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Working Paper

Inflation: Everywhere and Always Differential

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Economics from the Top Down

new ideas in economics and the social sciences

Inflation: Everywhere and Always Differential

Blair Fix

December 15, 2022



In November 2021, I wrote a post called [‘The Truth About Inflation’](#). At the time, inflation fears were heating up. And as usual, mainstream economists were missing the bus.

Sure, economists pointed to the consumer price index and said, “Look, it’s going up!” But they didn’t look under the hood of this index to see the big picture. Despite what economists proclaim, inflation is not a uniform increase in prices. It is an *instability in the whole price system*.

It’s now been a year since that post was published, so I thought I’d update the analysis. While much has changed in the global political landscape, the underlying picture of inflation remains the same: it is everywhere and always differential.

US inflation, post Covid

Throughout its history, the United States has suffered many episodes of inflation. Still, the current bout feels particularly insulting. Post-Covid inflation is a bit like a car crash on the way home from the hospital. It is *not* what the doctor ordered.

For many heterodox economists, the situation is particularly frustrating because it seemed like Covid finally killed the [deficit myth](#). Faced with the need to finance lockdowns, governments around the world converged on an obvious solution: they paid people to stay home. The fact that this money was created from thin air didn’t seem to bother anyone.

All in all, Covid spending was a nice demonstration of a simple truism: government fiscal constraints are almost always political. It's not that governments *can't* end poverty by printing money and giving it to the poor. It's that during normal times, the rich would scream bloody murder if the government did so. Fortunately, Covid times were not normal. And so despite the fact that many people lost their jobs during lockdowns, throughout the pandemic, poverty actually [decreased](#). That's the beauty of creating money and giving it to the poor. It makes them less poor.

Or at least, that's how it works in practice. In *theory*, economists have other ideas about how the government printing press works. You see, in the eyes of free-market gurus, government spending is inherently unproductive. As Austrian economist Robert Murphy [puts it](#):

government spending ... merely return[s] resources to the private sector that had previously been taken from it.

In other words, governments can't actually create wealth. So when they print money, they create nothing but inflation.

Unfortunately, it seems that post-Covid history played into the hands of free-market economists. Figure [1](#) illustrates. Here, the blue curve shows the movement of the US consumer price index since January 2020. After a brief period of deflation during the first round of lockdowns, prices held steady until late 2020. Then the federal government passed two massive Covid relief packages, financed through deficit spending. Since this money was created by government — an apparently 'unproductive' institution — it could lead to only one thing: *inflation*. And so it did. Shortly after the Covid relief money was doled out, prices surged.

If I was a free-market propagandist, I'd leave the story there. Deficit spending creates money but doesn't produce anything new. Therefore, government deficits always lead to inflation. Case closed. Government is bad. The free market is good.

Fortunately, I don't write free-market propaganda, so I won't leave it there. The story told by Figure [1](#) is simple, plausible, and almost surely wrong. But as is usual in science, understanding what makes this simple idea wrong takes more effort than promulgating the idea itself. So let's put on our thinking hats and dive into the evidence.

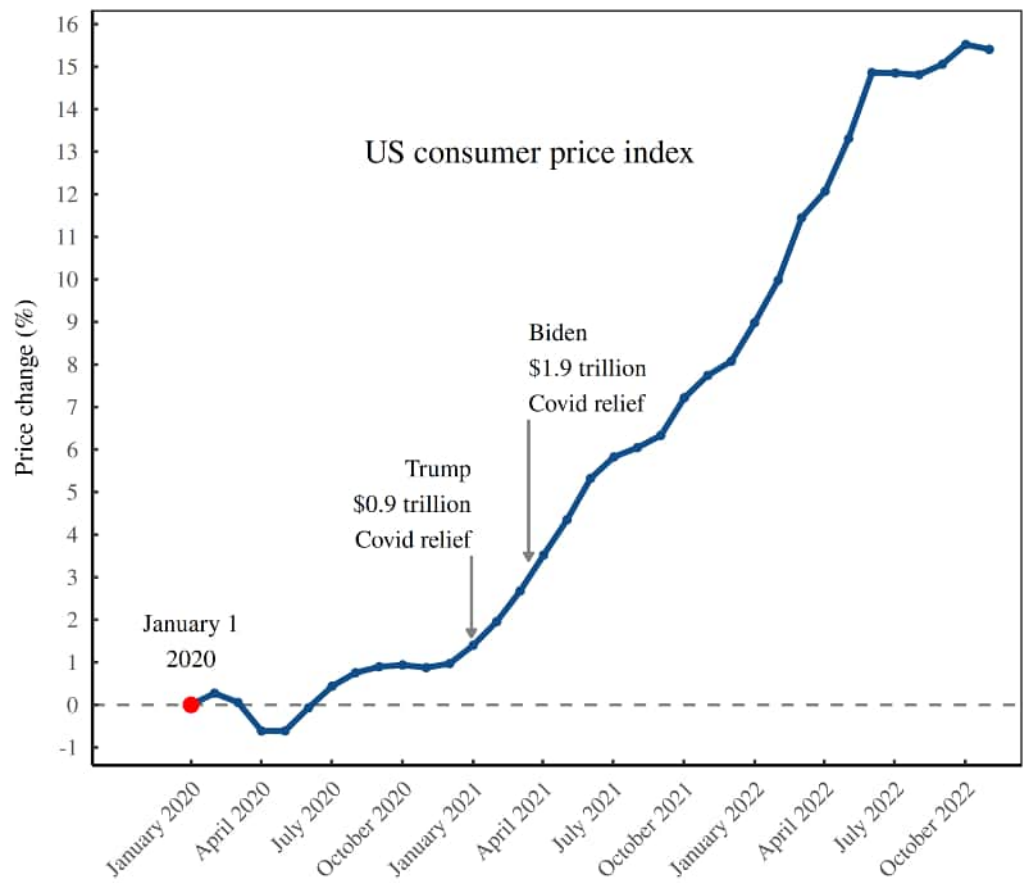


Figure 1: The US consumer price index since January 2020

Here’s one story you could tell about post-Covid inflation. Prior to 2021, there was no inflation problem. But after the US government unveiled two massive, deficit-financed relief packages, inflation started to surge. Silly government. Didn’t it know that (public) money creation is always inflationary? [Sources and methods](#)

Are government deficits inflationary?

