

Introduction

I drive a minivan. It's a reliable Toyota Sienna. I never thought I'd be a minivan driver. But when you have three young boys and two exhausted (and proud) parents, it's a game changer. I've always liked my van, except for the max 18 mpg it gets. When I went to Sheetz the other day to fill up, I was left with a quandary. At 4.99/gallon, do I put a splash in to tide me over for the next day or two, gambling that prices go down and avoid the \$75 full-tank fill-up? Or do I bite the bullet and pump 15 gallons, gambling the prices will only continue to rise? Doubtless, many of you have faced the same question lately. In what have felt like a relentless onslaught of rising prices at the store and declining prices in the stock market, we've all been plagued with sticker shock in both directions lately. In the following pages, we recap the last six months and share some insights into what the future may hold. We hope you find this informative and entertaining. And as always, we welcome your feedback and suggestions for future updates.

Recap & Outlook

The theme of the first half might aptly be summarized as "What goes up must come down." Coming off wildly bloated markets as of year end 2021, the markets were ripe for some short-term weakness. And boy, did we get it.

	YTD Return ⁸	1 Yr Avg Return ⁸	3-Yr Avg Return ⁸	5-Yr Avg Return ⁸	10-Yr Avg Return ⁸
US Large Companies (Broad) ¹	-19.96%	-10.62%	10.59%	11.30%	12.95%
US Large Companies (Tech) ²	-29.22%	-20.38%	15.41%	16.36%	17.26%
US Mid-Size Companies ³	-19.54%	-14.64%	10.59%	7.02%	10.89%
US Small Companies ⁴	-23.43%	-25.20%	4.21%	5.16%	9.35%
International Companies ⁵	-19.25%	-17.33%	1.54%	2.69%	5.88%
Bonds ⁶	-10.35%	-10.29%	-0.93%	0.88%	1.54%
Commodities ⁷	18.44%	24.27%	14.33%	8.39%	-0.82%

¹ Return based on S&P 500 total return index per Morningstar.

² Return based on Nasdaq 100 total return index per Morningstar.

³ Return based on S&P 400 total return index per Morningstar.

⁴ Return based on Russell 2000 total return index per Morningstar.

⁵ Return based on MSCI EAFE gross return index per Morningstar.

⁶ Return based on Bloomberg Barclays US Aggregate Bond total return index per Morningstar.

⁷ Return based on Bloomberg Commodity total return index per Morningstar.

⁸ Returns are given in annualized percentages.

All the major averages, save for commodities, were down double digits in the first half. Even bonds, the historical hiding spot during times of stress, suffered through a rough six months. Rising inflation was the krypton to bonds' strength; more on inflation and interest rates later.

In times like these, it can be difficult to "see the forest through the trees." But some perspective is precisely what we need most right now.

Courtesy of the wonderful research outfit [Bespoke Investment Group](#), there's some positive news to share about prolonged negative returns. Prior to Q2 2022, there were eight prior instances when the stock market dropped 15% or more in a single quarter. In all eight cases, the stock market was positive over the next year (**Figure 1**).

Figure 1: 15%+ Quarterly Drops

15%+ Quarterly Drops for the S&P 500: Post WW2				
Quarter	Quarterly Drop (%)	Next Quarter (%)	Next Half (%)	Next Year (%)
Sep-46	-18.83	2.27	1.40	1.00
Jun-62	-21.28	2.78	15.25	26.70
Jun-70	-18.87	15.80	26.72	37.10
Sep-74	-26.12	7.90	31.19	32.00
Dec-87	-23.23	4.78	10.69	12.40
Sep-02	-17.63	7.92	4.04	22.16
Dec-08	-22.56	-11.67	1.78	23.45
Mar-20	-20.00	19.95	30.12	53.71
Jun-22	-16.45	?	?	?
	Average	6.22	15.15	26.07
	Median	6.34	12.97	25.08

Similarly, prior to the first half of 2022, there were eight prior instances of two consecutive quarters over which the stock market dropped 20% or more. Once again, in all eight cases, the stock market was positive over the next year (**Figure 2**).

Figure 2: 20+ Two Quarter Drops

20%+ Two Quarter Drops for the S&P 500: Post WW2				
Quarter	2-Qtr Drop (%)	Next Quarter (%)	Next Half (%)	Next Year (%)
Jun-62	-23.48	2.78	15.25	26.70
Jun-70	-21.01	15.80	26.72	37.10
Sep-74	-32.39	7.90	31.19	32.00
Dec-74	-20.28	21.59	38.84	31.55
Sep-02	-28.94	7.92	4.04	22.16
Dec-08	-29.43	-11.67	1.78	23.45
Mar-09	-31.59	15.22	32.49	46.57
Jun-22	-20.58	?	?	?
	Average	8.51	21.47	31.36
	Median	7.92	26.72	31.55

If past is prologue for the future, or even tends to rhyme with it, it is not unreasonable to expect the stock market to pick up steam over the next year.

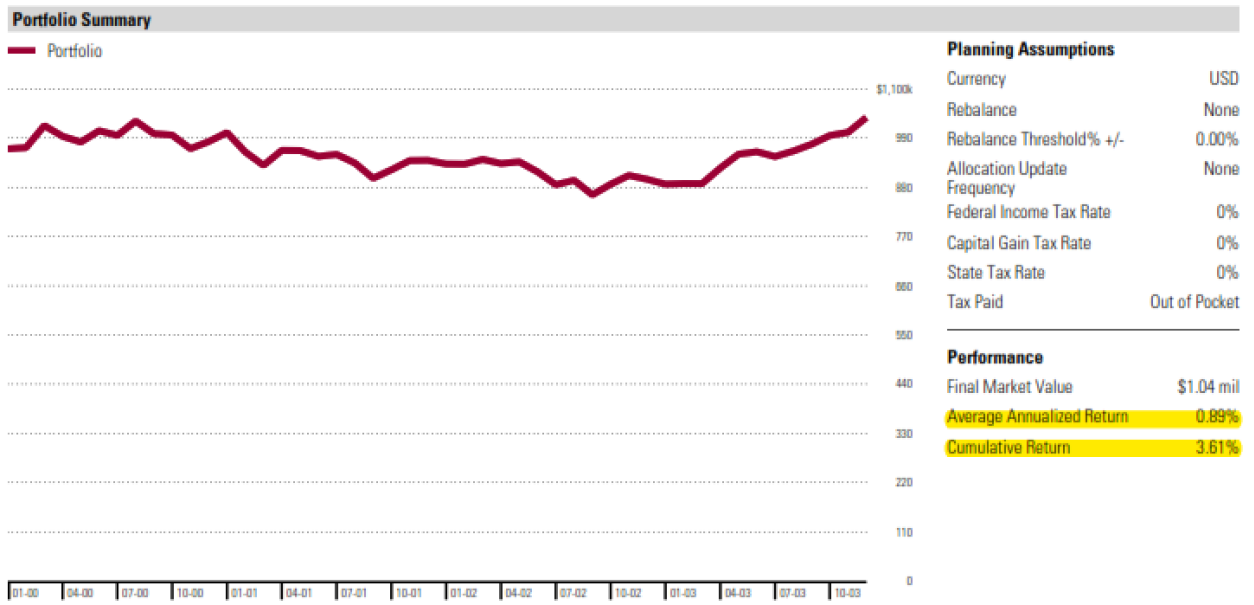
Over the last six months, we have heard one comment and one question time and time again.

- The Comment: I cannot afford to lose money now because I'm near retirement. Or I cannot afford to lose money now because I'm older and this is all I have.
- The Question: Should I get out now?

There is tremendous gravity to these concerns, and we'd like to address them succinctly but sufficiently. Let's tackle The Comment first. *Perception* is that it takes a long time to recover from bad stock markets. The *reality* is that recoveries happen faster than we think they will.

Cases in point: On the next page, we highlight the returns of a diversified portfolio during the Dotcom bust (circa 2000) and the Housing Bubble (circa 2008). In both circumstances, investors were back to break even within four years, if not sooner. Two important caveats: First, it's important to be diversified. We used a 40% US stocks, 20% international stocks, and 40% bond portfolio, or a standard 60/40 portfolio. Diversification limits the upside, but more importantly, it helps reduce the downside. And that's what you care about in bad markets. Second, it's important to periodically review your portfolio and rebalance as necessary. Regularly rebalancing helps sell high and buy low.

Figure 3: Dotcom Performance of Diversified Portfolio



Portfolio-Level Performance Disclosure

The portfolio-level performance shown is hypothetical and for illustrative purposes only. Investor returns will differ from the results shown.

