What is Inflation? (a primer).

By Jim Devine, March 30, 2022

On March 10, 2022, the U.S. government's Bureau of Labor Statistics (BLS) reported an inflation rate of 7.9 percent between February 2021 and February 2022, as measured using the Consumer Price Index for Urban Consumers (the famous CPI). As the economics pundits stress, this was one of the highest CPI inflation rates in the U.S. since the 1970s. Energy costs and vehicle prices are leading the inflationary way (with food costs lagging a bit).[1] But what does this mean? That is, what are economists saying when they talk about inflation? What does *not* count as inflation? What are major types of inflation and their causes? What is "hyperinflation"? What is deflation and how can it be disastrous? What does the Federal Reserve (a.k.a., the Fed) do? What are the Fed's policies for reducing inflation? This primer answers these questions, with some comments that interpret current events (as of late March, 2022).

1. The CPI. Many see inflation as the same as "high prices." But to economists (including those at the BLS), this is incomplete. First, inflation refers to high prices *only* when they are "high" compared to *past* prices. Usually, these comparisons are made relative to 12 months earlier (so this is the "year over year" rate), leaving out the normal month-to-month wiggles. Second, even though the sticker shock of rising grocery prices (or those of gasoline or cars) can be painful, economists don't define inflation using the prices of individual items or even a small group of products. Inflation refers to rising prices for the entire economy (all newly-produced goods and services for sale) – or for a large portion of that economy (usually that producing consumer products).

Then, "inflation" then refers to a rise of the *average* price for the chosen chunk of the economy. For this average, the impact of soaring prices of groceries, gasoline, or gas-guzzling cars might be canceled out if the prices of other items are falling or rising at a slow rate. Recently, for example, slow price rises for medical products dragged down the average. Thus, the over-all inflation rate was lower than the growth rates of the prices of gasoline, food, or gas guzzlers.

[1] See https://www.bls.gov/news.release/cpi.nr0.htm. (This website is updated every month.)

The CPI reported above is the average price of a standardized "basket" of goods and services most often purchased by urban consumers.[2] It's possible to apply the same kind of logic to calculate the average price of a basket bought by the filthy rich, stressing the role of caviar, Dom Pérignon, yachts, trips to Davos, etc.[3] But our focus is on the prices that urban consumers pay.

The CPI does not include petroleum pumped from the ground, iron ore dug up in a mine, or hog bellies. These are "commodities," so that when their prices go up (on average), it's called raw material or commodity price inflation. This can be important, but as far as urban consumers are concerned, it's only the delayed impact of this kind of inflation of the CPI that matters.

The CPI also does not measure the prices of buying houses, stocks, bonds, or other assets.[4] It's true that "housing price inflation" occur (as after year 2000 in the U.S.), as do crashes (as with after 2006). Similarly, stock prices can surge upward for months or even years (in what's called a "bubble"), followed by a crash. But these stories refer to asset price inflation. In contrast, when most people talk about "inflation," they usually mean increases in the "cost of living," the prices we pay buying the goods and services as part of our day-to-day lives.

But the CPI and the "cost of living" are not synonymous: the prices used in calculating the CPI do not capture all of the costs of our living in our world. We do not live by store-bought bread alone. We also benefit from the existence of public libraries, the security brought by the unemployment insurance system, clean air, and our relationships with our friends and families. Because none of these are bought and sold on the market, they don't have a price except perhaps a small fee (for example, for library cards). This means they can't be added up and then counted as part of the CPI. Thus, the cost of living can rise for due to reduction in library hours, more restrictive payment of unemployment insurance benefits, increased air pollution, and/or less satisfying social relationships (because of being stuck at home by Covid). Thus, "cost of living inflation" can be faster than officially-measured CPI inflation.[5] For example, my estimate of the "cost

[2] The calculation of the CPI is much more complicated than this. But such details are irrelevant here.

[3] The business magazine Forbes uses a more polite name (https://www.forbes.com/2008/09/16/cost-living-well-lists-400list08-cx_fs_0917clewi.html). Others have calculated the price of the gifts in the "Twelve Days of Christmas" (https://holidappy.com/holidays/Twelve-Days-of-Christmas-Items-and-Cost).

[4] Instead of including the price of buying a house, what's counted is the price of renting it.

[5] Note that many of these problems are more likely to hit impoverished areas with little economic and political power (i.e., those where the poor and ethnic minorities dwell). This where for businesses dump their toxic wastes (and the like) and for government services to be inadequate. But the standard CPI does not address such issues.

of living" inflation rate – which pays attention to such matters – was higher than that for the CPI between 1983 and 2000.[6]

Another factor missed when we use the CPI is so-called "shrinkflation." This occurs, for example, if a business shrinks the size of a candy bar or cuts the quality of the cat food (typically without changing the price). Firms do this to lower their costs and to avoid raising prices. To the extent that shrinkflation occurs, the CPI can underestimate how high prices are and thus the rate of inflation. However, the BLS puts a lot of effort into correcting for quality changes: their calculation of the prices of the candy bar and cat food would be higher to reflect the lower quality. (Paying a lower price for products of lower quality is the equivalent to paying a higher price for those of higher quality.) In my humble opinion, the BLS does a good job here. But when inflation is getting worse (or "accelerating"), the BLS recalculations may fall behind, so that the BLS-adjusted inflation rate is higher than what we see. This may be happening in 2020-22.

A final factor that's left out of the CPI calculation and can lead to underestimates of inflation is shortages.[7] If there is any kind of stickiness in prices, increases in demand can lead to shortages for some items (as with the recovery from the Covid recession). A big example can be seen for the U.S., which had about 2 percent inflation during the years 1944 and 1945. That seems to be a significant achievement – especially given the strong demand for products. But this story ignores the fact that wartime price controls often implied empty shelves. (Businesses won't supply if they see their profits as inadequate.) This kind of hidden inflation raised the cost of living for many – as did the system of non-price rationing (non-market distribution of goods and services) that prevailed during the war. Of course, except for profit-hungry black marketeers and the like, people were willing to pay these costs as part of the war effort.