In 1940, the world experienced an El Niño. In 1941, the US declared war on Germany. Therefore, El Niño causes war.

Um, no.

This reasoning is called [cherry picking](#) and is a scientific sin for obvious reasons. Given enough data, I can almost always find a moment when event A coincides with event B. But this timing doesn’t mean that A caused B.

If we want to establish causation, we need to show that there is an actual pattern — that many observations of A coincide with many observations of B. In other words, we need to look at the *totality* of data and demonstrate a correlation between A and B. If there is no correlation, there's no evidence for causation.

In Figure 1, I've cherry picked data where deficit spending coincides with inflation. If my inference is sound (that deficit spending causes inflation), we expect to find the same pattern throughout history. Deficit spending should correlate with inflation.

The problem is that it does not.

Figure 2 runs the numbers for recent US history. The top panel shows the rate of US inflation, as measured by the consumer price index. The bottom panel shows the federal deficit, expressed as a percentage of federal expenditure. If you squint hard, you might convince yourself that there's a pattern. But statistics suggest otherwise. The correlation between inflation and deficit spending is -0.13 , a value that is both trivially small (it is not statistically significant) and headed in the wrong direction from what free-market gurus would like. (A rise in deficit spending is weakly associated with a *decline* in inflation.)

Inflation is a business strategy

So there's no statistical relation between deficit spending and US inflation. If this fact surprises you, it's because you're thinking like Milton Friedman — the free-market guru who famously blamed inflation on the supply of money. If there's too much money being printed, Friedman proclaimed, prices will go up.

The idea sounds convincing, but has a fatal flaw: it has no predictive power.

We'll get to the math in a moment. But let's start with a simple example. Suppose that the government runs a lottery financed through deficit spending. Whenever there is a winner, the government prints cash and hands it out.

Let's imagine you win the lottery and head to your local bar to celebrate. When you get there, two things could happen:

1. You hand the bartender a wad of cash. He reciprocates by giving everyone in the bar a round of beer.

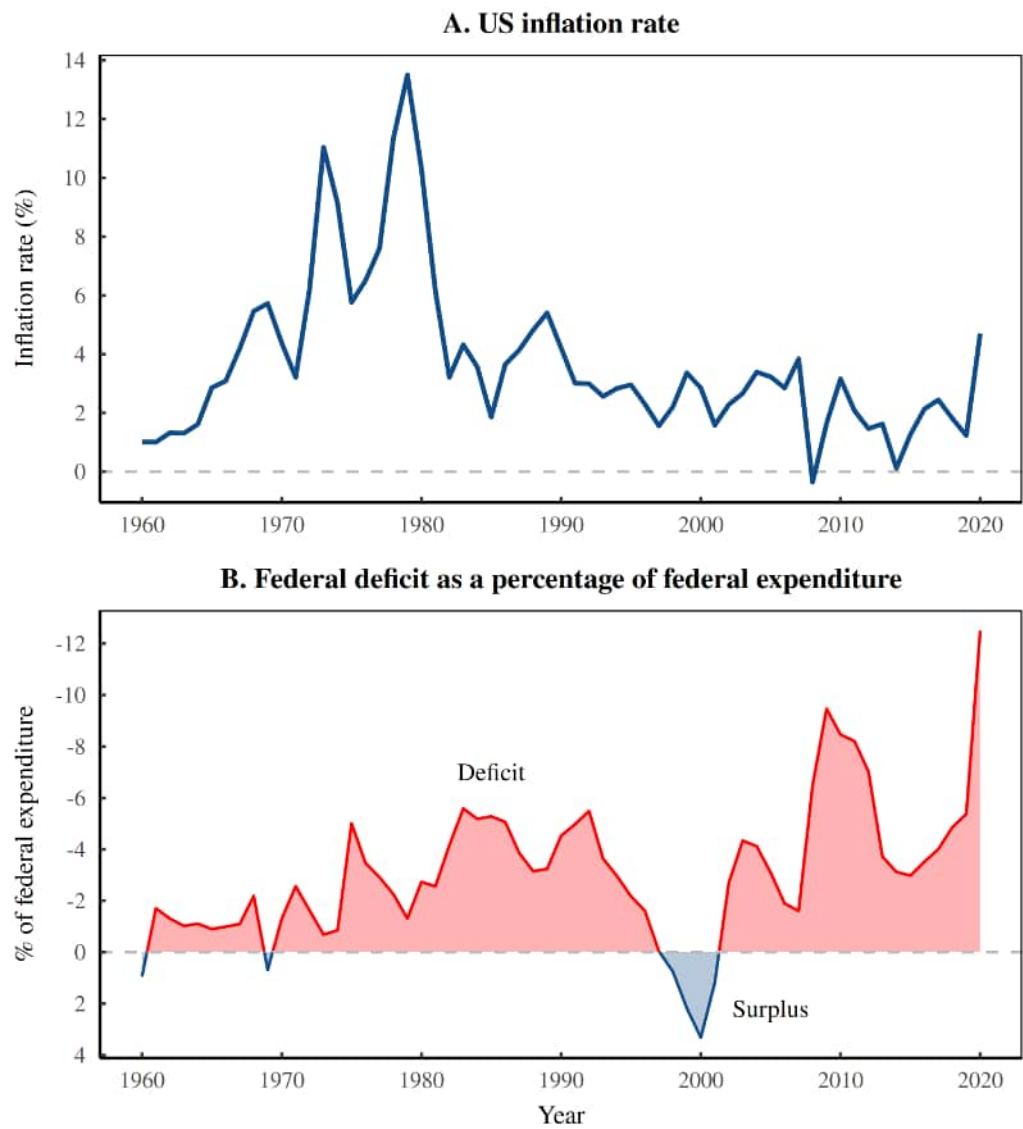


Figure 2: Deficit spending is not inflationary

This figure compares the US inflation rate (top panel, measured using the consumer price index) to the size of the federal deficit (bottom panel, measured relative to federal expenditures). The correlation is trivially small ($r = -0.13$) and headed in the wrong direction from what deficit hawks would like. Higher inflation is (very weakly) associated with lower deficits. [Sources and methods](#)

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2. You hand the bartender a wad of cash. He reciprocates by raising prices and giving you *one* very expensive mug of beer.

The purpose of this story is to illustrate a simple point; we cannot start with a quantity of money and predict what will happen to prices. Instead, it's only *after* we've seen the business reaction that we can say anything about inflation. This is the reality embedded in Milton Friedman's favorite equation:

$$MV = PT$$

According to this formula, if we know the quantity of money M and its 'velocity' V (the rate that money changes hands), we can predict the price level P . The catch, however, is that we must first know T . Unfortunately, T is no small thing. It tracks the scale of all transactions, assuming prices remain constant. Basically, T is a broader version of 'real GDP'.

Do you see the problem? Uncle Milton's equation makes no predictions about inflation. It merely puts formal math to what we already know with words. If the quantity of money increases but we *don't* sell more stuff, we know that prices must increase. But if the quantity of money increases and we *do* sell more stuff (in exactly the same proportion), then we know that nothing happens to prices. In short, the result of printing more money depends not on the money itself, but on the strategy pursued by business.

Breadth vs. depth

In our lottery example, the bartender has two choices when taking your cash. He can:

1. Sell more beer
2. Raise the price of beer

Capital-as-power theorists Jonathan Nitzan and Shimshon Bichler call these two strategies *breadth* (sell more stuff) and *depth* (raise prices). They note that in mathematical terms, both approaches lead to the same outcome: a business takes your cash and profits from it. However, the social effects of each strategy are very different.

In general, the strategy of 'breadth' is socially sanctioned. In other words, if you give a business more money, the social norm is that you will get back more stuff. Indeed, this norm is so strong that it is codified as a kind of 'natural law' in neoclassical economics. The assumption is that competition

is so vicious that firms cannot raise prices without being undercut by rivals. As a consequence, economists treat breadth (selling more stuff) as the main route to profit.

Of course, this thinking is a fantasy. Businesses raise prices all the time. For example, in 2015, [Martin Shkreli](#) (aka ‘pharma bro’) bought the license for the anti-parasitic drug Daraprim and hiked the price from \$13.50 to \$750 per pill. It was a prudent business decision. After all, the demand for most drugs is fairly stable, so the best route to profit is to jack up the price.

Shkreli’s decision led to predictable public outrage, in part because the size of his price hike was outrageous, but also because Shkreli didn’t follow the normal playbook when justifying his actions. You see, savvy business leaders know that blatant price gouging is a social taboo. And so when they raise their prices, they do it under the banner of ‘cost increases’. “Sorry customers”, they say, “our costs are up and we have no choice but to pass them on to consumers.” The fact that their price increase also pads profits is a happy ‘accident’, buried in the company’s annual report. Shkreli’s mistake was to drop the normal ruse and revel in his price-setting power.

So despite what neoclassical economics claims, the reality is that businesses are constantly pursuing strategies of both breadth and depth. They try to sell more stuff. And they hedge their bets by also trying to raise prices.¹

Sometimes, though, the strategy of ‘depth’ starts to dominate. When that happens, we get a kind of herd behavior in which price gouging effectively becomes socially sanctioned. “Look,” businesses say, “everyone else is raising prices, so we have to do it too.” In a sense, business owners are right. When a herd of buffalo stampedes, the individual animals must run or risk being trampled. And so it is with the herd behavior we call inflation. When the strategy of ‘depth’ starts to dominate business behavior, every business must raise prices or risk losing out.

Now, the interesting thing about this social behavior is that when you are in its midst, it feels like the herd is being *pushed*. In other words, it seems like there is some external force that is driving businesses to raise prices. Uncle Milton then comes along and justifies this feeling. The herd *is* being pushed, he says, and the culprit is the supply of money.

¹Nitzan and Bichler note that ‘selling more stuff’ doesn’t actually require producing more things. In fact, it’s often better to achieve breadth simply by buying up other companies. That way you kill two birds with one stone: your sales go up, and you eliminate some of your competition.

It's a nifty trick that gets businesses off the hook for their collective behavior.²

Of course, I'm not claiming that inflation lacks a cause. When buffalo stampede, it's because a few animals got spooked. But the stampede that follows has less to do with the initial stimulus and more to do with the buffalo's collective reaction. And so it is with inflation. Once the inflation stampede gets going, it has a life of its own. The business herd pushes itself.

A differential stampede

When it comes to characterizing inflation, price indexes (like the CPI) are the equivalent of treating a buffalo stampede like a point particle. Sure, you can do it mathematically — you take the motion of thousands of animals and collapse it into an average 'particle movement'. But that doesn't mean the average is informative. Quite the opposite.

A key feature of a stampede is the roiling dynamics within it. If you average away these dynamics, you're making the phenomenon seem falsely simple, paving the way for misguided explanations of what's going on. Uncle Milton's theory of inflation — which collapses everything to the supply of money — is a case in point.