Investment Detail

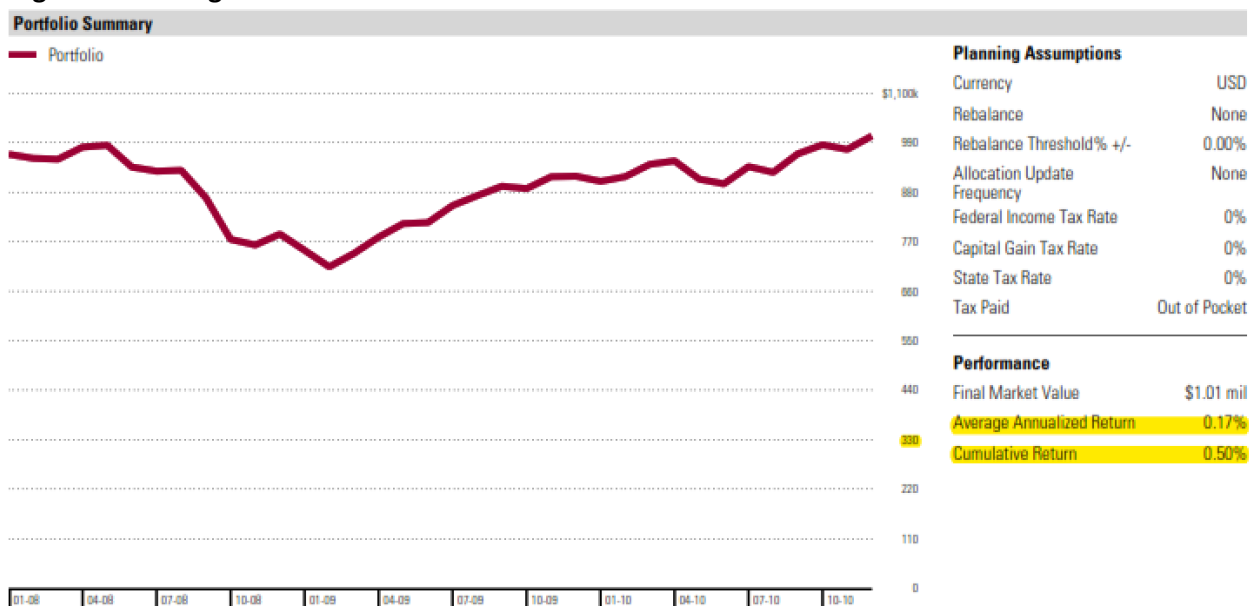
Period	Beginning Balance	New Investment	Distribution/Withdrawal	Total Reinvest	Charges & Fees	Taxes Due	Market Value	Total Return %
Totals	0	1,000,000	0	0	0	0	1,036,077	0.89
January-December 2000	0	1,000,000	0	0	0	0	982,171	-1.78
January-December 2001	982,171	0	0	0	0	0	940,165	-4.28
January-December 2002	940,165	0	0	0	0	0	897,788	-4.51
January-December 2003	897,788	0	0	0	0	0	1,036,077	15.40

Figure 3 shows the impact of investing \$1,000,000 on January 1, 2000 at the height of the Dotcom bubble. Assuming a diversified portfolio and periodic rebalancing, the investor was back to breakeven after four years. The full report can be found [here](#).

Figure 4 shows the impact of investing \$1,000,000 on January 1, 2008 at the height of the Housing Bubble. Using the same assumptions, the investor broke even after just three years. The full report can be found [here](#).

Again, the perceived myth is that it takes many years, maybe even a decade, to get back to breakeven. In historical context, this simply isn't the case.

Figure 4: Housing Bubble Performance of Diversified Portfolio



Portfolio-Level Performance Disclosure

The portfolio-level performance shown is hypothetical and for illustrative purposes only. Investor returns will differ from the results shown.

Investment Detail

Period	Beginning Balance	New Investment	Distribution/Withdrawal	Total Reinvest	Charges & Fees	Taxes Due	Market Value	Total Return %
Totals	0	1,000,000	0	0	0	0	1,005,040	0.17
January-December 2008	0	1,000,000	0	0	0	0	786,853	-21.31
January-December 2009	786,853	0	0	0	0	0	915,478	16.35
January-December 2010	915,478	0	0	0	0	0	1,005,040	9.78

These results are all well and good. But what happens if we factor in withdraws during these periods. After all, if the investor is retired and he or she is withdrawing funds, that will surely have a negative impact on the results, right?

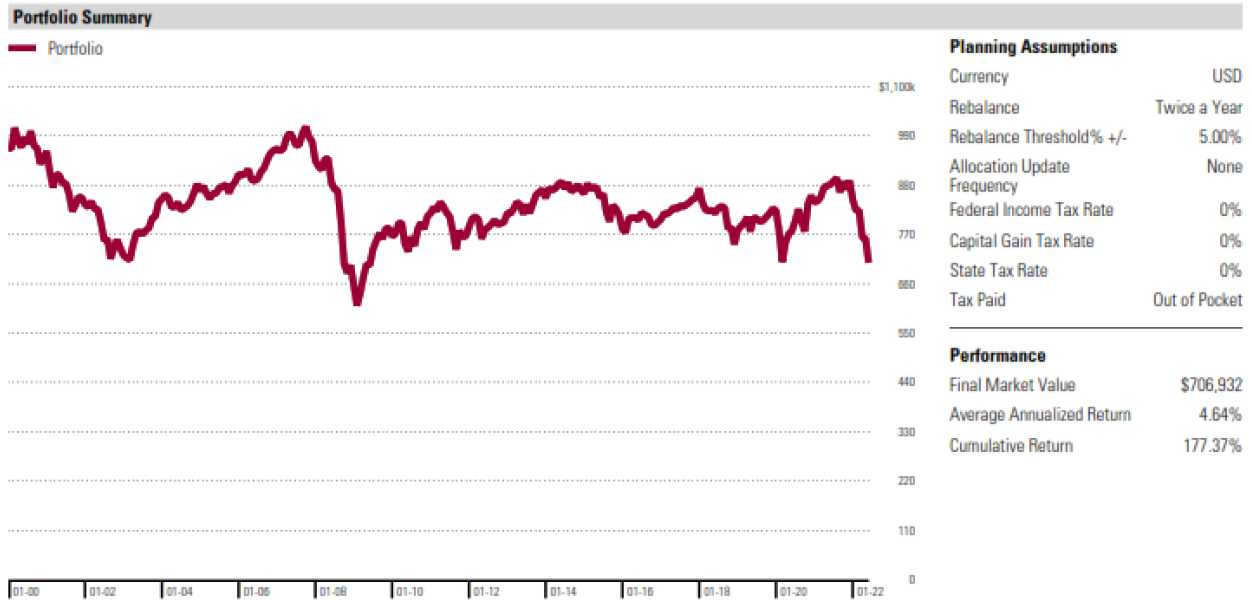
Once again, the results are surprisingly good. Let’s paint a dire scenario: An investor retires on January 1, 2000, at the height of the Dotcom bubble. He has \$1,000,000 to start. He starts taking out 4% of his accounts value each year. Not only that, he bumps that 4% up for inflation each year (**Figure 5**). [NOTE: The \$1,000,000 figure is completely arbitrary. It makes the math easier, but it has no effects on the results. Whether he had \$10,000 or \$100,000 or \$100,000,000, the percentage returns are the same].

Now, this investor arguably couldn’t have picked a worse time to retire! As soon as he retires, the market implodes. It recovers, and then a few years later it implodes again during the Housing Bubble. In 2022, the market begins to decline again. So this investor weathered the two worst market declines since the Great Depression and the decline in 2022 and...

- **He started with \$1,000,000**
- **He ended with \$706,932**
- **Over those 21+ years, he withdrew a total of \$1,259,667!**

If the goal is never to run out of money, than dang, that doesn't look to bad. The full report can be found [here](#).

Figure 5: Retiring at the Worst Possible Time...and Still Being Okay



Portfolio-Level Performance Disclosure

The portfolio-level performance shown is hypothetical and for illustrative purposes only. Investor returns will differ from the results shown.

Investment Detail

Period	Beginning Balance	New Investment	Distribution/Withdrawal	Total Reinvest	Charges & Fees	Taxes Due	Market Value	Total Return %
Totals	0	1,000,000	1,259,667	0	0	0	706,932	4.64

As frustratingly difficult as it is to stay patient in rough times, it is incredibly important. For instance, take a look at this fascinating report by Putnam Investments (**Figure 6**). The full report can be found [here](#).

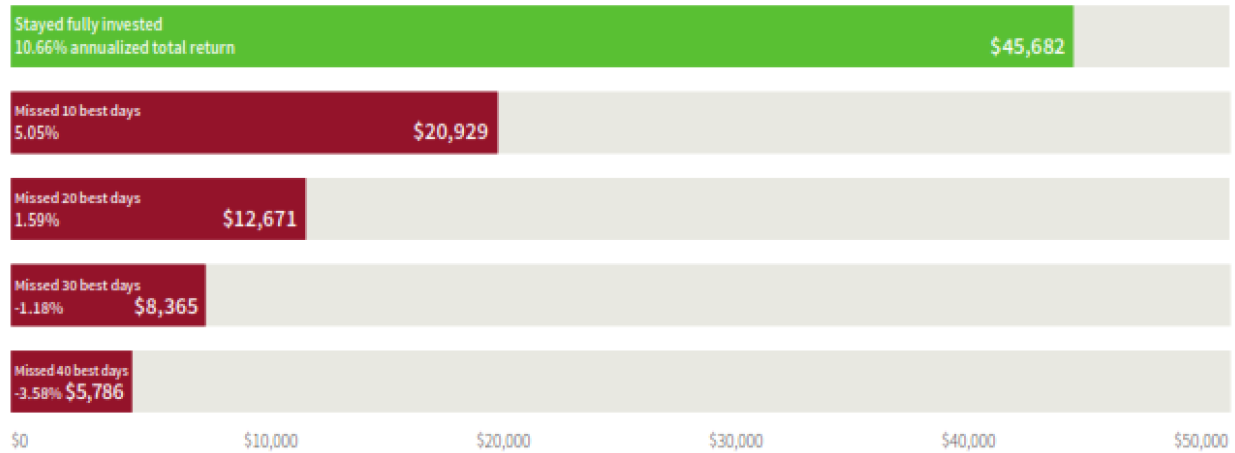
How would you like to earn 356% on your investment? Surely, you'd rather earn that than 109%. If you invested \$10,000 into the S&P 500 on 01/01/2007 and kept it there through 12/31/2021, you would have made 356%, ending with a balance of \$45,682.