Since most economists, politicians, and journalists ignore non-market inflation, shrinkflation, and shortages, my discussion below is about usual, i.e., the CPI and the related inflation rate.

2. Purchasing Power. Instead of seeing the CPI as the price of a standard bunch of items that consumers buy, let's simplify by treating it here as the price of a "widget." This imaginary item represents the average or typical consumer product available on the market. (We might use the

[6] See my article in *Challenge* magazine, March-April, 2001: JD-2001-COLinflation.pdf.

[7] Alert readers will note that I never address the use of wage-price controls in this primer. The problem with those programs is that price rises are simply replaced by decreased quality and/or shortages. The problem simply changes its form. Controls also work better if the price-wage spiral has a bigger role in the inflationary hangover (see below).

"schmoo" instead, but the widget is familiar from Econ. 101.) This staggeringly unrealistic simplification should remind us that this primer uses abstraction (just as will all of economics). That is, something is being left out of the story: our story may describe truth, but it isn't the *whole* truth. We must hope that the omissions are minor.

Given this, the CPI equals the amount of money required to buy a widget. So, the purchasing power of money is the flip-side of the price (its mathematical inverse). As the CPI goes up, more money is required to buy a widget: the power of each individual dollar to purchase widgets falls. Consider an example, supposing that the price of a widget (our CPI) equaled $1 in year A. That means that one dollar had the power to purchase one widget during that year.[8] If it the CPI rises to $1.10 in year B, it then takes $1.10 to buy a widget. In terms of purchasing power, $1 can only buy only approximately nine tenths ($1/$1.1 ≈ 0.91) of a widget in B. Here, the purchasing power of money falls by ten percent between the two years. As explained next, this is ten percent inflation. (It should be obvious that the inflation rate is exaggerated to make the math easier.)

3. The Inflation Rate. If the CPI measures the length of a string around a balloon (its circumference), then "inflation" refers to the growth of the size of the balloon over a period of time; the faster that prices are rising (the faster the inflation rate), the more rapidly that the balloon grows. The inflation rate is the percentage increase of the CPI. For those who like formulas, the simplest one says the inflation rate between years A and B equals (the change in the CPI between years A and B) divided by year A's CPI. In our example, the CPI equaled $1 in year A. Its rise to $1.10 in year B represents a ten percent inflation rate between the two years. If inflation continues at the same rate into year C, the CPI equals $1.21 for that year (ten percent higher than $1.10). In year C, the purchasing power of money is again lower than in year B: one dollar can purchase only 1/$1.21 or about 0.83 widgets per dollar (compared to about 0.91). Usually, economists use the word "inflation" as short-hand for "the inflation rate."

4. Hyperinflation. If we have hyperinflation, the balloon grows so quickly that it "pops." Of course, this metaphor is far from being realistic: what happens instead is that prices double again and again during a short period such as a year – or even a month. This means that the purchasing power of government-backed (fiat) paper money and coins to fall so quickly (and often in such

[8] Usually, the price of the basket is set equal to 100 in a specific "base" year to make it more readable and easier to use in comparisons. Note that the numbers in my example are fictional and were chosen to make the math easier.

unpredictable ways) that people stop using it. They ask: if it doesn't have any power to purchase anything, why use it? They then start using foreign currency, gold, canned food, or some other safe asset instead. Some people may even use barter despite its costs. This in turn slows the operations of the economy, i.e., the production and distribution of goods and services.

Stories of hyperinflation are popular with anti-inflation militants: they want to talk about German consumers shopping using big baskets of cash during 1923. Some see hyperinflation as arising due to policy-makers' stupidity or moral failing – and then say that "if they had been following my policy, the hyperinflation would never have occurred."[9] But not only is hyperinflation relatively rare, but it arises due to serious economic and political problems that policy-makers have little or no ability to change. Hyperinflation is a political phenomenon.

The extreme political difficulties which spur hyperinflation might involve a civil war, after losing a war with other countries, or due to some kind of natural disaster. The U.S. hasn't seen a true hyperinflation since the Civil War of the 1860s – and it was the losing side (the Confederacy) which suffered much more from this disease (attaining 1,575 percent in May 1865). In the U.S., the severe inflation at the end of the 1970s (13.5 percent in 1980) was hardly in the same league as hyperinflation. In fact, it is small potatoes compared to that during World War I (18 percent in 1918) or the Civil War (almost 25 percent from 1862 to 1863 in the North).

More specifically, hyperinflation is most likely when the government is having severe financial problems or falls apart completely. Extreme political difficulties mean it has a very large budget deficit that it can't get rid of fast enough: it can't cut spending, raise taxes, or even get people to pay existing taxes. (If it's fighting a civil war, it doesn't want to cut the military and has a hard time raising taxes on those whose loyalty is in doubt.) Having this kind of uncurable budget deficit means that nobody will lend to it (or buy its bonds, such as T-notes). Given this mess, the only way to pay for the government's operations is to "run the printing presses" (by pushing the central bank to create tremendous amounts of paper money). Finally, of course, government-backed money stops being scarce so that its price – its purchasing power – disappears.

5. Inflation's Impact. Putting the disaster of hyperinflation aside, why do we care about inflation? When people are upset with inflation, it's usually because their paychecks aren't keeping

[9] This ignores the fact that central bankers are almost always opposed to inflation of any kind and have to be pushed by political forces to move away from the low-inflation rule (as happens during wars, for example).

up with grocery bills, the rent, car payments, etc. On average, the amount of money the boss pays them isn't increasing as much as the CPI. They're losing the upward race between wages and prices.[10] The price of widgets is too damn high!

