

Inflation-Targeting Monetary Policy and Stock Prices

Keun H. Lee, Ph.D.

Professor of Economics
Northern State University
Aberdeen, South Dakota 57401
United States
(605) 626-2576 (office)
keun.lee@northern.edu

Abstract

The Federal Reserve Bank has recently tweaked its monetary policy stance of easy money and raised the interest rate to tame inflation. The rationale is that a higher interest rate would bring down demand and lower prices. But a higher interest rate generally lowers the stock market also. Falling demand and the stock market fall, in turn, may also slow down the economy. This paper examines how a rising interest rate could moderate inflation and bring down the stock market. It also examines the possibility that raising interest rates to tame inflation may not necessarily lead to an economic slowdown.

Keywords: Inflation-targeting Monetary Policy, Price Inflation and Stock Prices, Demand and Supply Prices

I. Introduction

During the 1970s, the U.S. suffered two bouts of double-digit inflation, the first in the middle of the decade and the second at the end of the decade. The first bout traces its roots to the Vietnam War combined with the first oil shock and the second to the Iranian Revolution, which led to the second oil shock. An immediate problem with inflation is income redistribution, with the burden falling heaviest on those who are least able to bear it.

Moreover, surging prices also disturb the stability in both the labor and goods market, hence sustained growth of the economy through expectations. At the Jason Hole Symposium in late August this year, the Federal Reserve Bank (henceforth the Fed) Chair, Jerome Powell, said, “The longer the current bout of high inflation continues, the greater the chance that expectations of higher inflation will become entrenched.”¹ Once higher inflation expectations become entrenched, people act on expectations by building them into wage and pricing decisions, raising prices to the expected level. In short, expectations are self-fulfilling, leading to a vicious cycle of inflation and expectations feeding on each other. Powell added that price stability is the “bedrock of our economy” and “without price stability, the economy does not work.”

In the early 1980s, Paul Volker, then the chairperson of the Fed, raised the federal funds rate sharply to fight inflation. In 1978, the federal funds rate stood at 7.94%, with the inflation rate at 13.3%. Volker took the position as the head of the Fed in August 1979 and began to raise the federal funds target rate soon after. On several occasions, he raised it even to 20%. His action led the annual average of the federal funds target rate to rise to 11.2% in 1979, 13.35% in 1980, and 16.39% in 1981.² Volker’s effort paid off, and the inflation rate fell to 3.8% in 1982.³ Since then, it remained below 5% for the most part until recently. The policy to keep the interest rate below a certain level by raising the interest rate is known as the “inflation-targeting monetary policy.”⁴

¹ Powell, Jerome, Fed Chair Jerome Powell’s Speech at Jackson Hole Symposium, Bloomberg News, August 26, 2022. <https://www.federalreserve.gov/datadownload/Download.aspx?rel=H15&series=a1751f8a5f8debfb84eb1615c81ecad&from=01/01/1970&to=12/31/2022&lastObs=&filetype=sheetml&label=include&layout=seriescolumn>

³ Amadeo, Kimberly, Fed Funds Rate History: Its Highs, Lows, and Charts - How the Benchmark Has Changed Through History, updated June 15, 2022, <https://www.thebalance.com/fed-funds-rate-history-highs-lows-3306135>

⁴ The inflation-targeting policy is a legacy of New Classical Economics, which dominated the intellectual climate in the economic and political establishments from the early 1980s until the financial crisis in 2008. Keun H. Lee examines in greater detail how this policy came about and evolved and its consequences (Lee, Keun H., *Economics of Keynes: Common Sense*, unpublished manuscript, 2022, p. 680-683.)

But the stock market also reacted to the rising interest rate; indeed, it reacted to the Fed's action long before prices increased. Volker started raising the federal funds rate in late 1979. In 1980 and 1981, long before price inflation came under control in 1982, the Dow Jones 30 Industrial Average fell by 9.23% and the S&P 500 by 9.7%.⁵ The federal funds rate is an overnight interbank loan rate and an important benchmark for the interest rate banks charge for loans. Thus, raising it is the same as raising the interest rate. And rising interest rates also claimed high economic costs. In 1979, the GDP grew by 6.0% with a 6% unemployment rate despite rampant inflation, or perhaps because of it. GDP growth fell into negative territory with rising unemployment in 1982; it fell by 1.9%, and the unemployment rate rose to 10.8%.

