

ECONOMIC COMMENTARY

The Long-Run Costs of Higher Inflation

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This *Economic Commentary* provides an overview of several frictions and the channels through which they affect economic welfare under elevated trend inflation above 2 percent. These frictions, associated with financial transactions, price and wage stickiness, and cognitive limitations, suggest that inflation imposes significant costs on society. Higher inflation may lead to a steeper Phillips curve, a situation which increases the volatility of inflation and interest rates.

Broadly speaking, inflation is defined as ongoing increases in the general prices of goods and services.¹ As part of its dual mandate, the Federal Reserve is tasked with maintaining price stability, a task which translates to keeping inflation low and stable over the long run.² As the Federal Reserve works to return inflation to its target rate of 2 percent, it is worth considering the costs associated with an elevated trend inflation rate, that is, a predictable, long-term inflation rate divorced from short-term fluctuations in individual prices, and the mechanisms through which these costs can proliferate.³ To consider how trend inflation imposes costs on society, picture first an idealized economy in which markets allocate resources without any frictions, which are imperfections within an economy that slow or distort responses to changes in market conditions. In a frictionless economy, prices respond immediately to events such as unforeseen changes in demand or supply or a predictable and constant rate of inflation. If inflation is predictable, firms and individuals will raise their prices and wages at a rate equal to inflation. Under these assumptions, prices and wages are perfectly indexed to the rate of inflation and do not burden the economy with additional costs.

And yet the US economy is not frictionless. Markets are subject to a range of frictions, linked, for instance, to technological constraints and social customs. These frictions typically cause elevated trend inflation to levy steep costs on society.

Overview: What Are the Mechanisms Leading to the Costs of Inflation?

We first offer an overview of some of the mechanisms through which trend inflation imposes costs. Except when otherwise stated, in this paper “inflation” refers to trend inflation.

Transaction frictions. Most market transactions involve payment and are usually accomplished in liquid assets such as cash. The presence of inflation distorts these kinds of transactions. To see why, notice that in the presence of inflation, the purchasing power of cash is eroded over time. Say, for example, that an individual can buy 10 lunches with \$100; then, a year later, under a 10 percent annual rate of inflation, the same individual can purchase only about nine lunches with the same \$100. In this scenario, in order to purchase the same number of lunches each year, the individual must hold 10 percent more cash year over year. Holding additional cash, however, subjects more of the individual’s wealth to erosion by inflation. All else being equal, this erosion reduces the individual’s purchasing power. On top of diminished purchasing power, the individual faces “shoe-leather costs,” that is, the time and effort spent optimizing the amount of cash held so that purchases can be completed while minimizing the amount of cash exposed to inflationary erosion through holding more cash (rather than, for example, investing it). Selling illiquid assets that hedge against inflation and transferring funds between financial accounts takes time and effort that could be used elsewhere.⁴

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Price stickiness. The act of updating prices on a website, on a menu, or in contracts requires effort on behalf of firms. The level of effort, what we will call “cost,” likely differs by firm. Gasoline stations with digital price signs and only several fuel types likely expend less effort updating prices than large supermarkets with thousands of individually priced goods that are updated manually. This cost suggests that for any level of predictable inflation, some prices—those that are easier to update—will update more frequently than others, generating relative price distortions. Firms that are facing a lower cost of updating prices gain an arbitrary advantage over firms facing a higher cost of updating prices, and consumers may change purchase decisions to align with the resultant distorted prices.

Wage and tax stickiness. Just as firms face costs when updating prices, employees and employers incur costs when inflation prompts them to negotiate wages more frequently. This cost reflects both the time taken to negotiate wages and the stress that negotiations produce. Conversely, it also may be that, even under elevated trend inflation, workplace norms discourage employees from discussing or requesting raises frequently. If wages are sticky, trend inflation will erode the purchasing power of wages between adjustments, leaving employees worse off.

Government spending, revenue, and regulations may also be sticky and fail to keep up with inflation. Certain taxes, such as capital gains taxes, are pegged to increases in an asset’s value and may increase as a result of elevated inflation. For example, since certain asset prices rise alongside inflation, individuals holding such assets will incur additional capital gains taxes even though the real value of the asset before taxes is the same. Individuals may alter their investments or consumption in response, creating additional distortions.