Suppose that in year A, the average wage paid to workers was $10 per hour – and that this money wage rises to $10.60 per hour in year B. At first glance, it seems that workers received a six percent raise between the two years. But these numbers don't say anything at all about how much employers (as a group) have raised the prices of consumer goods and services during this period: any price hikes reduce the purchasing power of the $10.60.

Using the inflation numbers above, money wages rise more slowly than the fall of the purchasing power of a dollar: workers receive more money, but each dollar of that pay can purchase fewer widgets. Because the price of a widget was $1 in year A, the $10 wage could buy 10 widgets. But each dollar in year B's $10.60 paycheck could buy only about nine tenth of a widget. Thus, the total number of widgets that the wage in year B can buy is about nine tenths of 10.60 (which is about 9.63 widgets). This was a fall of about four percent. To keep up with inflation, workers need to have their money wages rise by 10 percent: with a raise to $11, this money would have been able to buy about 10 widgets in year B.

Economists contrast money wages (the numbers on the actual paycheck, in dollars and cents,) with inflation-corrected or real wages (in purchasing power terms).[11] These wages are strongly connected to the standard of living of working people. Real wages are often called constant-price wages (or wages measured in "constant dollars"). Instead of describing the purchasing power of a single dollar, real wages measure the purchasing power of the total amount of money paid per hour (or per week or whatever): it's *the ratio between the money wage and the CPI*. In our story, it's the number of widgets the paycheck can buy.

Return to the example above. In year A, the average worker received $10 but widgets sold for $1 each, the worker could buy $10/$1, which equals 10 widgets. Then, in year B, the average wage was $10.60 in terms of money. Since each widget sold for $1.10, the average worker could buy only $10.60/$1.10 or about 9.63 widgets. In real or purchasing-power terms, workers in this example suffered from a wage cut.

[10] Note that this differs from the race between what they produce (labor productivity) and what they're paid. Over longer periods, this latter race is more important. We're also ignoring the role of income and payroll taxes.

[11] Either can be before or after taxes.

This fits with recent real-world experience: going from December 2020 to December 2021, the average real hourly wage for all employees on private nonfarm payrolls fell about 2.6 percent. Over the same time span, average real weekly wages fell by about 2.3 percent.[12] Of course, type of fall does not always occur: real wages can rise if unions and other pro-worker organizations are strong, pro-labor laws (such as a reasonable minimum wage) have been enacted, and/or labor is relatively scarce in many markets.[13] In short, it is possible for workers to win the race between money wages and prices.

Another impact of inflation is that it can help debtors. The "debtor class" includes most people these days! Suppose that you've signed a debt contract (such as a mortgage or student loan agreement) that makes you pay $10,000 each year in money terms. If this amount does not change, the purchasing power of these payments falls with inflation. In year A, the real payment equals $10,000/$1 or 10,000 widgets. Then, with the CPI rising to $1.1 per widget, it equals $10,000/$1.1 or 9,090.90 widgets.

The "real" value or the affordability of this debt obligation can be calculated in comparison to money income, so that it's a measure of the affordability of the debt payments. Suppose you work 3000 hours per year in both years A and B. So, in year A, your money income is 3000*$10, which equals $30,000. Then, your income is three times as large as your payment (as budgeting experts used to recommend). If your wage rises to $10.60, your income is $31,800/$10,000 or 3.18 times as large as your obligation. Your debt obligation has become more affordable.

Naturally, your creditors are losing: the dollars they're paid won't buy as many goods and services (or labor) as they did in the past. (The same is true for those who are receiving fixed incomes.) Thus, creditors don't like inflation – unless they can figure out how to raise mortgage payments in money terms (as with adjustable-rate mortgages or ARMs). The Fed, which typically acts as the government's policy-making arm in macroeconomics, most often reflects this point of view and has regularly engaged in anti-inflation campaigns.[14]

[12] See https://www.bls.gov/news.release/archives/realer_0112year B.htm.

[13] In the long term, real wages can rise with labor productivity. But this link has not been strong since the 1970s.

[14] Officially, the Fed is also supposed to promote employment. In practice, it seems to do so only when the banks are threatened with collapse (a financial crisis) and need funds to survive – or if the dreaded deflation is threatening to disrupt the economy. In my opinion, the Fed has been "captured" by the financial sector the way that the Civil Aeronautics Board (now abolished) had been captured by the airlines (and for similar reasons).

The decrease in real debt might compensate those whose money wages fall behind in the race with the rising price level. In the end, do you gain or lose due to inflation? In general, it's hard to say anything solid: you gain if your money wage rises faster than prices and if your real debt payments fall. This gain is more likely if the inflation is associated with high employment (low unemployment). In that situation, improved bargaining power may allow you to earn higher real wages. However, as in the rest of life, there is no guarantee.

6. The Fed. Briefly consider the aforementioned Fed and its role in allowing or fighting inflation. This organization was founded in 1913 in a response to a string of serious bank failures. From the start, it has opposed inflation, except when it's seen as an unavoidable cost, as during the World Wars. Since the Humphrey-Hawkins Act of 1978, aiding employment has been one of the Fed's official jobs. Actual anti-inflation policy is made by the Federal Open Market Committee (FMOC), whose membership reflects who was appointed as chair and as members of the Board of Governors by the President (and okayed by the Senate). After that, they are left to do what they want (within the law). But, as a government-sponsored agency, it often walks a tightrope: it must try to satisfy two groups that don't agree on everything, i.e., Congress and the President (its official bosses) and the banks and financiers (its natural allies).

Officially, the FMOC is supposed to promote both price stability (low inflation) and maximum sustainable employment. Unofficially (i.e., in practice), it also aims to preserve (or re-create) the stability of the financial system, along with promoting the morale and prosperity of the bankers and financiers. Note, however, that the FOMC does not have complete control of the economy. It is more able to fight inflation than to fight recessions: in practice, it is much easier to restrict lending and spending than it is to stimulate them.