When inflation came under control in 1982, the Fed quickly reversed the course of action. The annual average federal funds target rate came down to 12.24% in 1982 and 9.09% in 1983. The stock market also reacted quickly. In 1982, the Dow Jones 30 Industrial Average rose by 19.60%, while the S&P 500 rose by 14.8%. The next year, in 1983, the stock market went even higher; the Dow rose by 20.27% and the S&P by 17.27%. The economy also recovered rapidly after hitting its bottom in 1982. In 1983, the GDP grew by 4.2%, and the unemployment rate fell to 8.3%.

II. Return of Inflation in 2020

In 2020, inflation returned and spiked again, as shown in the chart below. It further increased in 2022, averaging 8.15% during the first five months of 2022, from January to May, and rising even higher in June to 9.1%. Possible causes for the spike in the inflation rate include several recent developments on both the demand and supply sides.



Developments on the demand side include the three rounds of Economic Impact Payments in 2020 and 2021 (\$1,200, \$600, and \$1,400 each) to stimulate demand and prevent the economy from falling into a deep slump due to the Covid-19 pandemic. On the supply side, as the government imposed social distancing to prevent the spread of the Covid-19 pandemic, firms also laid off workers from early 2020, leading to a significant fall in output. The pandemic's spread waned significantly lately, and firms were willing to increase hiring. As many firms rushed to hire, they suddenly found a shortage of workers, leading to wages rapidly climbing. Rising wages, in turn, exacerbated the shortage; as many workers left their job for better wages, it produced further bottlenecks in the labor market and production.

Other events also exacerbated the supply-side woes. Russia's war against Ukraine led to an embargo on Russian oil imposed by the U.S. and Europe, creating a severe oil shortage in the world market and pushing gas prices through the roof. The war also disrupted the export of agricultural products from Ukraine to the world market, creating a shortage and raising prices. China's zero-Covid strategy also led to lockdowns of a major city in China, Shanghai, disrupting the supply chain. The Chinese government imposed another lockdown on Chengdu in late August, another big city in China.

In response to the surging prices, the current Fed Chair, Powell, also began to raise the federal funds rate in March 2022 like his predecessor. Initially, the Fed raised it by 25 basis points (0.25%) in March 2022 but by 50 basis points

⁵ Yahoo! Finance

(0.5%) in May to keep the federal funds target rate at 0.75% to 1%. In June and July, the increases were higher by 75 basis points (0.75%), each to keep the federal funds target rate at 2.25% to 2.50%. Even at those levels, the federal funds target rate was still relatively low by historical standards. But many saw the increase as drastic, as the target rate has been at or near zero percent since the Covid-19 outbreak in early 2020. The first to react to the Fed's action was again the stock market. The market was at an all-time high at the beginning of 2022. When the Fed began to increase the interest rate in March, the stock market quickly reacted and headed south. For the first six months of 2022, the S&P 500 index dropped by 25%, while the Nasdaq fell by 30%, with little sign of recovery.⁶ But the current stock market drop was not as violent and drastic as it was in early 2020 when fear of the Covid-19 pandemic first swept the market. Instead, the market went up one week and down the next, falling gradually with the fall outpacing the rise.

At the Jackson Hole Symposium, Powell repeated his pledge for further increases in the interest rate until the inflation rate fell to the desired level of 2%, as suggested in his speech. The market reading of his pledge was that the Fed might increase the federal funds rate by another 75 basis points or more in the next round of Federal Open Market Committee meetings. This reading led the S&P 500 and Nasdaq to fall by more than 3% on the day of the speech.

III. Effect of Money on Inflation and the Stock Price

The focus of the Fed's action is often on the interest rate, but raising the interest rate also involves tightening the money supply. When the Fed raises the interest rate, it sets the federal funds target rate higher. The Fed then reduces the money supply through open-market operations (OMOs) to bring the overnight interbank loan rate to the target rate. Reducing the money supply will increase the overnight interbank loan rate in the market close to the federal funds target rate but not likely to precisely the same level. The overnight interbank loan rate in the market led by OMOs is called the effective federal funds rate in contrast to the target rate. The effective federal funds rate is an important benchmark for the interest rate banks charge for loans. Thus, when it rises, the market interest rate follows suit.

The theoretical basis for changing the money supply through OMOs to bring the interest rate to the desired level is Keynes's view that the interest rate is the balancing factor between the supply and the demand for money.⁷ Thus, the immediate effect of the money supply will be on the interest rate to bring the demand for money into equality with it. Indeed, if the interest rate is not the balancing factor and does not respond to the supply of money, the monetary policy would have no bearing on the interest rate and the economic system.