But if you missed the 10 best single days during that time, you would have earned 109%, ending with \$20,929. That's massive difference simply for missing a few days!

Why January 1, 2007? Well, that was right before the housing bubble. So you made an investment at the top of the market, you immediately get slammed with a nasty recession, and you still end up with 356% returns.

Figure 6: Staying Invested vs. Missing 10 Best Days

\$10,000 invested in the S&P 500 (12/31/06-12/31/21)



Data is historical. Past performance is not a guarantee of future results. The best time to invest assumes shares are bought when market prices are low.

Here’s where things getting interesting. When did those 10 best days occur? Most of the best days occurred right the middle of very bad markets (**Figure 7**).

- In October 2008, the S&P 500 lost (16.8%)...But, 3 of the 10 best days occurred during this month
- In November 2008, the S&P 500 lost (7.5%)...But, 2 of the 10 best days occurred then
- In March 2020, the S&P 500 lost (13.1%)...But, 2 of the 10 best days happened that month

The moral of the story: Really good days can and do happen during really awful stock markets. You can’t predict those days. You can’t time those days. And if you miss those days, your long-term return is significantly worse than had you stayed invested.

One final thought about market timing. All bear markets have bull traps. Put another way, there are periods during bad markets when stocks rally over the short term (bull traps). Folks who are bulls, or Positive on stocks, get sucked into the market, only to see the market begin to turn lower again (bull trap). Trying to time these bull traps in difficult. **Figure 8** illustrates this idea beautifully.

Figure 7: 10 Best Days from 2007-2021 (Using SPY)

Date	Open	Close	Return
10/13/2008	93.87	101.35	14.52%
10/28/2008	87.34	93.76	11.69%
3/24/2020	234.42	243.15	9.06%
3/13/2020	263.09	269.32	8.55%
3/23/2009	78.74	82.22	7.18%
11/24/2008	81.92	85.03	6.93%
4/6/2020	257.84	264.86	6.72%
11/13/2008	86.13	91.17	6.23%
10/20/2008	95.35	98.81	6.01%
3/10/2009	69.51	72.17	5.96%

Global Financial Crisis (Housing Bust)

October 2008	-16.80%
November 2008	-7.50%

COVID Crash

March 2020	-13.10%
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Figure 8: Past Bull Traps



With history as our guide, there is reason to be optimistic over the long-term. In the more immediate future, what can we expect? For that, let's take a look at a few more charts on the next few pages.

Past bear markets (20%+ drops) share many similar traits. We chose to highlight a few below.

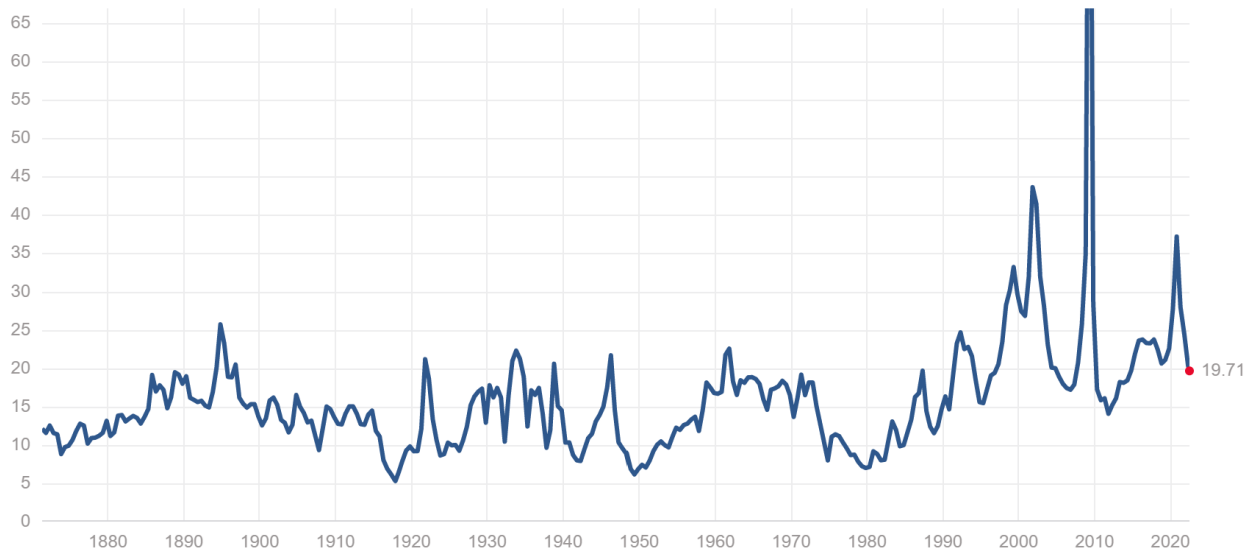
The first chart highlights P/E, or price to earnings, ratios. Brief recap: If a company trades @ \$15/share and it has \$1/share of profit (earnings), it has a P/E = 15 [15/1].

The average P/E for the S&P 500 is 16 over the long run. If the P/E is higher, than mean reversion implies that the P/E must come down to average. That can happen two ways: either price goes down or earnings go up. Well, logically, earnings don't go up when the market goes down. If we're in a recession, companies aren't earning more. Thus, prices must come down. That's exactly what we're seeing now. In June 2022, the P/E was 18, still slightly above long-term averages.

Here's where it gets twisted. The P/E tends to shoot way up right near the end the bear market. Wait, didn't we just say the P/E has to fall? Yep, but once that happens, the earnings start to play tricks. As the recession matures, stock prices fall and the P/E thus falls. Companies begin to feel the pain, and earnings really start to suffer. As earnings fall, the denominator in the P/E becomes smaller and smaller. Basic math: If the denominator is shrinking, the quotient (P/E value) goes up.

Here's the P/E of the S&P 500 over time (**Figure 9**). Notice the sharp spikes in 2002 (Dotcom bottom), 2009 (Housing Bubble bottom), and 2020 (COVID bottom). In all three scenarios, the P/E shot way up very quickly. Companies simply had little to no earnings, and that pushed P/Es up. Data can be found [here](#).

Figure 9: S&P 500 P/E Ratios



In short, look for earnings to fall (and the P/E to spike) before the stock market bottoms.

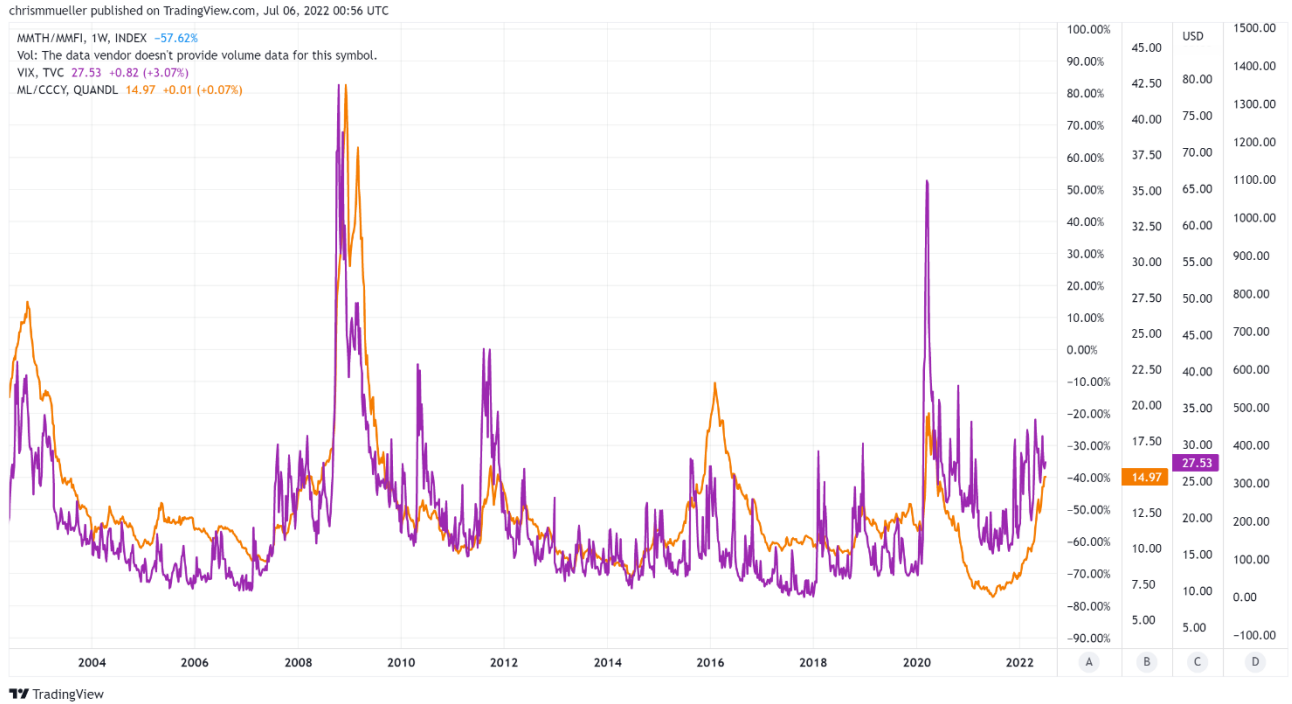
Two other indications of market stress: high yield bond yields and the VIX index. High yield bonds are debt securities issued by risky businesses. A simple thought exercise: Imagine someone with a steady job who makes \$100,000/yr and who is buying a \$250,000 house. This person would get a good interest rate on his mortgage. Now imagine someone who has bounced around to different jobs, who makes \$50,000/yr, and who is buying the same \$250,000 house. This person will get a higher rate because there is more risk lending to him. A high yield bond is like the mortgage issued to the lower income earner.