Since 2000 or so, the FOMC has mostly used the interest rate on extremely short-term loans (the "fed funds rate") as a target as a way to state its goals to the public and to guide its monetary policy. In the case of "tight money," it raises that rate. Typically, this approach is applied when it wants to slow the economy to fight inflation. In the case of "easy money," it reduces it. Usually, it does this they want to stimulate the economy to fight serious recessions (and low employment) or financial crises. Either kind of policy works best when sustained, seen as long-lasting, rather than being reversed quickly. In recent news, the FOMC announced that it will follow a

persistently tight-money path to fight the Covid-driven inflation. Beyond that, space limitations mean that we must return to the main topic rather than trying to add any more details to this picture.

7. Changing Inflation Rates. Most people – including economists – see moderate inflation as a serious problem only if it lasts for more than a year or so. This was the case described above, where the inflation rate stayed constant into year C. But inflation would instead accelerate (get worse) if the year C price level equals $1.25 (instead of $1.21 as in the example above). The inflation rate equals almost 14 percent between years B and C. Back during the 1970s, we saw serious acceleration when large and persistent increases in oil prices shocked the U.S. economy. In recent years, most saw such problems as things of the past until inflationary acceleration hit from 2020 to 2022, due to the Covid pandemic plus the economic and political responses to it. The Russia/Ukraine war may be encouraging further acceleration.

At first glance, it seems that this new acceleration will continue. But if the repercussions of the Russia-Ukraine war do not overwhelm it, the current inflation might be a temporary "blip." In our numerical example, a blip of this sort can be seen in the obvious case where (after rising from $1 in year A to $1.1 in year B), the CPI stays equal to $1.1 in year C. With these numbers, the inflation rate from B to C equals zero: the surge from A to B was completely temporary. Leaving the imaginary numerical example, I can only imagine that President Biden would be very happy with this kind of result. As an intermediate case, suppose that the CPI rises from $1.1 in year B to $1.15 in C. That's an inflation rate of about 4.5 percent, substantially slower than between years A and B. Even without the CPI's rise coming to a complete halt, inflation slows or "decelerates." If the slowing of inflation occurs over several years, it's called disinflation. As seen below, this differs from deflation, though it can turn into that dreaded disease.

8. Demand-Side Inflation. We can see why disinflation might occur by first looking at the possible causes of inflation and changes in its rate. Initially ignore the "supply chain" problems of recent news. Then, since this primer isn't really about the causes of *all* inflation and its

acceleration or deceleration, I simply state a truism: inflation results from "too much spending chasing too few goods" or "too much demand colliding with a limited supply."[15]

The standard textbook describes this cliché using the Phillips Curve which describes *demand* inflation. (I promise not to draw it!) The story could go in either of two ways, i.e., expansion and contraction. Going the first way, quick growth of the demand for newly-produced goods and services (which could occur for whatever reason) directly pulls up the prices of many nonhuman resources used to produce them, such as oil and agricultural crops. This economic recovery (or "boom") also leads to the hiring of more workers needed to make the products. If fast enough, this demand growth rams against the economy's limited supplies of labor.[16] High employment (low unemployment) of labor causes higher money wages, because labor is relatively scarce in markets and workers' bargaining power is improved. The costs of labor and nonhuman resources are then passed along to consumers as higher product prices. In sum, there aren't enough resources so that "too few goods" can be produced to serve demand, stimulating inflation. The "price" of the rise of the employment of labor is increased inflation. Then, if the FOMC wants to prevent rising inflation, it should keep demand, production, and employment down.

Going the other way, falling or slow growth of spending pushes down the demand for goods and services and thus the employment of both labor and non-labor resources. With ample amounts of unemployed labor and supplies of nonhuman resources, money wages and other resource costs are pulled down (or stop rising as quickly as they had been doing in the past).[17] Workers' bargaining power falls. As these cost changes are passed on to consumers, the inflation rate declines. In this case, the "price" of decreased inflation is decreased employment. Further, if the FOMC does not like the fall in employment, it pays for it with higher inflation.

Several times since World War II, the FOMC produced this latter kind of result by raising interest rates: higher rates make borrowing more expensive, discouraging spending on factories, machines, houses, and other items that are paid for over several years. This fall in demand for products means laying off many workers who are required to create these things and depressing their wages. It also prevents attainment of what people think of as "full employment" (low

[15] The usual "too much money" that appears in this cliché leaves out other causes of too much demand for the product besides the amount of money available in the economy.

[16] "Employment" is almost synonymous with "the availability of jobs."

[17] Wages are typically pulled up or down relative to the trend. Unlike for non-human resources, a "cut" is usually not an actual nominal wage cut.

unemployment) despite the benefits that may result (such as reducing poverty and income inequality). The extreme case of this kind of policy was the "war against inflation" (see below).

Students who have studied economics have likely heard that "the Phillips Curve is dead!" It is true that the actual experience during the 1970s shocked economists who used the Phillips Curve (PC) in economic analysis and policy. (It was un-PC!) However, it goes much too far to say that the PC is totally irrelevant or obsolete. Rather, that kind of demand-side inflation has been *demoted*. It is only one part of the story so that it's a mistake to focus on demand inflation alone. The other main types of inflation also play a role: these are Supply and Hangover inflation.[18]

9. Supply-Side Inflation. Returning to the first part of the PC story, President Biden's economists predicted rising employment and output due to a combination of his programs, the FOMC's easy money policies, and the recovery of the private sector. Their understanding of the PC implied that this expansion would raise the inflation rate in a limited and acceptable way. But more inflation resulted than predicted! The recovering economy had hit supply barriers which that increased the inflation that the PC story predicts. It's akin to what happens if you're climbing a hill and then the path becomes steeper: it is more difficult (costly) to climb higher and to attain the summit (your goal) than predicted. Having faster growth of demand (and employment and output) means more increases of inflation than had been experienced in the past.