At issue is how the Fed's action moderates inflation and lowers the stock price. One argument often put forward is that the Fed's action would bring inflation under control by nipping the bud of incipient inflation expectations. Nipping expectations would be an important step to taming inflation, as they tend to be self-fulfilling. But this argument takes it for granted that the Fed's action somehow moderates inflation without spelling out how.

Several explanations are possible for the effect of the Fed's action on price inflation and the stock price. But it is through the demand for commodities and stocks that the Fed's action influences inflation and the stock price in all explanations. Powell's Jackson Hole speech highlights the influence of the Fed's action on demand, hence price inflation. In his words,

Restoring price stability...requires using our tools forcefully to bring demand and supply into better balance....[T]he current high inflation in the United States is the product of strong demand and constrained supply, and...the Fed's tools work principally on aggregate demand.⁸ The Fed's action to raise the interest rate involves tightening the money supply, as seen above. Thus, it could influence demand for commodities and stocks through the money supply, the interest rate, or both. Explanations differ on which of the two, the money supply or the interest rate, and how it influences the demand.

V. Quantity Theory of Money and Stock Prices

One explanation for the effect of the Fed's action on demand for commodities is through the money supply, not the interest rate based on the quantity theory of money. The quantity theory of money rests on two premises. One is that the sole utility of money is to purchase goods and services or output, and thus people spend all their money on purchasing them. The other is that the output currently produced remains fixed for the most part.

⁶ Yahoo! Finance

⁷ Keynes, John Maynard, *The General Theory of Employment, Interest and Money*, London: Macmillan, Cambridge University Press, for the Royal Economic Society, 1973, first published in 1936, p. 222.

⁸ Powell, Speech at Jackson Hole Symposium, Bloomberg News.

The Fed's action to raise the interest rate by tightening the money supply reduces the quantity of money. Since people spend all their money on purchasing output, the decrease in the quantity of money will decrease demand for them. But the output currently produced remains unchanged, and thus the quantity of money could affect only the prices of goods and services. With less money available, all currently produced commodities will lose value against money and become cheaper, moderating inflation.

Why would the stock market also react to the Fed's action? The quantity theory of money above is a variation of the original version by Irving Fisher. In Fisher's original version, people use the money for purchasing not just output currently produced but also stocks and bonds, labor services, or even real estate. Fisher collectively names purchases of all these items "transactions."⁹

In Fisher's version of the quantity theory of money, the effect of the Fed's action on demand for stocks will also be through the money supply, not the interest rate. Thus, a decrease in the quantity of money will decrease the demand for everything people buy, including currently produced output and stocks. But the volume of transactions will likely remain constant for a short period. Thus, the fall in the quantity of money would affect only the prices, including stocks.

In Fisher's version of the quantity theory of money, there is no particular reason for the demand to fall more for one thing and less for another. Thus, the fall in demand for currently produced output and stocks and their prices would be simultaneous and uniform. Milton Friedman narrowed the field of Fisher's transactions to only the currently produced goods and services, leading to the present version of the quantity theory of money in which money will affect only the prices of commodities produced, as seen above.¹⁰

In Fisher's original quantity theory of money, the Fed's action leads to changes in demand for commodities and stocks through the quantity of money. But the stock market usually reacts to the Fed's action before the commodity market. In Fisher's theory, the change in demand for output and stock and their prices is simultaneous and uniform. Thus, Fisher's theory cannot fully account for the effect of the Fed's action on the commodity and stock market.

V. Effect of Money on Asset Demand with Debt Financing

The demand for currently produced output includes goods and services devoted to both investment and consumption. Individuals and businesses purchase them either with borrowed money, *i.e.*, debt financing, or with their income or savings, *i.e.*, equity financing. The interest rate is the cost of borrowing money. As the Fed's action involves changing the interest rate, it could also influence the demand for currently produced output with borrowed money and prices. The interest rate could also influence the demand and price through equity financing – more on this shortly.

When the central bank raises the interest rate, it would be a drag on investment, as businesses can ill afford to borrow money at a higher interest rate for investment. A higher interest rate will also cool down demand for consumer goods, durable or non-durable. Households often purchase durable goods, such as cars and high-ticket items, with borrowed money, and a rising borrowing cost will discourage purchasing them. Rising interest rates also increase the interest payments or debt service for consumer credits, especially with adjustable interest rates, such as credit cards. Thus, a higher interest rate could also be a drag on consumer spending on non-durable goods and services.