The VIX is a measure of implied volatility in the stock market. In plain English, the higher the VIX, the bigger the daily moves expected in the S&P 500 index. As a general rule, a high VIX occurs when everyone is afraid of stocks.

Figure 10 shows **high yield bonds (orange)** and **VIX (purple)**. Two observations:

- High yield spikes in times of stress. In Dotcom, Housing Bubble, and COVID, HY values topped 20 each time. Currently the value of 14.97.
- VIX also spikes during market stress. Again observe the massive spikes that occur, particularly during Housing Bubble and COVID. (As an aside, smaller spikes coincide with more routine corrections).

Figure 10: High Yield (CCC) Values and VIX Index



Until the VIX and HY values reach past levels of market stress and until earnings begin to taper, it is likely the stock market will continue to move lower.

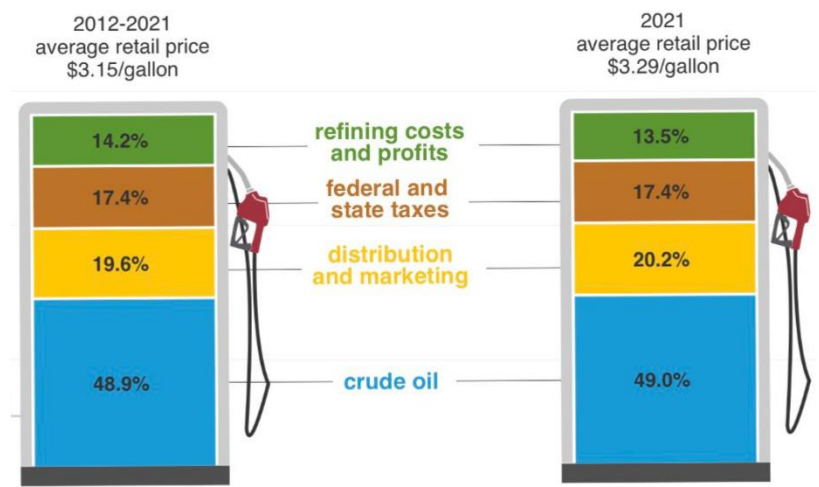
Inflation

We could easily devote 50 pages to inflation, but we wouldn't be telling anything you didn't know already. Instead, we'd like highlight a few keys ideas. Let's start with energy.

Here's a neat graphic on cost inputs on fuel (**Figure 11**). A few thoughts:

- Cutting Fed and state taxes seems like a convenient fix. However, a large portion of these taxes are used for infrastructure projects, like building roads and fixing bridges. We need continued investment in infrastructure to sustain our economic future.
- Companies may have some wiggle room with distribution and marketing expenses, but not much. They have to get gas from oil fields to refineries and refineries to gas stations.

Figure 11: What We Pay for Gallon on Diesel Fuel



Source: U.S. Energy Information Administration, *Gasoline and Diesel Fuel Update*

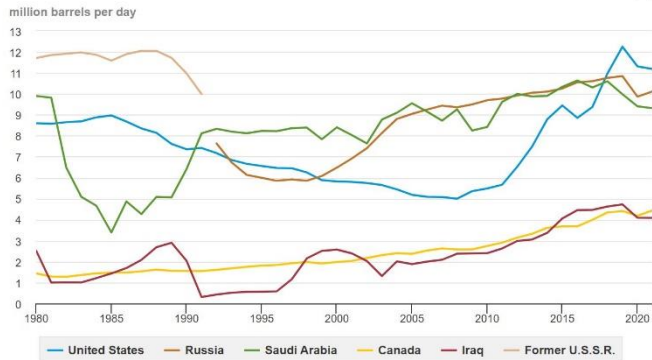
With respect to crude oil and refining capacity, the Ukraine war unequivocally makes a difference. Based on EIA data, Russia is the world's [second largest producer of crude oil](#) (Figure 12) and the [third largest refiner of crude oil](#) (Figure 13).

Figure 12: Oil Production by Country

The top five crude oil producers and their percentage shares of world crude oil production in 2021 were:

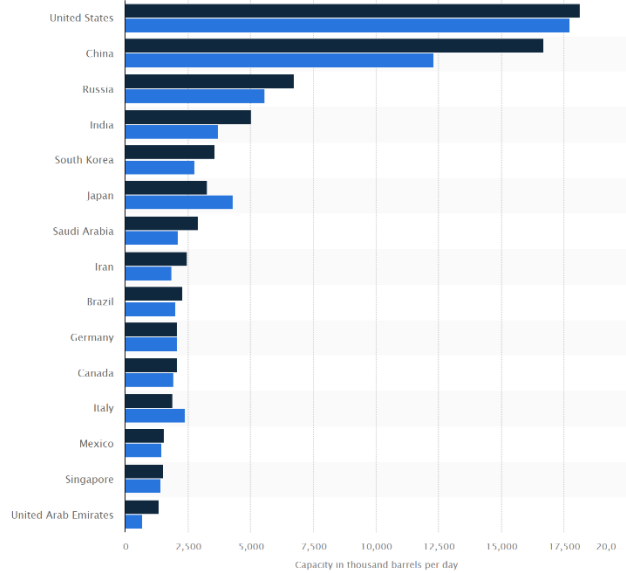


Top five crude oil producing countries, 1980-2021



Data source: U.S. Energy Information Administration, International Energy Statistics, as of June 1, 2022. Note: Includes crude oil and lease condensate. Ranking based on production in 2021.

Figure 13: Refining Capacity by Country



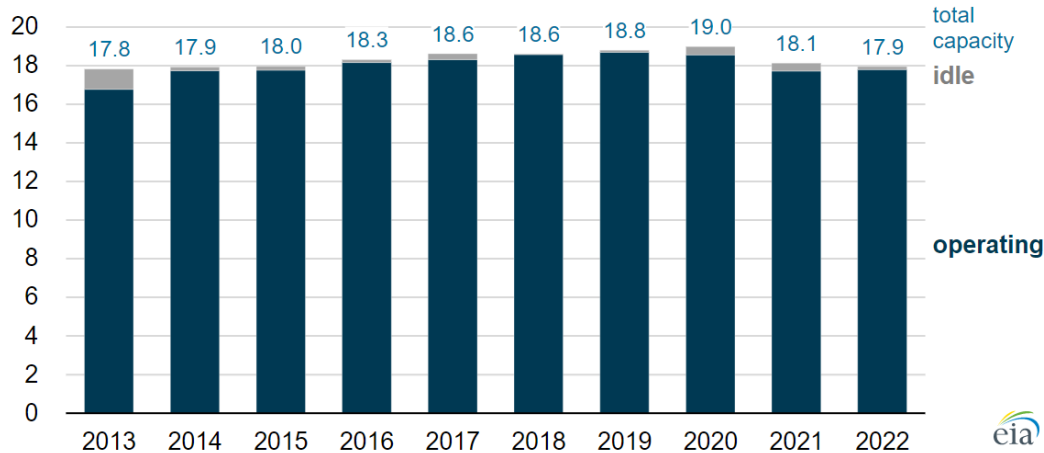
Russia is still producing and refining oil. Western economies are not consuming it. When you remove a massive source of production and refining capacity overnight, the knock-on effects are drastic. Finding alternatives for Russia production and refining will take time.

Closer to home, US refining capacity is running a peak production (Figure 14). According to EIA data, the amount of idle refining capacity is running at historically low rates. In other words, we are refining as much oil as possible. Perhaps the bigger issue is absolute refining capacity. For two consecutive years, refining capacity in the United States has decreased. If supply is reduced and demand stays the same, prices must go up. On top of that, Russian supply is now carved out, further pressuring prices. For those

Figure 14: US Refining Capacity

Annual U.S. refinery atmospheric crude oil distillation capacity (2013–2022)

million barrels per calendar day as of January 1



Data source: U.S. Energy Information Administration, [Refinery Capacity Report](#)



of you on Twitter, there is a good [thread](#) that highlights the refining capacity lost in recent years. The last time the [US built a refinery of significant size was in 1977](#). Building new refineries is, of course, a contentious issue. Even if a new refinery were approved, it would take years before it came online. And given that turnaround, it would have little bearing on easing current prices.

There is some good news. Gasoline futures are starting to fall (**Figure 15**). Prices at the pump closely track gasoline futures, so any decrease in futures prices should translate into cheaper prices when filling up. **Gas futures (blue)** lead actual **gas prices (brown)**.

Figure 15: Gasoline Futures vs. Gasoline Prices



Figure 16: Gasoline, Natural Gas, and Propane Futures



More broadly, energy futures have peaked and rolled over. **Figure 16** shows **gasoline futures (blue)** again, but this time plotted with **natural gas (brown)** and **propane (teal)** futures. All three are down over the last few weeks, suggesting that perhaps prices have peaked. This would be a welcome relief come winter in North America when we rely on propane, natural gas, and electricity (which is generated from fossil fuels) to heat our homes.

A final comment about oil. There is a narrative that oil companies have been taking advantage of the high prices. To test this narrative, we decided to look at the 10-Q filings for the largest oil refineries. For background, a 10-Q is a quarterly report that all public companies must file with the SEC. It discloses financial information for these companies.

First, we pulled info on the largest refining companies in the US. Here's the list per [EIA data \(Figure 17\)](#).