Such supply shocks usually results from unexpected declines in the economy's ability to supply, so that it suddenly has "too few goods" (relative to demand).[19] There are two subtypes. First, the U.S. saw "oil shocks" during 1970s, which spawned not only economic ugliness, but an especially ugly word: stagflation. This word is a portmanteau combining two pieces, stag and flation. Here, "flation" refers to accelerating in*flation* and "stag" refers to *stag*nation (slowing and/or falling availability of jobs). Wars in the Middle East (where so much of the world's oil is drilled) spawned stagflation when they caused cut-backs in oil supplies and thus sudden and persistent

[18] The idea that there are three kinds of inflation is old, perhaps going as far back as a popular article by James Tobin in 1974. See his There Are Three Types of Inflation.

[19] Supply shocks *shift* the PC or change its slope. A bad supply shock (of the first subtype) means that for any given growth rate of demand, employment, and output, there is a higher inflation rate than it would before the shock (a PC shift). An increased role of bottlenecks (the second subtype) makes the PC steeper: an increase in the growth rate of demand has a larger impact of raising the inflation than a similar increase in the growth rate in the past.

increases in the price of oil, other energy products, and petrochemicals (such as fertilizer). The last encouraged soaring food prices.[20]

2021-22 saw an example of the second subtype: an extra dose of inflation arose due to problems with the *distribution* of resources and products: bottlenecks in world-wide supply chains meant that "too few goods" could be delivered to customers despite the world having sufficient resources available to produce them. (See box #1.) Biden's economists now likely see this problem – but as only temporary. Until recently, they relied on the expected end of these bottlenecks to quiet the inflationary fires.

Box #1: Bottlenecks.[21] Back in March year 2020, a huge freighter (the *Ever Given*) turned sideways and blocked the Suez Canal. The slowed shipping and made many products more costly around the world, adding to the already-existing inflation. After the ship was dislodged, most or even all of this extra inflation disappeared. The source of the current inflationary surge resulted from having something a lot like having many, many small ships stuck in many small canals. When the demand for products and for the labor to produce them increased in 2021, many employers had a hard time finding workers, primarily due to Covid, the lock-downs, and a wave of early retirements. (Firms could have paid higher wages to attract workers – but saw this as unprofitable.) This caused snags in the supply chains stretching across many different countries: corporations limited production, reducing not only the supply of goods and services for consumers but that of needed raw materials sold to other firms.

In a simple story, shortages in the production of cotton limited production of and supply by the thread producers – which in turn meant empty shelves and racks in clothing stores (and/or rising prices). Worse, companies began to hoard inventories (of cotton, thread, etc.) because they wanted inventories to serve expected demand for their products. This made it even harder for the thread and clothing producers to keep up with demand. The resulting chain reaction – the so-called "bullwhip effect" – makes matters worse for those companies needing these inputs. This tightens the bottlenecks and amplifies any initial increase in inflation. Making things worse is the fact that, in recent decades, firms have become increasingly dependent on – and used to – getting inputs to production "just in time" when required. So, when ordered inputs show up late, it is more costly than before this strategy became common. Of course, these costs are passed on to buyers and/or lead to further shortages.

[20] The 1973-74 shock resulted from a war between Israel and its neighbors while the 1979-80 shock was due to the war between Iran and Iraq (which was a U.S. ally at the time). These hit the U.S. economy at a time when it was very dependent on the use of oil.

[21] The word bottleneck describes the case where you turn an open beer bottle (with a narrow neck) top down and "chug-a-lug."

Stagflation poses a difficult problem for the FOMC. If only demand (PC) inflation exists and it aims to reduce the inflation rate, they can do it by raising interest rates, so that output and employment fall. That's obviously painful for working people, but the FOMC often sees the costs of inflation as more serious. Alternatively, it could ignore the current inflation and avoid a recession. This second approach fits the bill well when financial crises hit, as in 2001, 2008 and 2020. These choices represent a trade-off: reducing inflation is purchased by losing jobs, while allowing more job creation is purchased by suffering from a higher inflation rate.

But with supply shocks, the FOMC has no choice but to choose between two evils (the Devil and the deep blue sea) – or accept a combination of the two. To the FMOC, the deep blue sea (usually their preferred option) typically involves a recession, increasing joblessness. In extreme cases, this approach might also spur a financial crisis (as in 1981-2).[22] Alas, unlike in the PC case (where the inflation rate falls), a recession only prevents *additional* inflation from occurring; it does not subtract from existing inflation. In contrast, the Devil avoids a recession but allows the shock to add to the existing inflation. (With the PC, the inflation rate won't change unless there's a recession, except by accident.) During the 1970s, the FOMC chose a combination of these: relatively mild recessions dulled the inflationary impact of the supply shocks rather than totally preventing accelerating inflation. But these recessions could be painful, making it harder for workers to raise money wages in step with soaring inflation (in addition to other costs).

The stagflationary era was ended by the war against inflation starting in 1979 when President Carter appointed Paul Volcker to head the Fed and the FOMC. The FMOC decided, it seems, to ignore the costs of a recession. In the aftermath of this "war on inflation," U.S. inflation rates have been low.[23] (Since 2000, the rate has usually been below 2 percent per year.) But despite this "victory," we should not believe that stagflation is totally defeated: as I write, the Russia-Ukraine war may spark a serious supply shock that causes it to reappear.

The dilemma with the second subcase (bottlenecks) is different. First, though the inflation rate has soared during the last two years, jobs have become more available as the economy recovered somewhat from the Covid recession that started in 2020. Though I can't read his mind, it's likely that Biden hopes that inflation will die down at the same time that the availability of jobs

[22] This financial crisis primarily occurred in Latin America.