What about the stock price? A restrictive monetary policy with a rising interest rate also reduces the demand for stocks, lowering the price. When the Fed raises the interest rate, the cost of borrowing money to purchase stocks also rises. Thus, it will discourage stock investors from borrowing money and investing in stocks, dragging down the demand for stocks and the price.¹¹

Aside from the high cost of borrowing money to purchase stocks, people also pay close attention to the prospect of corporate profit when investing in stocks. When the demand for investment and consumer goods falls, led by rising interest rates, it will also ripple across the economy through the income-constrained or the multiplier process, as textbooks often name it, decreasing output production and income. When the economy slows down, corporate profits will also fall. In anticipation of falling corporate profits, it is time for stock investors to head to the exit, pushing the stock market down.

⁹ Fisher, Irving, *The Purchasing Power of Money: Its Determination and Relation to Credit, Interest, and Crisis*, The McMillan Company, New York, 1920, p. 14-28.

¹⁰Friedman, Milton, "A Theoretical Framework for Monetary Analysis," *Milton Friedman's Monetary Framework*, ed., by Gordon, Robert J., The University of Chicago Press, 1974.

¹¹ As businesses raise funds in the stock market to finance investment, the falling stock prices led by the high borrowing cost may also hold back investment.

As seen above, raising interest rates will lead to falling commodity and stock demand, lowering prices. Moreover, the stock market would react to the Fed's action faster than the commodity market, as it acts on an expected fall in corporate profit with a slowing economy led by rising interest rates. Acting on expectation is forward-looking and could respond to the Fed's action much faster than the commodity market.

At the moment, it is unclear whether the economy will slow down and enter into a recession. Nor is it clear how severe the recession will be and how long it will last if the economy runs into it. Since the labor market is currently tight, as seen above, some even deny the possibility of a recession despite rising interest rates. This uncertainty explains why the stock market has been jittery, up one week and down the next. Nonetheless, the market has been gradually falling, signaling that the anticipation of a recession has been outpacing the opposite sentiment in the market.

VI. Effect of Money on Asset Demand with Equity Financing

As the interest rate is the cost of borrowing money for borrowers, it is also the reward for parting money for lenders. If people hold money instead of lending it, they will sacrifice this reward. Thus, the interest rate is the foregone return from money. People will be willing to sacrifice this reward and pay the price by holding money if money produces yields worth the price paid. Among others, one yield produced by money would be the convenience that liquidity money provides to purchase long-term assets to "profit from knowing better than the market," named liquidity premium.¹²

As the Fed's action involves changing the interest rate, it could also influence the demand for currently produced commodities and stocks. When the Fed changes the interest rate, it changes the return on money or the liquidity premium, especially relative to other assets. People will direct the demand for assets to those that promise the greatest return; as Keynes says, it is the greatest of the three assets that rule the "roost."¹³ Thus, the demand for various assets may also change, leading to a change in their prices and production. Keynes's discussion of the shift in demand for assets involves three assets: money, capital assets, and consumption goods.¹⁴ Shifting demand between money and capital and consumption assets essentially means purchasing or selling other assets with money, hence equity financing.

Capital and consumption assets both produce a stream of yields. The return from capital assets is the marginal efficiency of capital, *i.e.*, the discount rate, which makes the present value of the stream of prospective yields equal to the asset's purchase price.¹⁵

$$P_k = \frac{E_0}{(1+d)^0} + \frac{E_1}{(1+d)^1} + \frac{E_2}{(1+d)^2} + \dots + \frac{E_n}{(1+d)^n},$$

where P_k is the purchase price or the current market price of capital assets; E_i is the earnings or cash flow for each period; and d is the discount rate, which is the return from stocks or the marginal efficiency of capital. Finally, n is the number of periods depending on the life of capital assets.

Similarly, the return from consumption goods will also be the discount rate, which makes the present value of the stream of prospective yields from them equal to their purchase price:

$$P_c = \frac{E_0}{(1+d)^0} + \frac{E_1}{(1+d)^1} + \frac{E_2}{(1+d)^2},$$

where P_c is the purchase price of consumption goods; E_i is the yield for each period; and d is the discount rate or the return from consumption goods. Unlike capital assets, consumption goods are short-lived, as they satisfy the present wants and needs. The expression above assumes that their life last three periods.