Figure 17: Largest Refining Companies in the US
Top 10 U.S. refineries operable capacity*

As of January 1, 2022

Rank	Corporation	Company	State	Site	Barrels per calendar day
1	Saudi Aramco	Motiva Enterprises LLC	Texas	Port Arthur	626,000
2	Marathon Petroleum Corp	Marathon Petroleum Co LP	Texas	Galveston Bay	593,000
3	Marathon Petroleum Corp	Marathon Petroleum Co LP	Louisiana	Garyville	585,000
4	ExxonMobil Corp	ExxonMobil Refining and Supply Co	Texas	Baytown	560,500
5	ExxonMobil Corp	ExxonMobil Refining and Supply Co	Louisiana	Baton Rouge	520,000
6	BP PLC	BP Products North America Inc	Indiana	Whiting	435,000
7	PDV America Inc	Citgo Petroleum Corp	Louisiana	Lake Charles	418,000
8	ExxonMobil Corp	ExxonMobil Refining and Supply Co	Texas	Beaumont	369,024
9	Marathon Petroleum Corp	Tesoro Refining and Marketing Co	California	Carson	363,000
10	Chevron Corp	Chevron USA Inc	Mississippi	Pascagoula	356,440

*Includes only refineries with atmospheric crude oil distillation capacity.

Source: [Refinery Capacity Report](#)

Next, we pulled the 10-Q data (**Figure 18**) for Marathon, Exxon, BP, and Chevron. Note that Saudi Aramco and PDV are not publicly-traded. BP is public but registered in the UK, and thus financial results are not available on the SEC database. Data for each of these companies can be found here: [Marathon](#), [Exxon](#), and [Chevron](#).

Figure 18: Financial Data for Select Oil Companies

		Q1 2021	Q1 2022	Change (\$)	Change (%)
Marathon Petroleum	Volume	2,565	2,833	268	10%
	Revenues	22,882	38,384		
	Expenses	22,665	36,668		
	Operating Profit	217	1,716	1,499	691%
	OP/Volume	8.5%	60.6%		
	OP/Revenue	0.9%	4.5%		
Exxon (Downstream)	Volume	3,751	3,983	232	6%
	Revenues	44,691	68,965		
	Expenses				
	Operating Profit	(390)	332	722	n/a
	OP/Volume	-10.4%	8.3%		
	OP/Revenue	-0.9%	0.5%		
Exxon (Upstream)	Volume	3,787	3,675	(112)	-3%
	Revenues	4,979	8,999		
	Expenses				
	Operating Profit	2,554	4,488	1,934	76%
	OP/Volume	67.4%	122.1%		
	OP/Revenue	51.3%	49.9%		
Chevron (Downstream)	Volume	2,317	2,544	227	10%
	Revenues	21,701	38,048		
	Expenses				
	Operating Profit	5	331	326	6520%
	OP/Volume	0.2%	13.0%		
	OP/Revenue	0.0%	0.9%		
Chevron (Upstream)	Volume	3,121	3,060	(61)	-2%
	Revenues	9,351	14,250		
	Expenses				
	Operating Profit	2,350	6,934	4,584	195%
	OP/Volume	75.3%	226.6%		
	OP/Revenue	25.1%	48.7%		

Here are some observations:

- First, differentiate upstream from downstream. Upstream refers to production of oil. Downstream refers to refining of oil. Marathon is a downstream company. Exxon and Chevron are involved in both upstream and downstream.

- Exxon and Chevron did not separately-state expense data for upstream and downstream, hence the darkened boxes.

- Production and refining volumes did not change much year over year (YoY). We have shaded volumes in blue.

- In all cases, operating profits jumped substantially YoY. With volumes mostly unchanged and profits up substantially, it initially looks like companies are generating more profits with the same output.

- But it is not entirely cut-and-dry. First, you have a low base year. 2021 figures occurred during a COVID surge, which distorted normal operating conditions. Thus, it may be unfair to compare YoY figures without taking into account the environmental context.

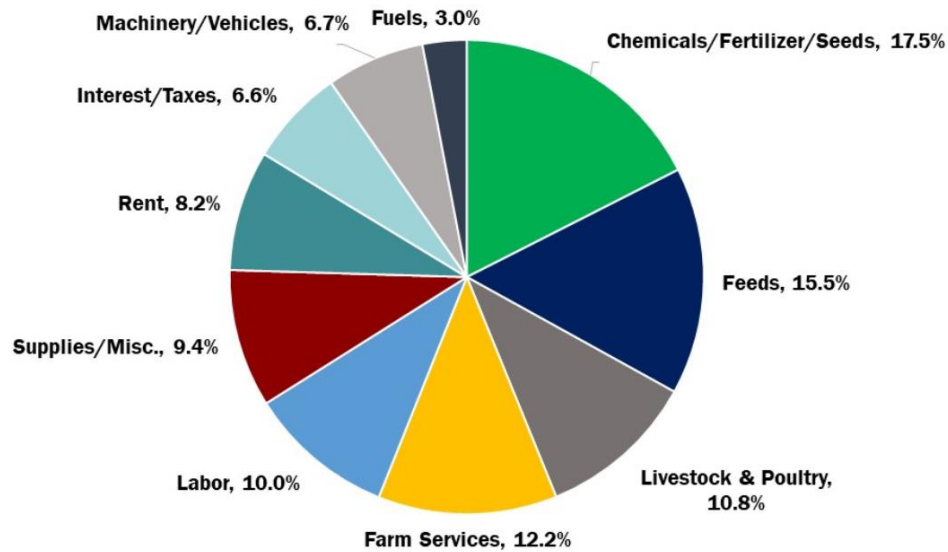
- Second, operating income as a % of revenue is largely similar YoY; these figures are shaded in dark green. In other words, revenue and profits stay proportional YoY. Put another way, this implies that the expenses to produce and refine oil went up YoY. This is the case for all companies except for Chevron's upstream operations.

- Yes, companies did have higher profits and revenues on similar volumes. But they also had higher expenses, in most case. And the base effects of Q1 2021 may distort the figures. In summary, it is difficult to conclusively say one way or the other that oil companies are solely to blame for rising prices at the pump.

Energy prices permeate almost every industry. It is the reason PPL and Met-Ed just jacked up electricity prices here in southeastern PA. It is the reason why plastics manufacturers face rising input costs as that industry relies on crude oil as a primary import. It is a reason why retailers charge higher prices to pay for increased inventory costs, as the primary means of transporting goods in the US is long-haul trucking. Everywhere we turn, energy is involved. As such, any relief in energy prices may be felt far and wide.

Now let's turn our attention to the other area where we most feel inflation: food. And when we think of food, we think of agriculture. Per the American Farm Bureau Foundation, these are the primary sources of cost for famers (**Figure 19**).

Figure 19: Farm Production Expenditures by Type



AMERICAN FARM BUREAU FEDERATION*

www.fb.org

Source: USDA NASS, 2020

The two largest inputs, fertilizer/chemicals and feeds, have seen drastic price increases over the past two years. [Feed prices were up 15.7% in 2021](#) (**Figure 20**). Fortunately, in 2022, prices are down (8.0%) thus far. High feed prices translate into higher livestock prices, which explains part of the large increase in meat prices at the grocery store.

Fertilizer (**Figure 21**), prices rose steadily throughout 2021 before skyrocketing in Q4 2021. Since Spring 2022, prices have started to moderate a bit, and in some case, prices have even started to fall. Fertilizer prices data can be found [here](#), [here](#), and [here](#).

Figure 20: YoY Change in Feed Prices

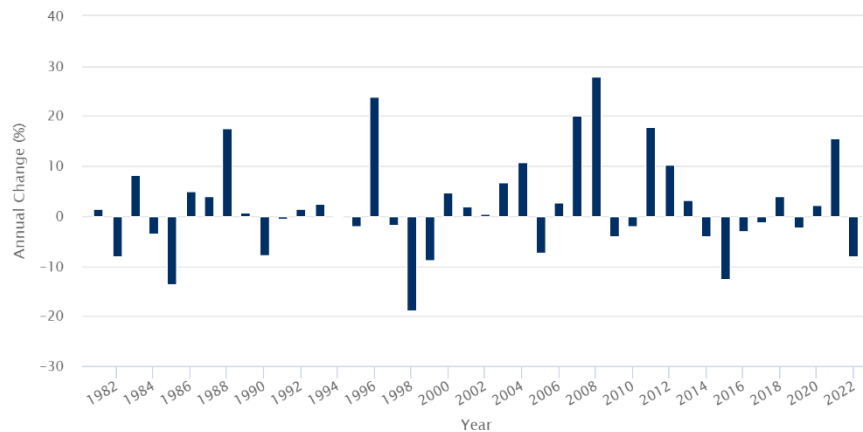
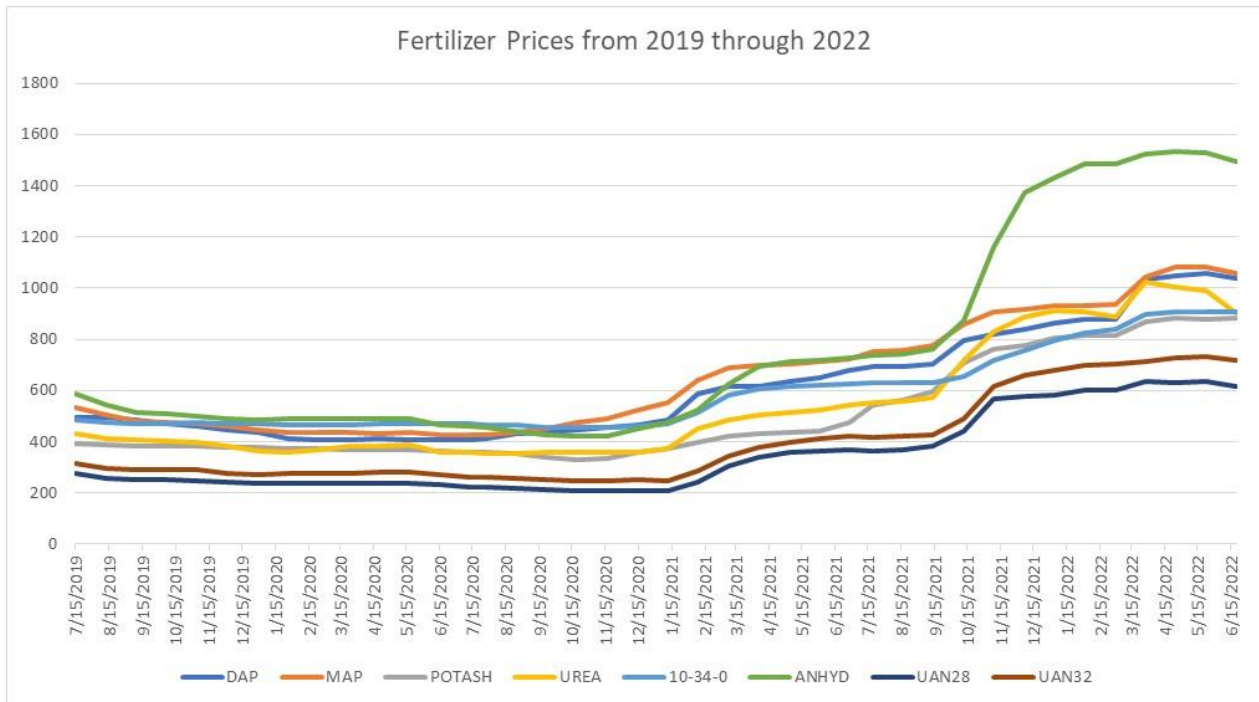