[23] Note that the low inflation was associated with slowing GDP growth (compared to the 1970s), financial crises, and, after 2000, falling employment ratios.

continues to increase (or at least doesn't fall). How could this happen? Many see the process as almost automatic: businesses will catch up with preexisting orders soon, unfreezing supply chains: the flow of goods from cotton to thread to clothing will speed up (until it's normal) and retail shortages will end. If so, disinflation would eventually occur, making the inflation rate more like that seen before the Covid recession. The actual deceleration that results may not as much as Biden wants, but it's an improvement. Note that if the current bottlenecks go away quickly, monetary policy does not to be as tight as if they persist (or even fester). If so, the FOMC does not have to raise interest rates much and does not have to induce a serious recession (and serious damage) to keep inflation moderate.

10. Hangover Inflation. One of the reasons why economists (including those at the FOMC) fear inflation is that if it persists at a significantly higher rate than in the past, it can become the "new normal." Unlike the first two types of inflation, this kind is *built into the economy's regular workings*. The "new normal" scenario may be unlikely, but it could happen. Even if it is not created, the nature of hangover inflation means that there's a very slim chance that disinflation will cut the inflation rate to zero.

Why is the feared inflationary "normal" unlikely? Before addressing that question, we must address the question of why inflation unlikely to come to a screeching halt (i.e., attain an inflation rate of zero). The answer is that the inflationary process has some momentum, meaning that it often continues despite significantly falling or persistently stagnant demand, production, and employment. This is an inflationary hangover due to past inflation: if inflation persisted in the past, it's hard to get rid of now. (If you over-indulge on Saturday night, you feel the results on Sunday!) Of course, the solution is to avoid such intemperance in the first place: the FOMC sees itself as trying to avoid the development of a hangover (or its getting worse). Crucially, this inflation does not start itself: instead, it's big demand or supply inflation that starts the ball rolling.

One reason for this preventative approach is that once hangover inflation exists, FOMC anti-inflation campaigns are more difficult. The more deeply-rooted hangover inflation is in the economy, the more that cut-backs in demand have to be large and/or long-lasting to reduce the inflation rate. In more down to earth terms, the harder it is to stop inflation's momentum, the more a steep recession (with plummeting employment) and/or a persistent one (with employment held low for several years) is needed.

Textbooks and journalists point to inflationary expectations (guesses about future inflation) to explain the hangover. This view centers on the possibility of a self-fulfilling prophecy: just as happens regularly in speculative markets (such as the stock market), sometimes prices rise because people expect them to rise. Starting the process, if workers expect inflation, they push for higher money wages (to protect their real wages). If bosses expect inflation, they will raise prices whether money wages are rising or not – or are more willing to accept higher money wages. If the resulting inflation is fast enough, people see their expectations as accurate. Thus, they stay the course, continuing to expect inflation and to act on those expectations.

This story makes some sense. But it's incomplete and thus doesn't fit well with real-world experience. When Volcker's FOMC launched its war against in inflation in 1979, some economists used this theory to predict that the resulting recession and job loss would end very quickly. This was attractive because squeezing inflation out of the system would be close to painless (with relatively high employment, etc.) It turned out to be far from that easy. Low demand persisted, so that employment fell drastically and stayed low. The key collateral damage was that many well-paid jobs and whole swathes of the economy were destroyed.[24] Front and center was the destruction of the U.S. "Industrial Heartland" (the center of unionized jobs and much middle-class prosperity in earlier decades) and its transformation into the dismal, depressed, and non-union "Rust Belt."[25] In many ways, this marked the end of the widely-distributed prosperity after World War II prosperity in the U.S. and the beginning of what's often called the "neoliberal" era.[26]

The problem is that the story of the self-fulfilling prophecy is incomplete at best: the vast majority of people lack the ability (or power) to raise their money wage in response to what they expect to happen in the uncertain future. Suppose that you expect 10 percent inflation during next year and, naturally enough, you want to keep your real wage from falling. So, you ask your boss for a 10 percent raise.[27] Gales of laughter will likely result, along with doubts about your loyalty to the firm. Nowadays, only the most elite employees can dictate the raises they get. This

[24] Part of this story was a high foreign exchange rate, which made U.S. products expensive to those owning other currencies while making their products less expensive for those owning U.S. dollars. In addition, any serious recession hurts profits. The Reagan tax cuts helped fight this effect.

[25] It may be that attaining this was one of the Fed's goals all along – or that Volcker *et al.* simply didn't care.

[26] Neoliberalism has been defined as combining 19th century *laissez-faire* with the government creation of artificial markets. On a world scale, in my view, the neoliberal era started on September 11, 1973.

[27] One problem is that many of your fellow employees may not agree with your expectations.

powerlessness describes the situation which most production workers in the U.S. have faced since the 1980s, during which real wages also stagnated (relative to what labor produces).

Also, many businesses cannot simply raise prices when they want to: whether or not they can do it depends on how much competition they face. It's true that most industries in the U.S. are far from being totally (or "perfectly") competitive, but no monopoly is perfect. Firms still have to worry about the limits imposed by foreign competition.

Understanding hangover inflation thus requires bringing in the role of market power. This is the ability that some firms have to raise prices (by artificially reducing their supply) and of some of some workers to raise wages. Given this, a better theory of the persistence of inflation involves the price/wage spiral, which was seen during the 1950s and 1960s in many sectors. First, because workers fear inflation, they push for higher money wages. They are most likely to succeed if they have labor unions, collective bargaining rights, and some insulation from competition (or some type of inside advantage of the sort that top executives have), especially when the demand for labor is high. In addition to trying to insure wages against inflation, they push for higher money wages to make up for past real losses. In addition, a lot of imitation or emulation goes on: the police union wants raises because the sanitation workers got them, etc.