The way to combat this averaging problem is quite simple: we put the price-change average in the context of the wider stampede. Figure 1-all does so for the recent bout of US inflation.

Here, the black line shows the increase in the US consumer price index since January 2020. It's the same data as in Figure 1, but looks quite different here. Why? Because as a backdrop to the CPI 'point particle', I've plotted the whole price-change stampede. It's an impressive mess to behold. Each colored line represents the movement of one 'animal' — the price of a single

²Almost daily, I'm reminded that many people think of inflation as an exogenous force. For example, last week, I was at the grocery store paying for food when the cashier looked at the total and scoffed.

"These prices are ridiculous," she said.

Her reaction struck me as odd, given that the store's prices weren't just increasing on their own. The grocery chain (Sobeys) has been actively raising prices. But I suspect she didn't see things that way. When the store bumps up prices, I'm sure the managers claim they're just passing along greater costs. It's a happy coincidence, then, that the profits of Sobeys' parent company, EmpireCo, are [up 28% from 2020](#).

Nothing to see here folks. Just passing along the costs of profit to unwitting consumers. These aren't the droids you're looking for. Move along.

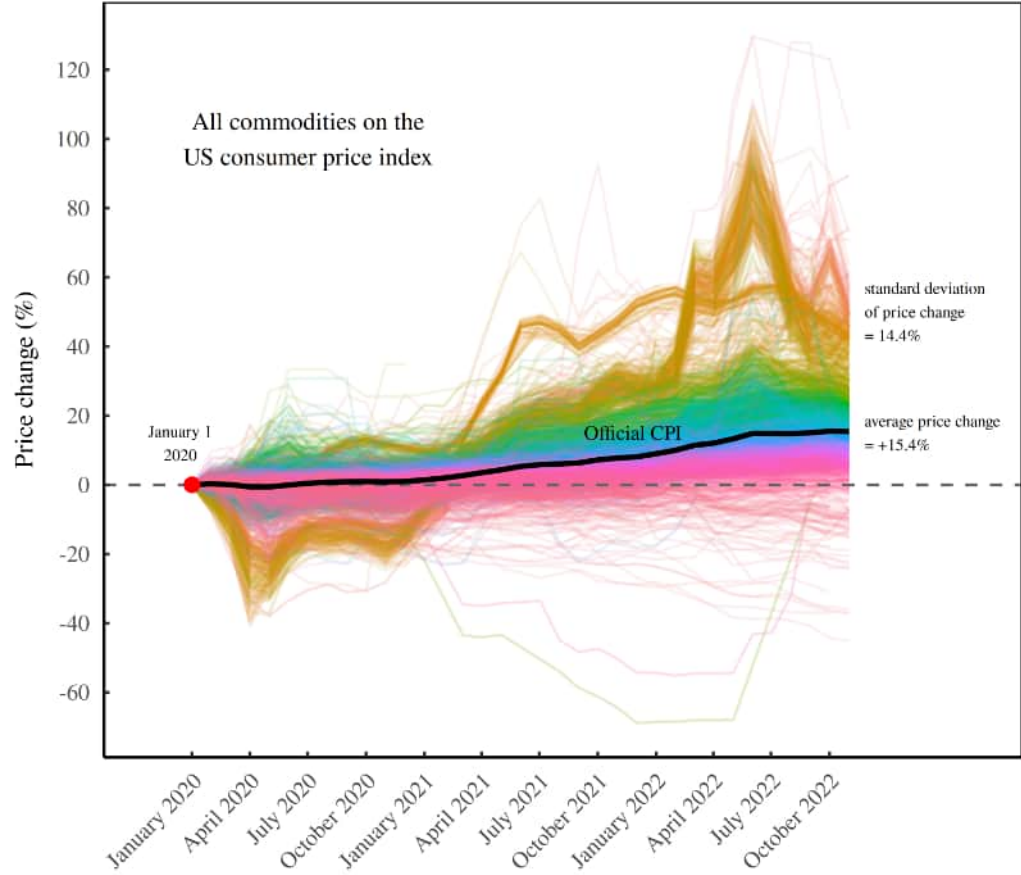


Figure 3: A differential stampede

This figure contrasts the movement of the US consumer price index with the full stampede of differential price change. Each colored line indicates the price movement of an individual commodity tracked by the Bureau of Labor Statistics. We can see that the price stampede is wildly differential. Summary stats back up this feature: among this group of commodities, the standard deviation of price change is as large as the movement of the average price. In other words the average conceals more than it reveals. [Sources and methods](#)

commodity tracked by the Bureau of Labor Statistics. As it turns out, the roiling movement of the price stampede utterly dwarfs the movement of the price index.

Looking at Figure 1-all, I find it quite difficult to tell a simple story about cause and effect. Sure, I could claim that the government’s Covid stimulus is to blame for inflation, having pumped ‘too much’ money into the economy. But this simple explanation has a big problem; it must show how a single quantity of money caused prices to go in all sorts of directions. To me, that seems like a logical impossibility.