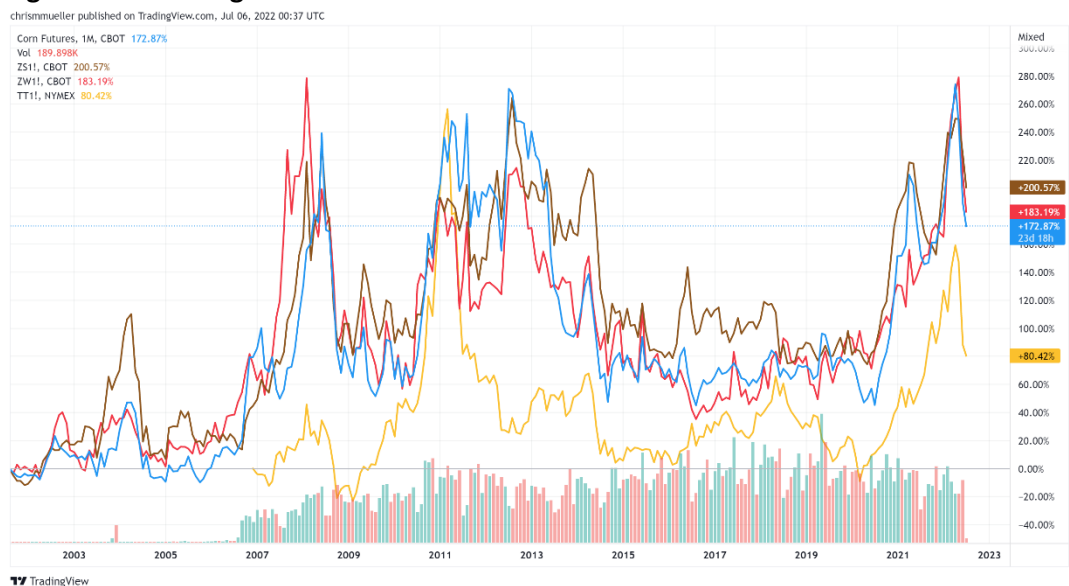
Figure 21: Fertilizer Prices from 2019 - 2022



The recent weakness in fertilizer and feed prices are a welcome development. But these price decreases will take time to bleed into food prices. High fertilizer prices are the inputs to plant crops today. Those crops won't be harvested for a few months. For farmers to recover their high costs, the prices for those crops must be high. Ditto for feed and livestock. Consequently, if feed and fertilizer prices continue to decline, we won't expect to see those decrease bleed into food prices until the latter part of 2022 and the early part of 2023.

One final note on agriculture prices (**Figure 22**). In recent weeks, futures prices for common crops like **corn (blue)**, **soybeans (brown)**, **wheat (red)**, and **cotton (gold)** have plummeted.

Figure 22: Select Agriculture Futures Prices



Elsewhere in inflation world, below is a chart to suggest housing prices may be peaking and rolling over.

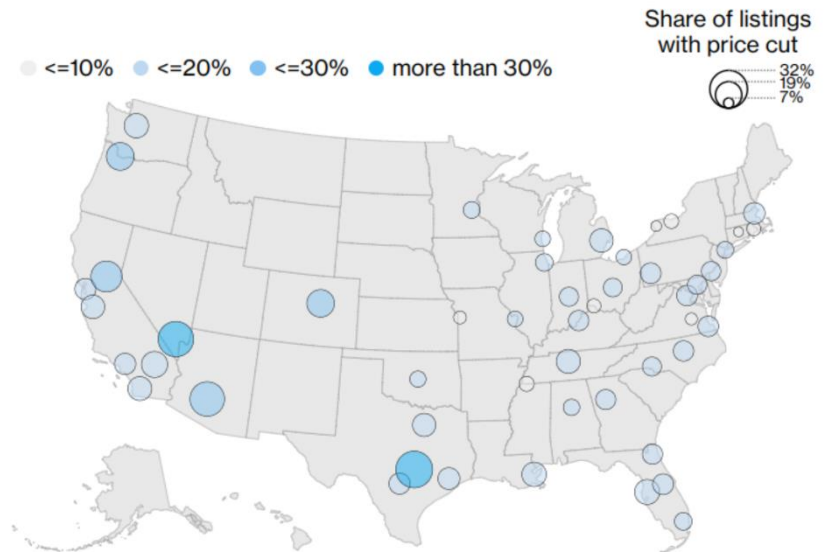
According to Realtor.com, home sellers are starting to reduce asking prices (**Figure 23**). Housing and rental costs have been a significant driver of inflation. When 30-year mortgage rates double in less than a year, housing becomes much less affordable. Seeing home prices start to moderate is a welcome sign. This is one of the first signs that housing prices could fall further.

Remember the massive amounts of congestion at the Ports of Long Beach and Los Angeles earlier in the year? Ships were docked off the coast, unable to deliver their goods to the docks because there were not enough dockworkers and truck drivers to go around.

Figure 23: Changes in Housing Prices

Expecting Less

In the biggest metros, home sellers are slashing prices to attract buyers

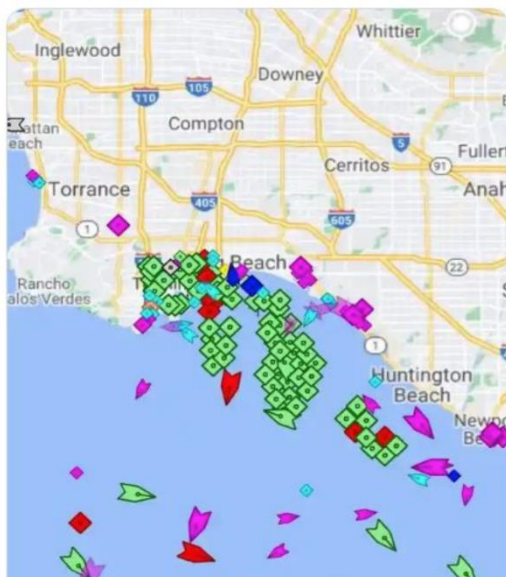


Source: Realtor.com

Well, that logjam has completely unwound. Courtesy of Craig Fuller of FeightAlley (By the way, Craig is a great follow on Twitter. Lots of insightful commentary on the supply chain.), here is a side-by-side of the Port of Long Beach from September 2021 (left side) and June 9, 2022 (right side) (**Figure 24**).

Figure 24: Activity @ Port of Long Beach

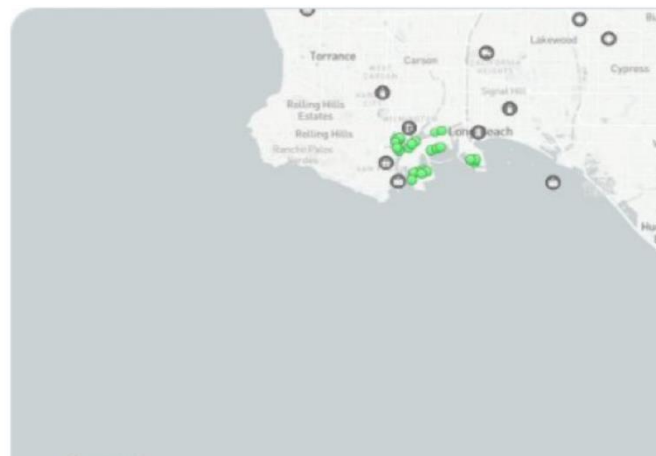
This is what the situation outside LA/LB looked like last September



John Paul Hampstead

@JPHampstead

and just like that... the ships are gone



One final note on inflation. The 5-year breakeven and 10-year breakeven Treasury rates are a widely-viewed proxy for future inflation. Loosely-interpreted, the breakeven rate is essentially the average expected rate of inflation over the next 5- or 10-years. So the 5-year breakeven, for example, is an approximation of the average expected annual inflation over the next five years. Here is a chart (**Figure 27**) of the **5-year (blue)** and **10-year (teal)** breakeven rates along with **CPI (gold)**.