To illustrate the shift in demand for assets, assume that the central bank's actions decrease the quantity of money available and raise the interest rate. With a rising interest rate, the return on money increases relative to other assets, and people will direct their demand for assets away from other assets to money. However, the shift in demand away from other assets will not be the same across different assets but will depend on the influence of the interest rate on their price.

¹² Keynes, p. 170.

¹³ *Ibid*, p. 223.

¹⁴ *Ibid*, p. 226.

¹⁵ *Ibid*, p. 135.

In a state of balance or equilibrium, the returns from all assets must be equal, and there should be nothing to choose in the way of advantage among them.¹⁶ In other words, the marginal efficiency of capital and the return from consumption goods, *i.e.*, the discount rate d in both expressions above, must be equal to the interest rate, the return on money.¹⁷ That being the case, the interest rate, i , can replace d for both stocks and consumption goods. In other words, the present value of the yield for each period discounted by the interest rate, i , must be equal to the present value of the stream of prospective yields discounted by d and their purchase prices, P_k and P_c :

$$P_k = \frac{E_0}{(1+i)^0} + \frac{E_1}{(1+i)^1} + \frac{E_2}{(1+i)^2} + \dots + \frac{E_n}{(1+i)^n}$$

$$P_c = \frac{E_0}{(1+i)^0} + \frac{E_1}{(1+i)^1} + \frac{E_2}{(1+i)^2}$$

Keynes names the present value of the stream of the prospective yields discounted by the interest rate, the expressions on the right-hand side of the equations, the “demand price.” On the other hand, the purchase or current market prices of capital and consumption goods on the left-hand side of the equations, P_k and P_c , are named the “supply price.”¹⁸ When the interest rate increases, the present value discounted by the interest rate, i , or the demand price, will fall below the supply price, making the current market price of both assets, P_k and P_c , to be overvalued. Thus, the demand for both assets will fall; people would prefer to hold money instead for the convenience of liquidity to purchase assets in the future to profit from them.

But the demand price will be more sensitive to the interest rate for long-lived assets than for short-lived assets. Capital assets are long-lived with a long stream of future yields, as seen in the expression above, and thus a rise in interest rate will significantly lower the demand price for capital goods. On the other hand, consumption assets are short-lived with a short stream of future yields, and a fall in the demand price due to a rise in the interest rate will be negligible. As the demand price for capital goods falls more than the demand price for consumption goods, their market price will also be more overvalued, leading to a greater fall in demand for capital goods than for consumption goods.

When the demand for capital assets and consumption goods declines, the market price or the supply price for both will fall toward the demand price. The demand will continue to decrease until the supply or market price falls to the demand price for both. As the capital assets are more overvalued and demand falls more, their price will also fall more than the price of consumption goods. When P_k and P_c fall toward the demand price, the discount rate, d , will rise and become equal to the interest rate.

Aside from falling prices, the decrease in demand for capital and consumption assets will also discourage their production. In Keynes’s theory, producers decide on the production level based on sale proceeds or demand.¹⁹ As the demand for capital assets will decrease more than the demand for consumption assets, the production of capital assets will also decrease more than the production of consumption assets. Stock exchange equities are the titles of ownership of capital assets in physical form, and their return will be the same as the return on capital assets. Thus, a rising interest rate will also lower the demand price of stocks, making them overvalued and lowering their demand. But stocks are also long-lived with a long stream of future yields as their counterpart, *i.e.*, capital assets in physical form, so a rise in interest rate will lower their demand price much more than the demand price of consumption goods.

As the demand price for stocks falls more than the demand price for consumption goods, their market price will also be more overvalued, leading to a greater fall in demand for stocks than for consumption goods. The decrease in demand for both will continue until the supply or market price falls to the demand price. As stocks are more overvalued and the demand for them falls more than the demand for consumption goods, the fall in the stock price will also be much more.

Aside from the falling prices of stocks, the fall in demand for stocks will also dampen the production of capital goods. Producing capital assets with funds offered through the purchase of stocks amounts to financing capital asset production with equity. Besides, newly produced capital assets are also investment goods and add to the community’s stock of capital assets. Thus, producing new capital assets with funds offered through the stock market is the same as producing investment goods with equity financing. As the demand for stocks decreases more than the demand for consumption assets, the production of investment goods financed with equity will also decrease more than the production of consumption goods.

¹⁶ *Ibid*, p. 227-228.

¹⁷ Aside from returns, capital and consumption assets will also suffer from some form of carrying cost, such as storage and wastage, through time. But it would be convenient to simplify the discussion somewhat by assuming that their carrying costs are negligible.