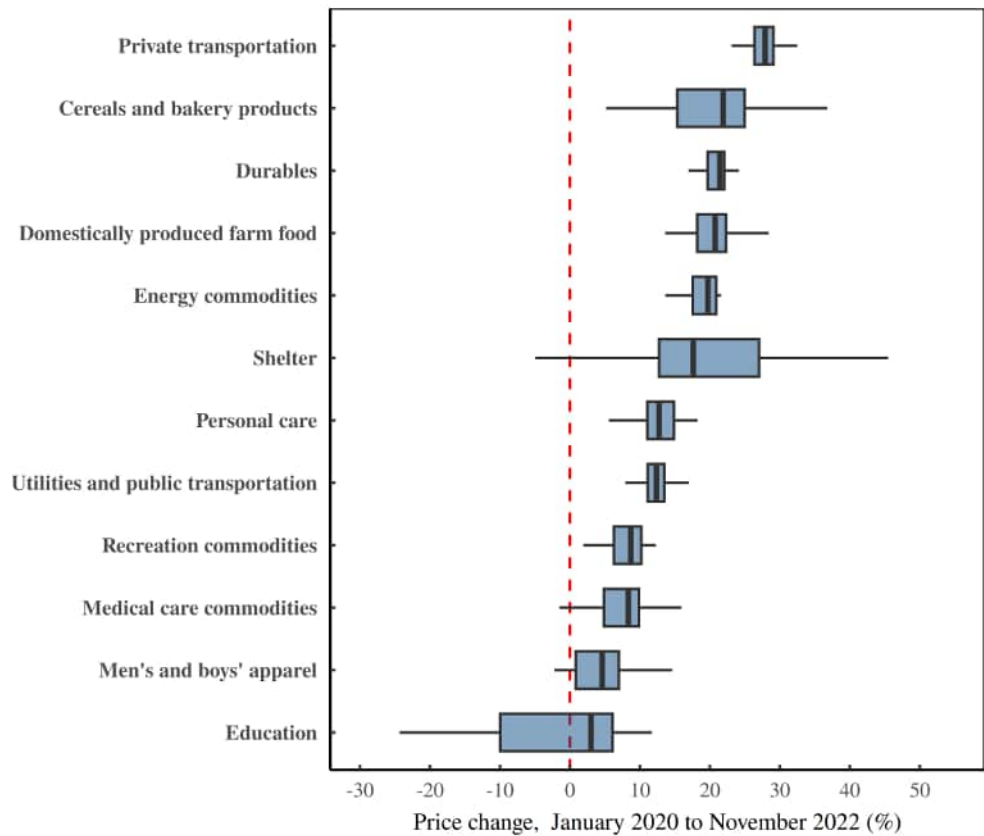


Figure 4: Subgroups within the price stampede

This figure visualizes price change variation (since January 2020) between major commodity groups tracked by the Bureau of Labor Statistics. In each boxplot, the vertical line indicates the median price change. The ‘box’ shows the middle 50% of the data. The horizontal line shows the range of price change, excluding ‘outliers’. [Sources and methods](#)

Before jumping to conclusions about inflation, a better approach is to actually study the price stampede. As Figure 4 shows, there are clear patterns amidst the chaos. Here, I’ve taken the price change shown in Figure 1—all, and aggregated it by major commodity group. We can see that some commodity groups, like ‘education’, have experienced hardly any inflation. Yet other commodity groups, like ‘private transportation’, have seen a massive price spike.

What explains the patterns in Figure 4? I don’t pretend to have an answer. But I do know that the first step towards understanding is to actually study the differential nature of inflation, rather than papering it over with a single price index.

Nothing new here

Although you may be seeing the evidence for differential price change for the first time, there is nothing particularly special about post-Covid inflation. When we look at past inflationary bouts in the US, we find a similar pattern. Inflation is always a stampede and never an orderly march.

Figure 5 shows some examples. Each panel plots a different period of US inflation. The black line shows the movement of the consumer price index. The colored lines show the price change of individual commodities, which is wildly differential. (Note that as we go back in time, the Bureau of Labor Statistics tracks fewer commodities, meaning there are fewer colored lines.)

Froth within the herd

To be clear, when I plot the full picture of differential price change, I'm not saying that the average rate of inflation is a useless statistic. Even when data is extremely noisy, it's useful to measure the average. But in general, the noisier the data, the more important it is to put the average in context.

Unfortunately, economists have a habit of ignoring this context. The reasons are largely ideological. When we measure the froth within the herd, we open up sticky questions about distribution. For example, if we put income growth in the context of income inequality, we remind ourselves that capitalism is rather unfair. If you *don't* want that reminder, you ignore the income froth and pretend that the movement of the average is all that exists. That's why economists have historically tended to ignore inequality and focus on economic growth.

Economists do the same thing with inflation, largely for the same reasons. When you measure the price-change froth, you must admit that inflation is complex. And perhaps more importantly, you must admit that it *redistributes income* — a reality about which economics textbooks are mute.

We'll get to this redistribution in a moment. But first, let's take one final look at the froth within the inflationary herd. Continuing our animal analogy, imagine that we had a birds-eye view of a stampede — a view that tracked the average motion of the herd. From this view, we then freeze out the aggregate motion of the stampede, and isolate the froth within the herd.