Then, if workers win higher money wages, their employers raise prices, passing the cost onto consumers. This validates workers' fears so they may still expect prices to grow faster than their money wages. In the end, "wages chase prices" and "prices chase wages" so that the economy looks like a kitten chasing its tail. In addition, managers may find that cutting their employees money wages can cause a fall in morale, which usually hurts their workers' productivity. But inflation helps them solve this problem: rising prices mean that workers receive a "real" pay-cut even though the boss isn't demanding a money pay cut. In sum, this is sometimes described by saying that "inflation greases the wheels of labor relations." (See also box #2.)

Note that some of the price/wage spiral may occur without any kind of strike or lock-out – or even regular negotiation: the "wages chase prices" element of the process may be cost of living adjustment (COLA) seen in some labor contracts. Some employees without unions have had these.[28] If you have one, your money wage rises automatically with the rate based on the previous year's inflation. It was extremely rare that real-world COLAs completely protected wages

[28] Social security benefits have a COLA, so that they rise following last year's inflation.

protected against inflation, but the existence of these contracts does add some momentum to the inflation process because current money-wage hikes are partly based on last year's inflation.

> **Box #2: Other Factors behind the Hangover.** Matters outside normal labor-management negotiations and the price/wage spiral also strengthen the hangover by helping the normal operations of the economy. One fact of life of business is that prices typically rise more easily than they fall, mostly because wages stated in money terms don't fall quickly; in this case, any price cuts lead to profit cuts. In a pure case where prices don't fall at all, suppose the demand for farm goods rises as that for manufacturing goods falls. In this case, farm prices rise – but manufacturing price do not fall. So, on average, prices rise. Further, this makes the agricultural input costs of manufacturing rise – and may put an upward pressure on wages (as workers find their real wages falling). If, as usual, these costs are passed on to consumers, an inflationary hangover results from the constant shifting of demand between sectors.

In addition to the hangover, FOMC policy itself makes it unlikely that we'll see inflation rate falling to zero. Since the year 2000, it has aimed to have an inflation rate significantly above zero; officially, this target was two (or even three) percent per year.[29] This may be due to the kind of inflationary hangover sketched above – and the FOMC's wish to allow normal commerce to progress by "greasing" its wheels. But a more important reason for the reluctance to reduce inflation to zero is fear that the inflation rate could get *too low*, which could turn into disastrous deflation (see below). In any event, the FOMC policy of targeting a two percent inflation rate encourages people to expect that inflation, reinforcing the other elements of the hangover.

All of the discussion above implies not only that zero inflation is unlikely but that the current "Covid-driven" inflation might become the new normal. However, important changes in the structure of the U.S. economy suggest that the latter is improbable. Things have changed dramatically since 1980 or so: it is unlikely that the experience of the 1950s, 1960s, and Volcker's war fits with the current era. This is largely because that war itself transformed the economic landscape, making the story of hangover inflation above seem a bit archaic. In our neoliberal (or free-market) era, both labor unions and COLAs have become much less prevalent.[30] In addition, taking international competition into account, some say that the U.S. economy has become less

[29] Until the Covid crisis, the actual inflation rate was below 2 percent, suggesting that the Fed was biased toward inflation being below its official target.

[30] Unionization rates have fallen by about half since 1983 (see unionization). The fall of the unionization rate for public-sector workers has been much more moderate. The prevalence of COLAs also dropped during this period (see Cost-of-living Clauses).

monopolistic since the 1960s, in that many firms have less power to raise prices.[31] If this is accurate, these changes mean that the relative importance of inflationary expectation in causing the hangover has increased. Then, since inflationary expectations can change quickly, the FOMC's fight against inflation may have fewer direct costs of the sort encountered 40 or 50 years ago.

All of this implies that, if we can ignore the possibility of financial crises, the FOMC has more power to attain its desired inflation rate by encouraging low inflationary expectations. To convince us to have low inflationary expectations, that is, all the FOMC has to do is to convince us that it's seriously committed to keeping the inflation rate down and that its efforts are credible. Paradoxically, such ease in fighting inflation can be disastrous if it leads to deflation.

11. Deflation. Negative inflation or deflation refers to a situation when the average price falls over several years. Though this may sound good at first, it's very different from having the price of gasoline, groceries, or gas-guzzlers alone falling. Each of those declines is very nice for consumers, but if all three of them fall – along with most other products – the effects can quite serious: economists consider it to be significantly worse than moderate inflation or even the stagflation we saw in the 1970s. This is the important reason why the FOMC (under chairs Greenspan and Bernanke) worked actively to prevent deflation during the two recessions before the Covid-driven one: they feared that we might see the kind of results seen in the period 1929 to 1930s.

First, why is deflation possible? As suggested above, workers' power to raise wages and even employers' power to raise prices have faded, making hangover inflation less of a problem. That means that changes in demand and employment have a larger impact on the inflation rate during a given year than during the "golden age" of the inflationary hangover (the 1950s and 1960s). This goes either way: the inflation rate can relatively easily soar or decline due to changes in demand. Remember, however, the FOMC is better at restricting inflation than ending deflation.[32]

In addition, actual deflation is made more likely by the trend toward some large firms having more monopsony power.[33] That is seen in the rise of companies such as Amazon and Wal-Mart do (which also have monopoly or price-setting power). Even though some authors call this

[31] Even if this trend exists, it may be reversed, as firms' executives are always figuring out how to avoid competition. At the same time, firms keep merging with each other.

[32] The central bank of Japan has had severe problems in their efforts to fight deflation there.

[33] On the role of monopsony, see Monopsony, an article in VOX Monopsony 2, and Barry Lynn's article in Harper's Magazine (July 2006). (Lynn refers to monopsony as "monopoly.")