Financial frictions. Like frictions with prices and wages, imperfect financial markets can generate distortionary investments and transfers between individuals. Typically, people cannot account for all possible outcomes in financial contracts and must assume some amount of risk that cannot be insured against. This can create sticky financial contracts. For example, if an individual lends someone \$100 for one year without stipulating a level of interest above the prevailing inflation rate, the purchasing power of the interest earned on the loan will depend on what happens with inflation. If the annual inflation rate is 10 percent and if the individuals agree upon a 5 percent interest rate, then the individual issuing the loan lent the money at a loss. This is because \$100 spent at the beginning of the contract has the same purchasing power as \$110 spent at the end of the contract, but at a 5 percent interest rate, the contract leaves the lender with only \$105, a net loss in purchasing power. The example shows that trend inflation can effectively create a financial transfer from lenders to borrowers when frictions prevent interest rates from rising with inflation. Frictions may prevent interest rates from adjusting to higher trend inflation. The transfer includes the opportunity cost, or the value of other potential uses of the lent funds available to the lender, of lending to the borrower

plus the erosion of the value of the loan. Lenders unable to index contracts to inflation and facing such negative transfers will reduce lending below what is socially optimal.

Cognitive limitations. Comprehending inflation and its consequences is mentally taxing and stressful and may limit one’s ability to gather and process information needed to make sound decisions. As discussed earlier, elevated trend inflation brings shoe-leather costs and increases stress and time spent navigating distorted prices and investment returns and, in turn, could hinder financial decisionmaking. Higher levels of trend inflation may also require increased intervention by the central bank to anchor inflation expectations, a situation which would affect interest rates and, therefore, earnings. This would further incentivize people to spend yet more time and energy on their finances, leaving less of both for other pursuits.

Focus: Selected Mechanisms

Under elevated trend inflation, the frictions discussed previously pose potential consequences through multiple mechanisms. In this section, we discuss three of them: loss of purchasing power, capital misallocation and investment distortions, and the slope of the Phillips curve.

Loss of purchasing power. In the above discussion of wage stickiness, the purchasing power of wages erodes when frictions prevent them from adjusting at the same rate as rising prices.⁵ Individuals with sticky wages consume fewer goods and services as the general level of prices rises, a situation which reflects a direct loss to financial well-being. This loss is amplified when considering a subsequent drop in aggregate demand. As some individuals lower their spending, the would-be recipients of the forgone spending have a lower income, and they, in turn, reduce their spending. This pattern of reduced consumption ripples through the economy, producing an aggregate decline in welfare.

Capital misallocation and investment distortions. Under elevated trend inflation, financial frictions generate distortions in investment returns and in transfers between individuals. In sophisticated financial markets, these frictions make some asset classes better hedges against trend inflation than others. Real estate and stocks are prime examples. The price of real estate, especially residential housing, generally increases at the rate of inflation. This is true for several reasons. Because real estate requires numerous types of materials and services to maintain and construct, increases in other prices increase the price of real estate, both for new construction and existent structures. For stocks, however, the relationship is more complicated. Because stock prices reflect the present value of a company’s expected returns, lower profits reduce stock returns.⁶ Under elevated trend inflation, sticky prices reduce firm profitability because firms face costs for raising prices alongside inflation.⁷ Firms may also spend more time optimizing purchase decisions amid distorted prices, a task which also increases costs and lowers profits.

Overall, elevated trend inflation tends to favor increased returns in real estate and lower common stock returns, a situation which aligns with evidence in Fama and Schwert (1977).⁸ This distorted pattern of returns incentivizes the transfer of investment from stocks to real estate, with implications for macroeconomic efficiency. As investment shifts away from firms, the cost of raising capital for firms will increase, potentially generating further price increases and reducing wages. This also may reduce productivity if firms lack the funds to invest in research and development. Reduced productivity may lower economic growth over longer periods of time, and lower real wages may reduce output in the immediate term. Together, these two effects may generate losses throughout the economy that outweigh gains in real estate prices.

Slope of the Phillips curve. The Phillips curve, named after the economist A.W. Phillips, is a hypothesized inverse relationship between the inflation and unemployment rate. The theory holds that higher levels of inflation are associated with lower levels of unemployment in the short run (between one and five years). A low unemployment rate is typically evidence of a tight labor market in which employees have greater leverage in wage negotiations. Greater employee leverage leads to higher wages, a circumstance that often increases consumption and therefore prices. The slope of the Phillips curve refers to the change in the rate of inflation corresponding to a change in the unemployment rate. It depends on the flexibility of prices and wages in the economy: If prices and wages adjust quickly and frequently, small changes in the unemployment rate are associated with large changes in the rate of inflation if all else remains the same. Because elevated trend inflation requires that prices update more frequently and because individuals and firms would adapt to expect this, the slope of the Phillips curve increases with the rate of trend inflation.⁹

The Phillips curve can affect aggregate welfare in several ways. If the Phillips curve becomes steeper, short-term inflation, or nontrend inflation, becomes more volatile and requires more intervention by the central bank to stabilize, and this can amplify existing price distortions and distortions in asset class returns as the central bank changes interest rates to maintain the inflation rate. Increased short-term inflation volatility also increases the likelihood that the central bank will need to drop rates near zero. Encountering the zero lower bound is a binding constraint that leaves the bank unable to stimulate the economy by lowering interest rates further, and this bind can hinder economic recovery after a recession.