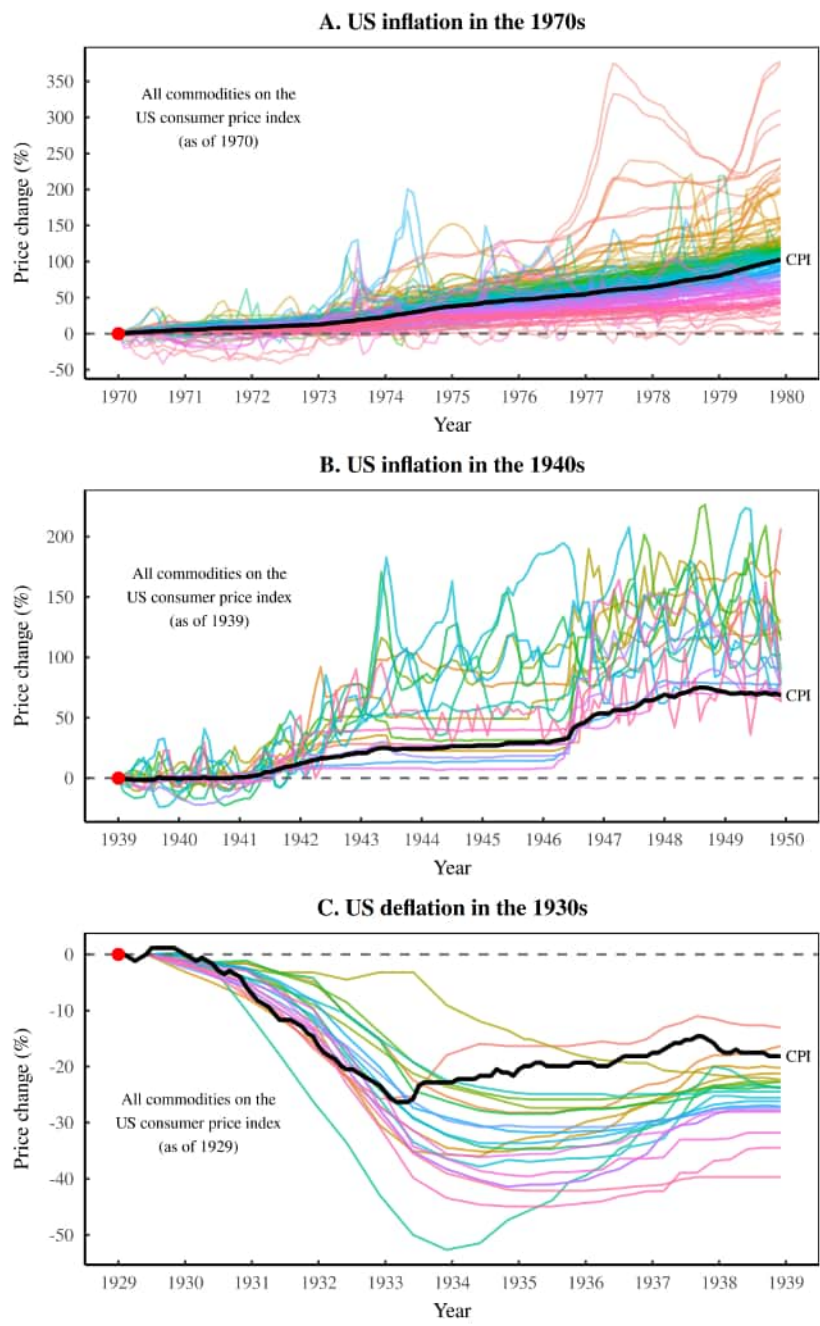


Figure 5: Three snapshots of US inflation

This figure shows snapshots of commodity-level price change during three periods in US history: the 1970s (top); the 1940s (middle); and the 1930s (bottom). In each plot, the black line shows the movement of the official consumer price index. The colored lines show the price change of all commodities tracked by the Bureau of Labor Statistics, as of the indicated year. Note that the official CPI is not always in the middle of the price-change range, especially towards the end of the time period shown. That’s caused by the addition of new commodities (not plotted here) that pulled the CPI up (or down). In other words, the data plotted here underestimates the price-change spread. [Sources and methods](#)

Applying this idea to inflation, the consumer price index represents the average motion of the inflation stampede. The deviation from this average (among individual commodities) represents the froth within the business herd.

Figure 6 quantifies this froth. Here, the histogram measures the price-change spread around the consumer price index, using all available data since 1913. The resulting distribution makes clear that inflation is wildly differential. To reliably capture the price movement of 95% of commodities, we need a band of about 30% uncertainty around the movement of the CPI. In other words, the consumer price index tells us very little about the dynamics of prices.

Inflation creates winners and losers

Just as some animals get trampled during a stampede, some people lose during bouts of inflation. It's easy to imagine how it happens.

Suppose, for example, that the price of beer grows more rapidly than the price of wine. It follows that beer drinkers will see their purchasing power drop more quickly than wine drinkers. In the game of inflation, beer drinkers lose. At the same time, when the price of beer goes up, beer *sellers* win.

Beyond specific groups of consumers and businesses, it's also possible that whole classes of people benefit from inflation. On that front, the recent bout of inflation has led to record corporate profits. Figure 7 shows the numbers in the US. After a brief dip during the first round of lockdowns, the profit share of national income (blue) increased rapidly. Over the same period, the wage share of national income (red) was roughly constant.

The fact that profits are up amidst inflation has some economists questioning received wisdom. For example, a recent New York Times article [asks](#), “Is ‘greedflation’ rewriting economics, or do old rules still apply?”

The answer depends on how we define the ‘old rules’. If we mean the ‘rules’ laid out in Econ 101, then the answer is ‘no’. Those rules have never applied to anything in the real world. However, if by ‘rules’ we mean past empirical trends, then the answer is ‘yes’. Greedflation is nothing new. Bichler and Nitzan have been [documenting](#) its existence for decades.

Figure 8 shows their most recent analysis illustrating the connection between US inflation and corporate profits. Let's break it down. The dashed line shows the rate of inflation, measured by the wholesale price index. The black line