Figure 27: 5- and 10-Year Breakevens vs. CPI



There are a couple of things we would like to point out:

- CPI generally increases. There is always baseline inflation in the economy. This is a good thing.
- Sometime inflation decreases, like it did during the Housing Bubble and the COVID crash. Note how the gold line (e.g. CPI) decreased during these times.
- A bad thing is when inflation increases too quickly. Note how the CPI line has a steeper slope since 2021. This is a sign that inflation accelerated.
- Note also that the 5-year and 10-year breakevens increased as rapidly as the CPI during this time. There is a strong correlation between the movement of inflation and the movement of the breakevens.
- Lately, breakeven rates are declining. As a matter of fact, as of the date this is being written, the 5-year breakeven rate is down YTD, from 2.78% to start the year to 2.62% today. Ditto for the 10-year, which is down from 2.48% to 2.37%. In other words, if this recent trends persists, the market is sending signs that inflation could be moderating.

In summary, inflation remains a primary, if not the pinnacle, concern of the economy at the moment. However, signs are emerging that inflation may have peaked.

Interest Rates

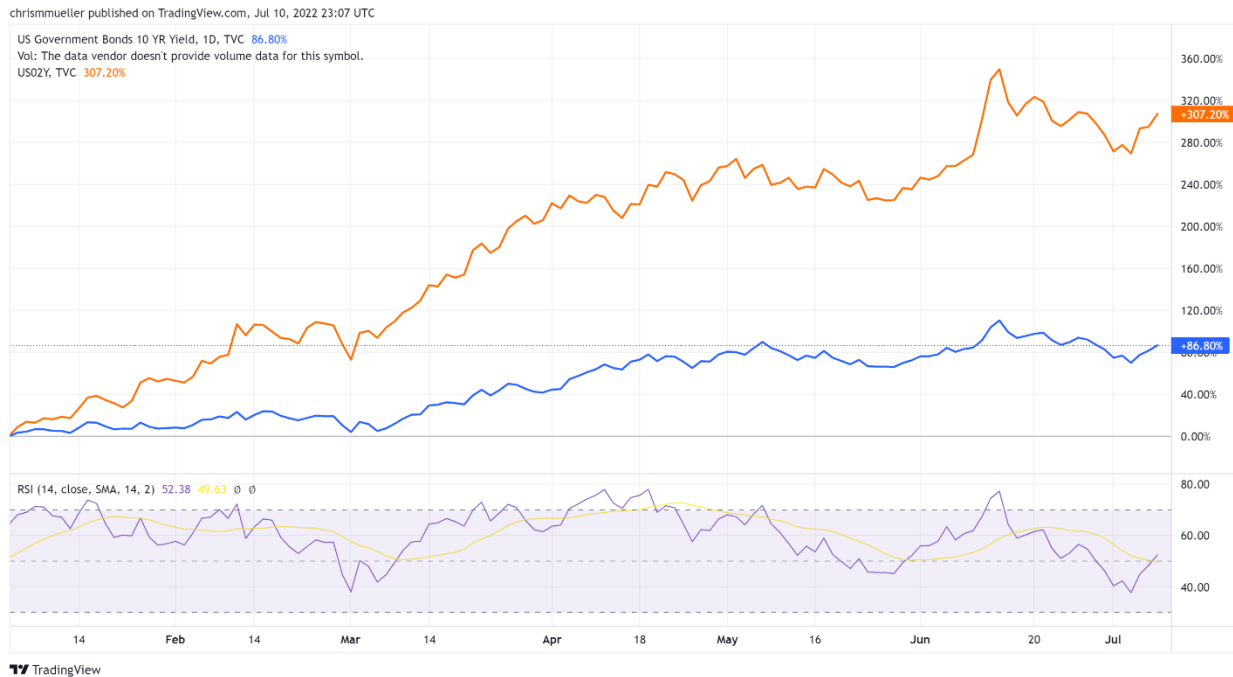
In our semi-annual report for December 31, 2021, we extensively covered interest rates. With this edition, we'd simply like to highlight a few areas.

The move up in the **2-year** and **10-year** Treasury yields has been nothing short of epic this year. The yield on the 2-year is up over 300% for the year, from 0.733% in January to 3.111% now. The 10-year is up almost 100%, from 1.515% to 3.084% (**Figure 28**). There is little precedent for the magnitude of these moves over such a short period.

Bond vigilantes will pound the table, saying bonds have not been a safe haven investment. However, even with the monumental yield increases in 2022, returns on bonds are roughly half those of stocks – in a good way. See the market performance summary on page one of this report for YTD returns. Yes, bonds are down ~10% for the year, but that's half the pain experienced by stocks.

Bonds will, from time to time, experience a drawdown. But the expectation is that that drawdown will be quite less than the drawdown on stocks. This year is a case study in this theory. And considering those monumental yield increases, we'd argue that bonds outperformance this year is remarkable.

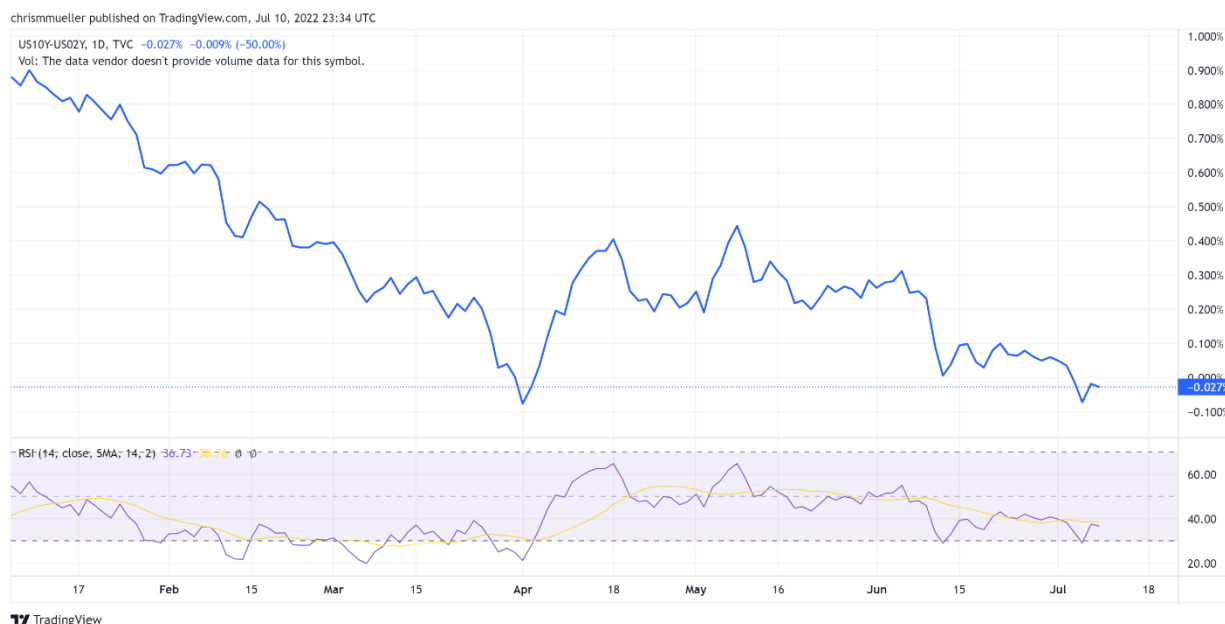
Figure 28: 2022 YTD Increase in 2- and 10-Year Treasury Yields



Finally, in previous editions of our report, we discussed yield curve inversion. Inversion is simply when long-term interest rates are lower than short-term interest rates. Without belaboring the point, inversions are rare, and they have a strong track record of predicting recessions.

Since January, the 2 Yr / 10 Yr curve has inverted twice; this is evidenced by the curve moving into negative territory in late March and July. (**Figure 29**). Bespoke compiled an excellent comparison of the predictable ability of inversions at various points on the yield curve (**Figure 30**).

Figure 29: 2022 Yield Curve Inversions on 2-Yr / 10-Yr Yields



Suffice it to say, when certain portions of the curve invert, it's a certainty, or near certainty, that recession follows.

For example, let's use the 2-Yr / 10-Yr inversion we highlighted above. In 98.0% of all the times when the 2-Yr yield moves higher than the 10-Yr yield (e.g. inversion), recession follows.

We'd argue that 98% is good odds. But if you want certainty, strive for 100%. Notice that whenever long-dated, particularly 30-year, rates are lower than very short-term – 1 month, 3 month, 1 year – rates, the odds of recession are 100%.

In the current rates markets, the yields on very short-term – 1 month, 3 month, 1 year – debt are very low relative to long-term – 20-year and 30-year – debt. In other words, there's little signs of inversion occurring between very short-term and long-term debt. And it's those very inversions that have the best predictive ability.

