sup> TOGETHER trial, Edward Mills (McMaster University) and Craig Rayner (Monash University), March 2022

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