What's Inflation and How Do We Measure It?

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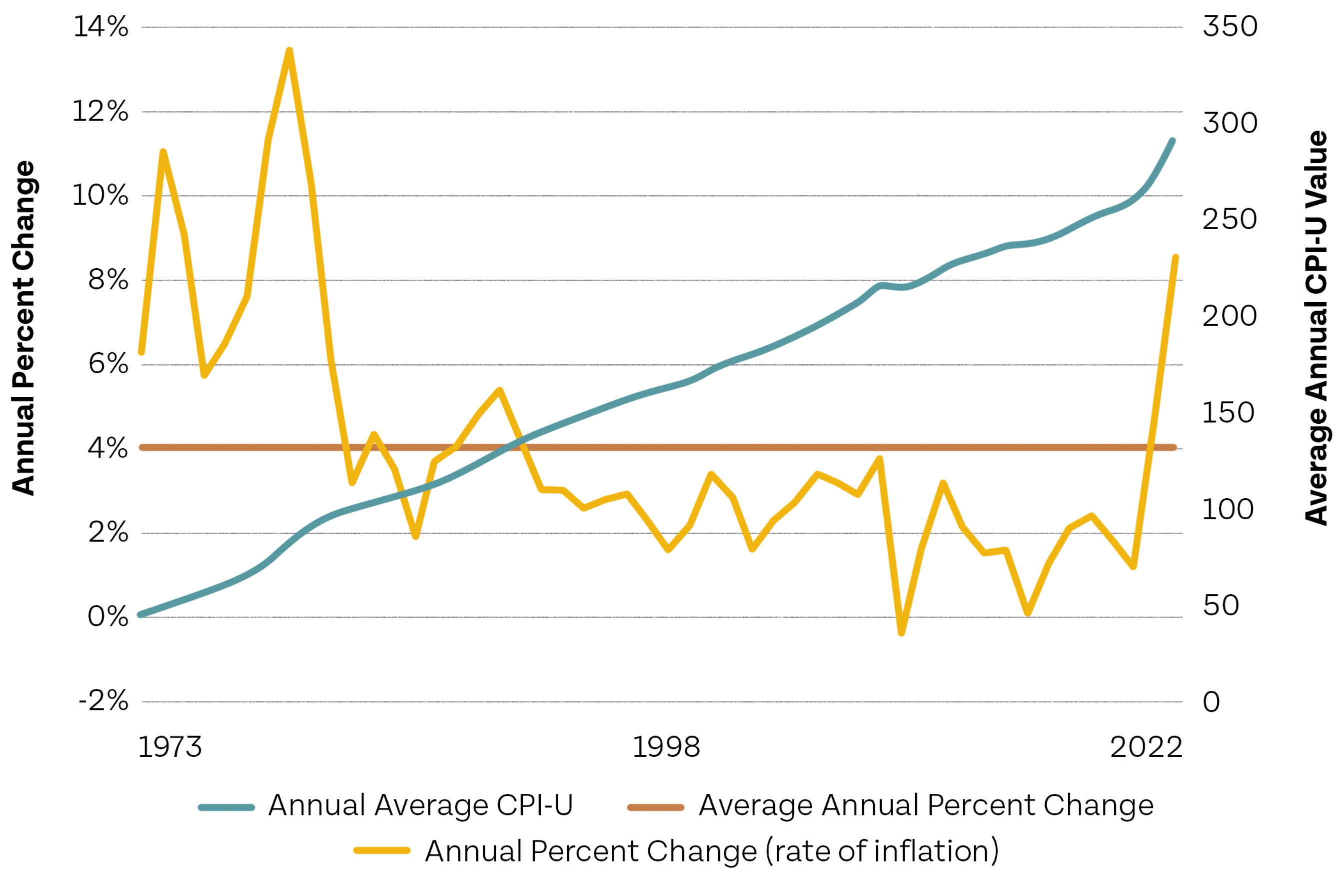
After decades of modest inflation, the United States' economy experienced rapid price growth beginning in 2021. The causes of the rise in inflation are numerous, ranging from loose fiscal and monetary policy to supply chain issues and war to post-pandemic consumer spending and a tight labor market. Regardless of the causes of inflation, consumer budgets face stress from the resulting higher costs. However, before delving further into its impacts, it's important to understand what inflation is and how it's measured.

Definition and Meaning of Inflation

Inflation refers to the increase in prices for goods and services over time. Such increases in price devalue the dollars with which we pay for those (now more expensive) goods and services. The old saying "a dollar isn't what it used to be" captures the fact that a dollar today has less purchasing power, the ability to buy goods and services, than it did in the past due to inflation. The rate of inflation varies over time based on an array of economic factors. As seen in figure 1, the last half century in the United States experienced annual rates of inflation ranging from -0.4% (a reduction in prices, or minor deflation) in 2009 to 13.5% in 1980, while averaging 4%. The recent uptick in inflation appears especially dramatic when compared to the period beginning in 1991, which represents the lived experience of a large share of the population. The figure also shows the average annual values for the Consumer Price Index for All Urban Consumers (CPI-U), which tracks inflation (the next section details how inflation is measured).

Figure 1: **50 Years of Annual Inflation Rates and Average CPI-U Values, 1973-2022**



Note: The 2022 estimated values are based on the CPI change from 2021 quarter one to 2022 quarter one.
Source: Federal Reserve Bank of Minneapolis. (n.d.). "Consumer Price Index, 1913-",
Accessed at: https://www.minneapolisfed.org/about-us/monetary-policy/inflation-calculator/consumer-price-index-1913-

To determine whether the public understands inflation, the Federal Reserve Board presents the following scenario and question in the Survey of Household Economics and Decisionmaking (SHED):

> ***Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account?***

In the 2021 survey responses, nearly 74% of respondents correctly answered that they would be able to buy "less than today" due to the rate of inflation exceeding the interest rate paid on the savings account. The remaining respondents answered in ways that suggest inflation remains a confusing subject for more than a quarter of the population.