Figure 30: Inversions' Predictive Power for Recession

Recession Probability by Yield Curve: Since 1970			
Yield Curve	% of Time a Recession Ensued in the 2 Years Following Inversion	# of Inverted Trading Days	Reading as of 7/1 (bps)
30Y vs 1Y	100.0	1525	42
30Y vs 3M	100.0	531	143
30Y vs 1M	100.0	178	184
20Y vs 1M	100.0	162	208
10Y vs 1M	100.0	338	162
5Y vs 1M	100.0	453	162
2Y vs 1M	100.0	487	157
20Y vs 3M	99.9	903	168
10Y vs 1Y	99.8	2699	20
30Y vs 2Y	99.4	1429	26
10Y vs 3M	99.2	646	122
10Y vs 2Y	98.0	1572	5
5Y vs 1Y	97.1	2731	20
2Y vs 1Y	96.4	1759	15
20Y vs 1Y	96.1	3099	66
5Y vs 2Y	94.0	1883	5
5Y vs 3M	93.5	826	122
10Y vs 5Y	92.7	2693	0
30Y vs 5Y	91.7	1430	22
1Y vs 1M	90.8	468	142
2Y vs 3M	88.2	924	117
20Y vs 2Y	85.5	1916	51
1Y vs 3M	84.1	14936	102
30Y vs 10Y	83.6	1678	22
20Y vs 5Y	78.5	3689	46
20Y vs 10Y	71.2	3903	46
3M vs 1M	53.9	873	40
30Y vs 20Y	46.1	5654	-24

So what's going on? The 2 yr / 10 yr has inverted twice in 2022 alone. It has 98% predictive ability. But other very short-term / long-term rates aren't even close, and they have a perfect predictive record. There's a simple explanation: very short-term rates are artificially distorted right now.

When the Fed meets every eight, all the news outlets drool over the interest rate guidance from the Fed. Normally, this stuff is pretty mundane. But right now, it's super important. Why? The Fed controls very, very short term rates (e.g. Fed Funds Rate). And 1-month, 3-month, and 1-year Treasury rates are highly correlated to the Fed Funds Rate. What the Fed Funds Rate does, the 1-month, 3-month, and 1-year Treasuries also do.

Conversely, the Fed has no control over long-term rates. The 20- and 30-year rates are purely dependent on market forces, not the whims of the Fed.

Enter the [Taylor Rule](#). Per the [FRED database](#) maintained by the St. Louis Federal Reserve Bank (an excellent treasure trove of data!), the Taylor rule is "a simple formula that John Taylor devised to guide policymakers. It calculates what the federal funds rate should be, as a function of the output gap and current inflation." In plain English, the Taylor Rule uses observable market-based inputs to **guide** policymakers on setting the Fed Funds Rate. Remember, the Fed can set the Fed Funds rate wherever it wants. The Taylor Rule uses market-based data not subject to manipulation by the Fed. The Fed **can** use the Taylor Rate for guidance, but it **isn't** obligated to.

Observe this chart from the FRED database. It shows Taylor Rule rate, the Fed Funds Rate, and the 30-year Treasury Rate (**Figure 31**). There's something lurking on the righthand side of the chart.

Since the post-WW2 era, the **Fed Funds Rate** (controlled by the Fed) has virtually mirrored the **Taylor Rule rate** (based solely on market data). But, look at the massive divergence between the two since 2020.

Figure 31: Taylor Rule, Fed Funds Rate, and 30-Year Rate



The skyrocketing Taylor Rule rate suggests the market is screaming for the Fed Funds Rate to be much higher. However, the Federal Reserve, who have sole discretion to set the Fed Funds Rate, have only recently started to raise the rate.

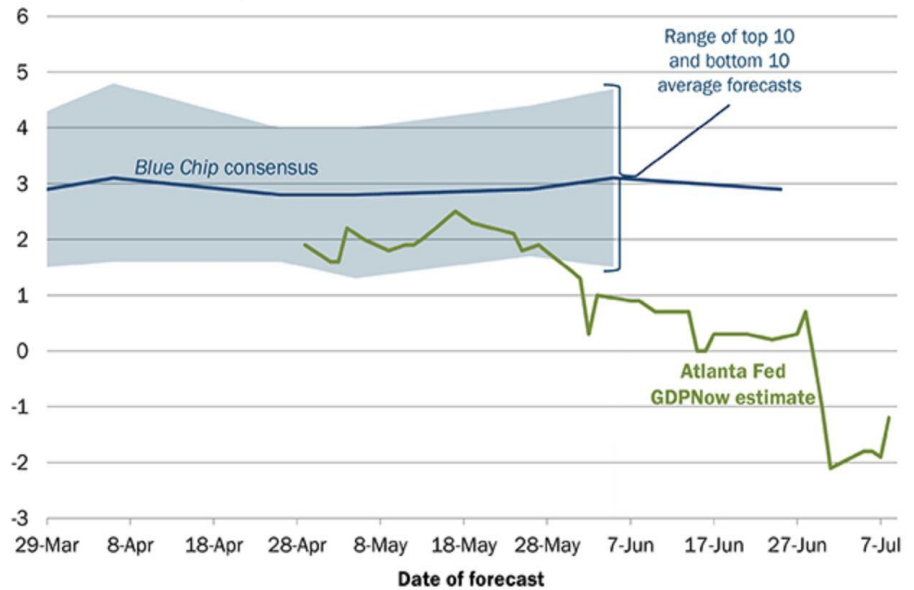
Why is the Taylor Rule rate so high? Simple, it uses inflation as an input. Thus, when you hear things like “The Fed is behind the 8 ball on inflation,” what that really means is the market-based rate (Taylor Rule) is saying inflation is a problem that warrants a higher Fed Funds Rate, but the Federal Reserve has refused (until recently) to raise that rate. **The Fed has been ignoring market-based data.**

Back to our correlations. Recall that the 1-month, 3-month, and 1-year Treasury rates are highly correlated to the Fed Funds rate. If the Fed has been keeping the Fed Funds rate artificially low based on the Taylor Rule, than it stands to reason that the 1-month, 3-month, and 1-year Treasury rates are also artificially low. And if these rates are artificially low, it explains why inversions between long-term rates and very short-term rates haven’t taken place. **If the Fed followed the guidance of the Taylor Rule, we would have already seen inversions between very short-term and long-term rates.**

In **Figure 31**, we circled each instance where the Fed Funds Rate was higher than the 30-year rate (causing an inversion). Notice that each instance was followed by a recession (recessions are shaded in gray). If the Fed had been pegging the Fed Funds Rate to the Taylor Rule lately, we would have seen an inversion between the Fed Fund Rate and the 30-year rate. And that is way the Bespoke inversion chart may need an *asterisk. Because it’s hard to fight Fed policy.

So Bespoke’s inversion probabilities may not technically say we are in a recession or heading for one. But as we established above, that’s due to the Fed holding down the Fed Funds Rate. Nevertheless, we’d argue that we’re already in a recession. [Q1 2022 GDP](#) printed at (1.6%). Based on the Atlanta Federal Reserve Bank’s GDPNow prediction model (**Figure 32**), [Q2 2022 GDP](#), which has yet to be announced, is predicted to come in at (1.2%). Guess what: a recession is defined as two consecutive quarters of negative GDP growth. But hey, there’s a silver lining: compared to past recessions, (1.6%) and (1.2%) is pretty darn good for a recession.

Figure 32: Atlanta Fed GDPNow Model of Q2 2022 GDP
Evolution of Atlanta Fed GDPNow real GDP estimate for 2022: Q2
 Quarterly percent change (SAAR)



Sources: Blue Chip Economic Indicators and Blue Chip Financial Forecasts
 Note: The top (bottom) 10 average forecast is an average of the highest (lowest) 10 forecasts in the Blue Chip survey.

For a little balance, let's end with a little inflation levity. Two inflation Tweaks to wrap things up...

Rishesh Singh @androsForm · Jun 6

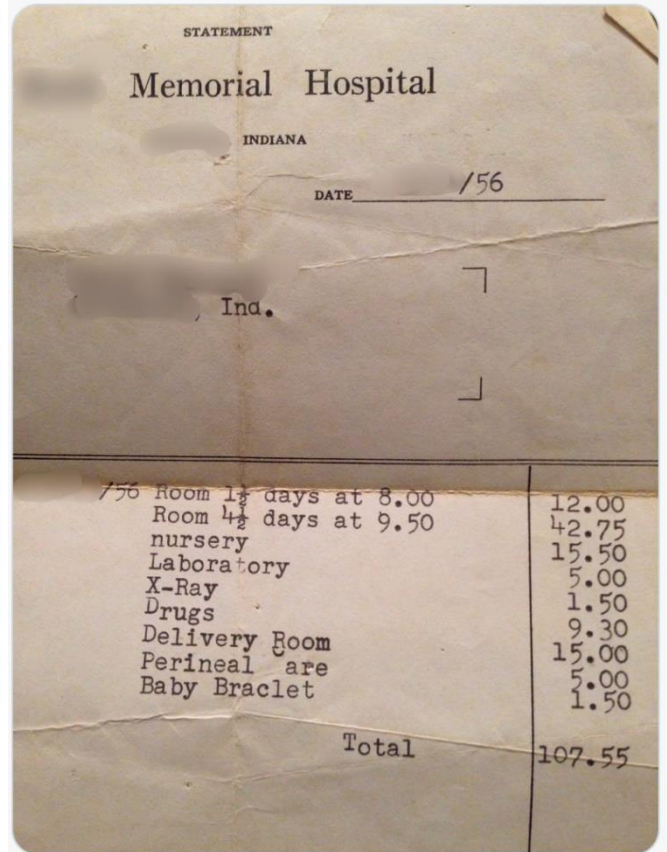
John Rambo would totally crush inflation



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... Jameson Lopp @lopp · May 21

Hospital bill for delivering a baby + 1 week recuperation in 1956.



459 890 5,542

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Stock investing involves risk including loss of principal.

No strategy assures success or protects against loss.