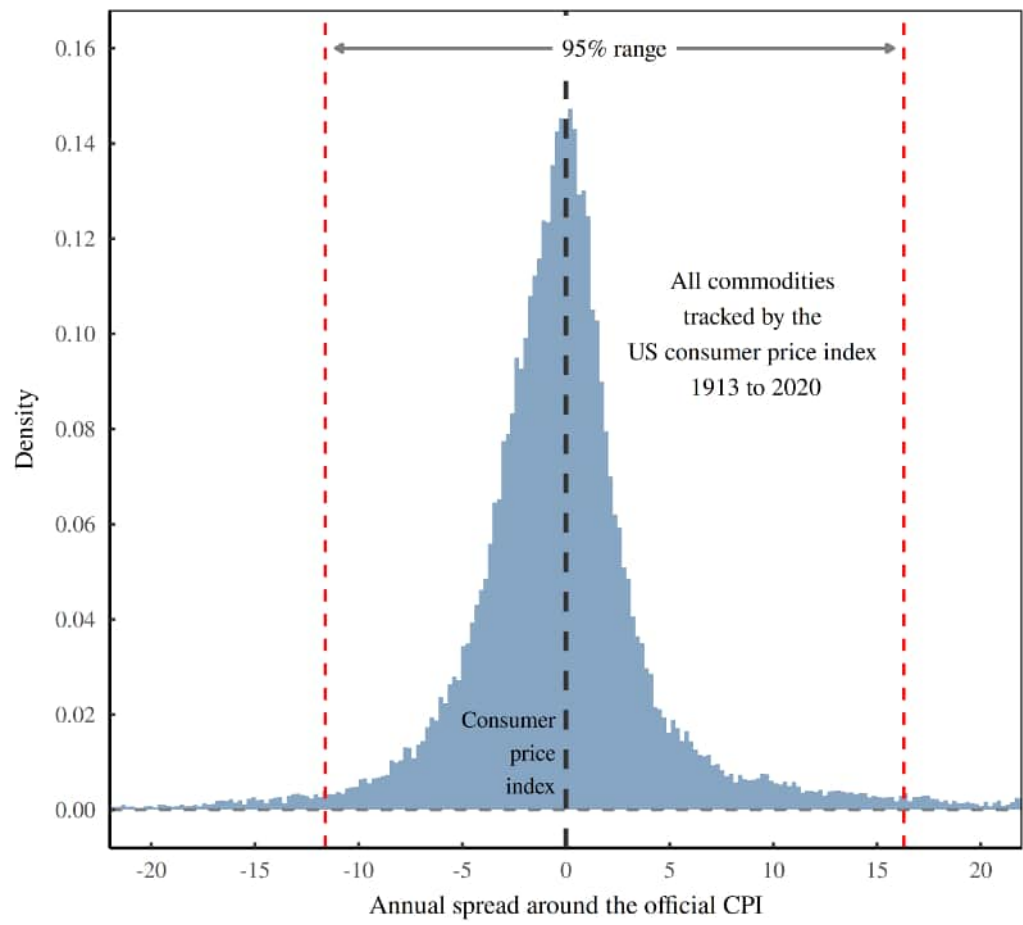


Figure 6: Froth within the herd

This figure shows the spread in commodity-level price change around the official consumer price index. Here’s how the analysis works. In each year since 1913, I measure the annual price change for every commodity tracked by the Bureau of Labor Statistics. Then I calculate the difference between this price change and the change in the official consumer price index. The histogram then shows the distribution of this price-change spread around the CPI — the froth within the herd. In quantitative terms, the movement of the CPI is surrounded by a band of about 30% uncertainty. Remember that whenever you hear reports about inflation. [Sources and methods](#)

then plots the short-term relation between corporate profits (measured in terms of the earnings per share of S&P 500 firms) and the wage rate. The connection between the two series is fairly obvious. When inflation increases, corporate profits rise relative to wages. Greedflation is the norm.

(For more examples of Bichler and Nitzan’s inflation research, see this [forum thread](#).)

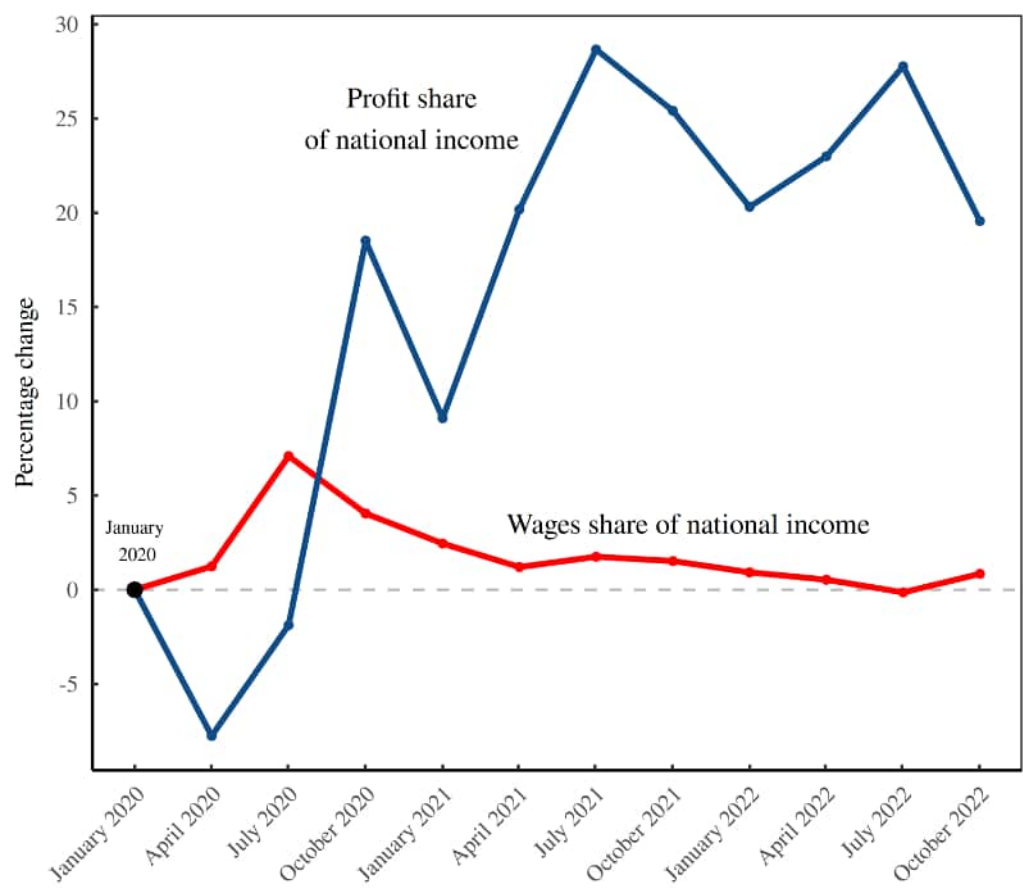


Figure 7: Corporate profits are up

This figure shows how the composition of US national income has changed over the last two years. The blue line shows the percentage change in profit share of national income, measured since January 2020. The red line shows the percentage change in the share of wages and salaries. [Sources and methods](#)

A strategic stampede

Let’s wrap things up. As a rule, your best bet for understanding the real world is to forget what you read in economics textbooks. Instead, pay attention to what the powerful say when they talk amongst themselves.