While more volatile short-term inflation makes encounters with the zero lower bound more likely as long as interest rates are able to adjust, the average interest rate will be greater with elevated trend inflation to compensate lenders for the erosion of purchasing power. If the interest rate is higher on average, then the central bank will have more room to adjust rates downward before achieving a near-zero rate, thereby decreasing the likelihood of an encounter with the zero lower bound.

A steeper Phillips curve also provides policymakers with improved feedback regarding the state of the economy. From 2015 to 2019, for example, there was substantial debate in the United States over how far the economy was from its maximum potential in terms of output and employment because of the small response of inflation to changes in the unemployment rate.¹⁰ Since the slope of the Phillips curve determines the sensitivity of this relationship, a higher trend inflation rate may provide policymakers with additional feedback.

The relevance of the above discussion, however, depends on a change in trend inflation's eliciting a substantive change in the slope of the Phillips curve. Although any change is likely to have some effect, there is evidence that the Phillips curve is relatively flat, so even a modest steepening may yield quantitatively irrelevant social welfare consequences.¹¹ Still, elevated trend inflation steepens the Phillips curve with potentially significant, but indeterminate, impacts on social welfare.

Conclusion

Everyday imperfections in the economy create frictions that generate substantial economic consequences under elevated levels of trend inflation. Although quantifying those consequences is beyond the scope of this *Economic Commentary*, we have detailed several potential channels through which elevated trend inflation may affect economic well-being.

Endnotes

1. For a more detailed definition, see the Federal Reserve Bank of Cleveland “What is Inflation?” available at <https://www.clevelandfed.org/center-for-inflation-research/inflation-101/what-is-inflation-start>.
2. For an overview of the dual mandate, see the Federal Reserve Bank of St. Louis “The Fed and the Dual Mandate” available at <https://www.stlouisfed.org/in-plain-english/the-fed-and-the-dual-mandate>.
3. In January of 2012, the Federal Open Market Committee (FOMC) announced an explicit inflation target of 2 percent. See the Board of Governors of the Federal Reserve System’s press release “Federal Reserve issues FOMC statement of longer-run goals and policy strategy” available at <https://www.federalreserve.gov/newsevents/pressreleases/monetary20120125c.htm>.
4. There are, unfortunately, extreme, and tragic, examples of when inflation hits very high rates, such as an annual percentage change of more than 100 percent. People in such situations resort to bartering (or exchanging goods and services directly for other goods and services) because holding cash has become too costly.
5. Hajdini et al. (2022) use survey data to provide a causal estimate of the impact on individuals’ income expectations following an unexpected increase in inflation. This differs from the expected and consistent trend inflation discussed in this *Economic Commentary* but remains suggestive of people’s pessimism that their wages will keep up with the rate of inflation.
6. This is a generalization about common stock returns as a whole and may not be true for individual securities. Well-positioned firms in the real estate sector, ETFs (exchange traded funds), and mutual funds designed as inflation hedges likely do not follow this pattern.
7. As discussed, it is often difficult and costly for firms to raise prices, incentivizing them to make larger price adjustments infrequently. This creates “lumpy” price changes that make prices higher than the profit maximizing price immediately following an increase but allows the relative price to fall below the profit maximizing price after time passes under elevated inflation. This lowers overall firm profits.
8. See Fama and Schwert (1977) for a breakdown of different asset class returns amid both expected and unexpected levels of inflation.
9. For a deeper discussion of the relationship among the slope of the Phillips curve, trend inflation, and optimal monetary policy, see L’Huillier and Schoenle (2023).
10. See Jerome Powell’s August 24, 2018, speech for an overview of the debate: “Monetary Policy in a Changing Economy” available at <https://www.federalreserve.gov/newsevents/speech/powell20180824a.htm>.
11. See both Del Negro et al. (2020) and Hazell et al. (2022) for recent estimates of the slope of the Phillips curve.

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