In periods of low inflation, price increases often go unnoticed, especially if wages and investment returns keep pace. Yet the cumulative effect of years of even modest inflation result in meaningful price increases in nominal terms. And such inflationary pressures mean that a household can maintain stable income and still fall short of the resources needed to continue providing the same quality of life previously afforded. As a minor example, according to the National Association of Theatre Owners, the average movie ticket price climbed from $5.39 in the year 2000 to $9.16 in the year 2019.[1] The 70% increase in ticket prices over 20 years illustrates how inflation results in the same amount of money having less purchasing power over time, especially to the extent incomes increase at a relatively slower rate.

While it is fairly straightforward to determine the price change of a single good or service (by finding the percent change in price over a specific time period holding the quantity and quality of the good or service constant), most discussions of inflation consider broader economy-wide changes in prices over time. How inflation is measured matters for understanding the impact of inflation on different households.

Measuring Inflation

A variety of indices capture month-to-month and year-to-year price changes and serve as the basis for measuring inflation in the economy. While focused indices exist to measure changes in everything from producer prices to construction costs, the goal is to create an index that reflects the typical price changes experienced by select groups over a period of time. Most attention, though, falls on indices tracking price changes affecting consumers. But discussions of inflation, especially in the news, quickly become complicated by a focus on different price indices, discussion of "headline" or "core" numbers, and even regional variations.

The most commonly used index for measuring consumer inflation in the United States is the Consumer Price Index (CPI), produced by the Bureau of Labor Statistics. The venerable CPI, launched more than a hundred years ago, tracks the weighted prices of a typical basket of goods and services for an urban consumer over time and can be differentiated at the national, regional (Census Regions or Census Divisions), or metro areas (over twenty core based statistical areas, including Denver-Aurora-Lakewood, Colorado). More specifically, the CPI for All Urban Consumers (CPI-U) reflects prices experienced by roughly 93 percent of the U.S. population.[2]

Alternative CPI measures exist, including the more focused CPI for Urban Wage Earners and Clerical Workers (CPI-W), as well as the Chained Consumer Price Index for All Urban Consumers (C-CPI-U) which accounts for consumers' consumption changes as the relative prices of different goods and services change. Given that people's purchasing patterns change over time, the composition of the CPI's basket of goods and services periodically adjusts based on the Consumer Expenditure Survey.[3]

While the CPI is critical to understanding the inflation experienced by consumers, the practical importance of the measure cannot be overstated. Inflation measurements directly affect many sources of income, benefits programs, retirement contribution limits, and even income tax brackets:

> ***Many workers are covered by collective bargaining agreements which tie wages to the CPI. The index affects the income of almost 80 million people as a result of statutory action: 47.8 million Social Security beneficiaries, about 4.1 million military and Federal Civil Service retirees and survivors, and about 22.4 million food stamp recipients. Changes in the CPI also affect the cost of lunches for the 26.7 million children who eat lunch at school. Some private firms and individuals use the CPI to keep rents, royalties, alimony payments and child support payments in line with changing prices. Since 1985, the CPI has been used to adjust the Federal income tax structure to prevent inflation-induced increases in taxes.***[4]

Critics argue that a number of challenges undermine the accuracy of the CPI and similar price indices. First, the CPI reflects a finite basket of goods and services that may not be representative of consumer spending. Second, consumers naturally substitute one good or service for another as relative prices change and the CPI fails to adjust with the same responsiveness. Third, the quality of goods and services changes over time (especially related to improvements in technology) but is difficult to adequately capture in price indices. A more recent alternative to measure inflation is the Personal Consumption Expenditures Price Index (PCE) from the Bureau of Economic Analysis (BEA), which begins to address some of these challenges found with the CPI. Favored by the Federal Open Market Committee (FOMC) for informing monetary policy decisions, the PCE reflects a more expansive selection of goods and services and adjusts more quickly to changes in the composition of spending than the CPI.[3]

Much attention is directed to either the "headline" or "core" inflation numbers. Headline inflation refers to the commonly reported, usually year-over-year, percentage change in the overall CPI or PCE indices. Included in the headline inflation rate are consumer items, like food and energy, which often experience erratic price changes. While imperfect, the core inflation measure intends to limit the influence of these more volatile items and focus on the broader underlying inflation by removing food and energy components from the headline numbers.[4]

As demonstrated above, inflation is a complicated concept, which can be measured in a variety of ways. Recognizing these nuances is a pivotal first step to understanding inflation's impacts on individuals, families, and governments.

Endnotes

1 For more details, see: https://www.natoonline.org/data/ticket-price/

2 Bureau of Labor Statistics. "Consumer Price Indexes Overview," August 19, 2022. Accessed at: https://www.bls.gov/cpi/overview.htm

3 James Bullard. "Making Sense of Inflation Measures," September 8, 2022. Accessed at: https://www.stlouisfed.org/publications/regional-economist/2022/sep/making-sense-inflation-measures

4 Bureau of Labor Statistics. "Consumer Price Indexes Overview," August 19, 2022. Accessed at: https://www.bls.gov/cpi/overview.htm

5 James Bullard. "Making Sense of Inflation Measures," September 8, 2022. Accessed at: https://www.stlouisfed.org/publications/regional-economist/2022/sep/making-sense-inflation-measures

6 James Bullard. "Making Sense of Inflation Measures," September 8, 2022. Accessed at: https://www.stlouisfed.org/publications/regional-economist/2022/sep/making-sense-inflation-measures