On that front, CEOs have been explicit that inflation isn’t some exogenous force, driven by the money supply. It’s a game that they actively play.

As a case in point, take William Meaney’s recent [comments](#) to investors. Meaney, the CEO of an information management company, claimed that he’s been ‘praying for inflation’ because it’s a good excuse to raise prices:

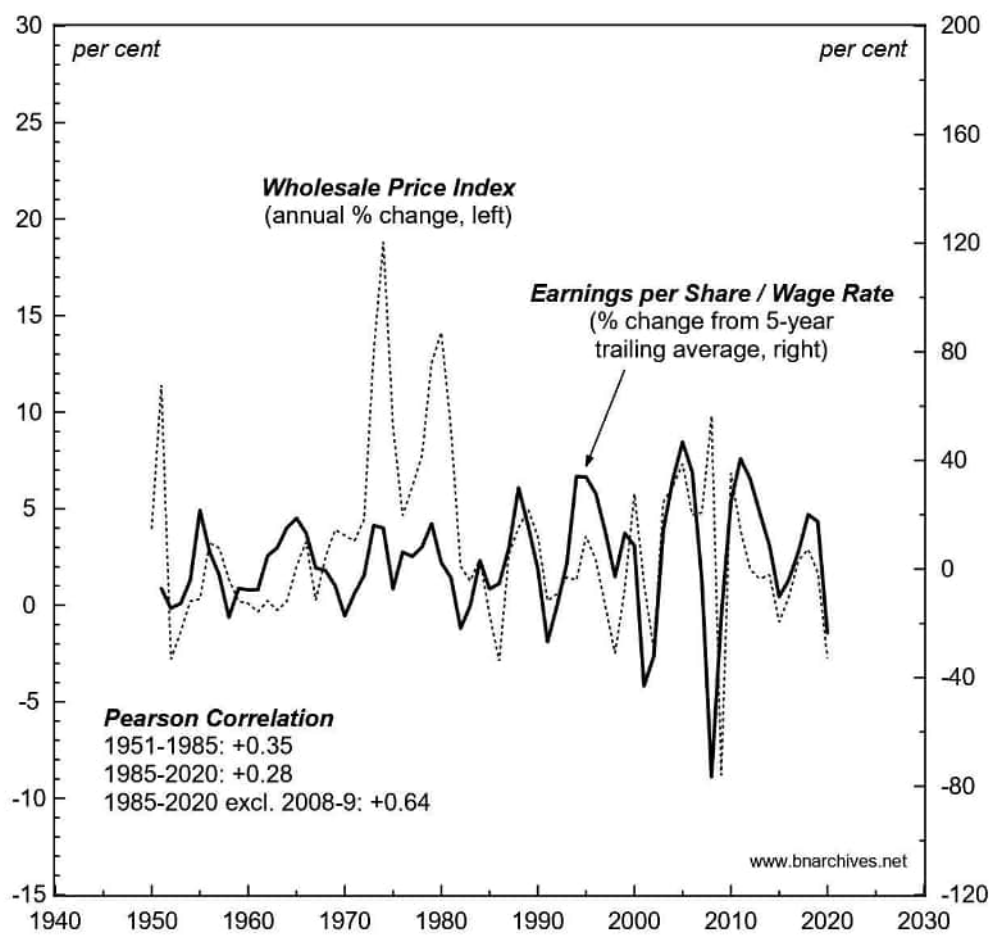


Figure 8: Greedflation is the norm

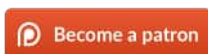
This is Bichler and Nitzan’s figure, which illustrates the connection between US inflation and the balance between profits and wages. The dashed line shows the rate of inflation, as measured by the wholesale price index. The black line is a bit more complicated, so let’s break it down. First, Bichler and Nitzan take the average earnings per share of the S&P 500 — a measure of the profitability of the largest US firms. Then they divide these earnings per share by the average wage rate. Finally, Bichler and Nitzan measure how this ratio departs from its 5-year-trailing average. The reason for this last step is that the ratio has a long-term secular trend that is unrelated to inflation. Details about their sources and methods are available [here](#).

Where we’ve had inflation running at fairly rapid rates, we’re able to price ahead of inflation.

In other words, forget the money supply. Inflation is a business strategy.

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Sources and methods

Data for commodities on the US consumer price index comes from the Bureau of Labor Statistics. I downloaded every unique series from their [bulk-download facility](#), and then aggregated it into a single database. For the analysis of individual commodities, I used the lowest level of aggregation. In other words, I kept all commodity groups that did *not* have a subgroup.

Data for US federal deficit spending as a share of government expenditure is calculated from FRED series [FGEXPND](#) and [M318501Q027NBEA](#).

Data for profit and wage share of US national income is from the Bureau of Economic Analysis, [Table 1.12](#). Note that I've used corporate profits before tax, without capital costs adjustments.

Further reading

Nitzan, J., & Bichler, S. (2009). *Capital as power: A study of order and creorder*. New York: Routledge.