"monopoly," that "psony" at the end is important because it clarifies thinking.[34] As in textbooks, a monopolist has the ability to artificially limit its production and sales in order to push prices upward and maximize its profits. Similarly, a firm with monopsony power can go beyond what "normal" firms can do. While normal firms have the ability to pick and choose among workers (deciding which ones to hire, fire, etc.), the monopsonist can artificially restrict the *total* number of workers hired. This depresses not only employment but wages. Similarly, the monopsonist has a lot of bargaining power with suppliers of other inputs (wholesale items) – and can thus drive the prices that wholesalers can charge down. The resulting low costs allow monopsonists to charge low prices for their products, encouraging a deflationary trend. Worse, these low prices can drive the competition out of business – or at least hobble them, making them dependent on the monopsonist's willingness to demand their products or supply them with inputs. To some extent, people driven out of business by the monopsonist then have little choice but to find jobs with similar companies: this fits the familiar image of the Walmart "greeter" who had once been a skilled worker at a hardware store or even owned it.

Since they counteract the ability of the monopsonist to reduce wages (and thus the impact of monopsony power), if organizations such as labor unions or laws such as the minimum wage are weakened, that spurs not only the steady disinflation and but even the emergence of deflation. Of course, this kind of undermining is a key element defining the neoliberal era. Thus, if the FOMC cannot prevent deflation, it can occur. In fact, the 1920s – a free-market period much like ours in many ways – was followed by massive deflation in the early 1930s.

But why would such deflation contribute to the depth of the Depression that lasted until World War II started?[35] To understand this kind of *impact* of deflation, examine what it may mean to you personally. Supposing that your money wage equals $10 per hour and does not change. To represent deflation, assume that the CPI starts in year A with the price equal to $1 per widget and then falls by 10 percent between years A and B. In this case, the purchasing power of your money wage payment *rises*. In year A, your real payment equals $10/$1 or 10 widgets. Then, with the CPI falling to $0.9 per widget, the payment equals $10/$0.9 or about 11.11 widgets. Surprisingly, you are actually gaining from deflation! This conclusion applies as long as the

[34] The word "monopoly" translates as "single seller," while "monopsony" is single buyer. Economists often use the word "monopoly" to refer to price-setting power and "monopsony" to refer to the ability to set input prices.

[35] Note that the deflation of 1929-33 was hardly the only factor contributing to the depth of the Depression.

money wage rises or falls less than 10 percent per year. (My grandparents had this experience after 1929. Luckily, their income didn't fall very much.)

A consumer can gain from deflation, but debtors typically lose. Since deflation is associated with low levels of employment, your money wage is likely to fall even if your real wage is rising. This, in turn, is relevant to your status as a debtor. Suppose that your money wage falls by 6 percent (from $10 to $9.4 per hour). Again, assume that you signed a debt contract that makes you pay $10,0000 each year in money terms, where the amount does not change. (Any kind of expense that's fixed in money terms could substitute here.) Then, as above, suppose that you work 3,000 hours per year (and that this number doesn't change). As before, your wage income in year A is 3000*$10 = $30,000. Again, this is three times as large as your yearly wage income. Then, if the money wage rate falls to $9.4, your yearly wage income in year B is 3000*$9.5 or $28,500. This is a significantly smaller ratio of income to debt obligations ($28,500/$10,000 = 2.85). You have a harder time paying your debts! If this fall is large and persistent, it will drive you toward bankruptcy (as occurred for many debtors in the early 1930s).

Both falling ratios of income to debt obligation and bankruptcies encourage people to cut back on their demand for goods and services, which leads to not only price cuts but reductions of production and employment. (The assumption that everyone works the same number of hours per year is harder to maintain.) Of course, falling employment in turn encourages money wages to fall, which lowers the ratio and spurs further bankruptcies. Falling labor costs also make it easier to cut prices, so that deflation continues.

The actual fall of prices can then cause people to expect deflation, which makes it more likely that they'll cut back on spending – in hopes to get bargains later. This means that the demand for goods is reduced, hurting the profits of nonfinancial firms. Expected deflation also encourages businesses to cut money wages. In a simple case, falling prices help the creditors. But if bankruptcies are widespread enough, the creditors don't win since their debtors simply cannot live up to their obligations.

This process can become a gigantic vicious cycle of the sort that hit the U.S. economy in the early 1930s. Deflation encourage a financial squeeze which drive spending cuts which in turn cause low employment deflation. One job of the FOMC is to stop this cycle from starting in the first place.

Summary.

1. Inflation describes the rise of the average price of goods and services available on the market in a large part of the economy (usually either for the whole thing or for all consumer goods).

2. The purchasing power of money measures how many marketed goods and services a unit of money can buy. It falls as the average price rises.

3. The rate of inflation is the percentage increase of the average price level.

4. Hyperinflation refers to an extreme case where prices are doubling during a short period. It is usually seen when a government loses a war or a civil war (or if there is a large disaster).

5. Inflation hurts workers' real wages and living standards if their wages lose in the "race" with price rises but helps if their debts lose value due to inflation.

6. The Federal Reserve is the central bank of the United States and its FOMC is typically the main macropolicy maker. In theory, it should fight inflation and promote employment, but in practice it is more complicated than that, especially since the Fed must deal with the results of financial crises.

7. If the inflation rate rises over two or more years, it is called inflationary acceleration. If it falls during that period, that is disinflation.

8. Demand-side or "Phillips Curve" inflation results from abundant growth of demand, employment, and production hitting limits of supply. It dissipates due to slow growth or stagnation.

9. There are two subtypes of supply-side inflation.

- **a.** The first occurs due to a sudden decrease in the ability to produces goods and services, usually occurring due to rising oil or food prices.
- **b.** The second results from bottlenecks that cause more inflation to occur than normally happens with the same rates of growth of demand, employment, and production.

10. There are two main elements of hangover inflation.

- **a.** The self-fulfilling prophecy of inflationary expectations: inflation occurs because people expect it to happen.
- **b.** The price-wage spiral and related factors that give the inflationary process momentum, so that to some extent it continues at the same rate despite changes in demand and employment.

11. Deflation refers to persistence of a negative inflation rate. It can be a disaster for working people as their debts gain purchasing power and real wages are depressed by low employment.