¹⁸ Keynes, p. 227, *et seq.*

¹⁹ *Ibid*, p. 47.

The varying influence of the interest rate on the prices across different assets is not novel; it is Irving Fisher speaking in Keynes's voice. In Fisher's words,

Whether or not due to monetary changes, a movement of interest will tend to make the prices of different things vary in different directions or to different extents. The prices of all goods, the benefits of which accrue in the remote future, depend on the rate of interest A fall in interest from 5 per cent to 4 per cent will cause a rise of the value of the land, in the ratio not of 4 to 5, but nearly of 4 to 7. On the other hand, mining land or quarries with a limited life will be less sensitive [to interest] The same is true of dwelling, machinery... and so on down the scale until we reach perishable and transient commodities, such as food and clothing, which are only indirectly affected by changes in the rate of interest.²⁰

In the discussion above, the Fed's action influences the demand for consumption goods and stocks and their prices through the interest rate. But when the Fed increases the interest rate, the demand price for stocks falls more than consumption goods, leading the demand for stocks and their prices to fall more than consumption goods. Thus, an upshot of this discussion is that the stock market must fall significantly before the price level of goods shows a sign of falling.

In passing, it might be worth pointing out the contrast in the effect of money on prices between the quantity theory of money and Keynes's theory. In the quantity theory of money, the effect of money on prices is direct, as people spend all their money on a fixed quantity of output. In Keynes's theory, the effect is indirect through the interest rate; the money supply changes the interest rate first, followed by changes in the demand and market prices.

VII. Moderating Inflation and Recession

Another issue is whether the Fed's action to bring the inflation rate under control will necessarily lead to a recession. The answer depends on how the Fed's action influence demand and prices. In the quantity theory of money, tightening the money supply will reduce demand for commodities and stocks, leading to both losing values against money and becoming cheaper. But this theory assumes the volume of transactions remains constant in the short run; thus, tightening the money supply will only lead to a fall in prices, not the volume of transactions, ruling out the possibility of a recession.

But the other explanations of the effect of the Fed's action on demand through the interest rate do not rule out the possibility of a recession. In other words, the fall in demand may not just lead to a fall in prices but also production and employment. As seen above, a rise in the interest rate may increase the cost of borrowing and discourage borrowing for investment and purchasing consumer goods, durable or non-durable. It may also raise the rate of return from money relative to other assets, dampening the demand for consumption goods and stocks and lower prices. The fall in demand for stocks will also dampen the production of new capital goods, which add to the community's stock of capital assets, hence investment goods.

Falling demand for consumption and investment goods led by either the rising cost of borrowing or return from money relative to other assets may ripple across the economy through the income-constrained or multiplier process, leading to a fall in production and rising unemployment, as seen above. Thus, unlike the quantity theory of money, a recession would seem inevitable in explanations of the effect of the Fed's action based on the interest rate.

But the income-constrained process that transmits the effect of demand to production and employment is not instantaneous but gradual. In other words, it may take time for production and economic activities to react to the full extent. In the meantime, however, falling demand may still lead to a decrease in production and employment to a certain extent. Thus, a mild recession may be inevitable. But if the Fed brings down commodity demand and prices quickly and reverses its actions before production responds to the full extent, it would be possible to avoid a serious recession, though a mild one is inevitable.

The demand for commodities and stocks depends on the interest rate, whether financed with debt or equity; the faster and larger the increase in interest rate, the quicker and larger the fall in demand for investment and consumer goods. Thus, if the Fed raises the interest rate quickly in large increments, the fall in demand and price will be rapid and large. Since production may not have enough time to react to the fall in demand, falling demand will not necessarily lead to a serious recession immediately.

By contrast, if the Fed raises the interest rate gradually in small increments, the fall in demand and price will also be slow and small. A gradual fall in demand over an extended period will give enough time for production to react,

²⁰ Fisher, p. 193.

leading to a serious economic slowdown. Since the price fall is gradual and small, it will also lead to inflation persisting over a prolonged period.

Besides, the gradual fall in demand led by an increase in the interest rate in small increments could bring about another undesirable outcome. As production falls gradually, led by falling demand, it will accompany rising unemployment while inflation persists, as seen above. The outcome would be a familiar but much-dreaded combination of stagnating output with unemployment and high inflation, *i.e.*, stagflation. And stagflation could force the Fed to abandon its effort to bring inflation under control with tight money. Instead, the Fed may lower the interest rate to stimulate the economy and reduce unemployment.

Many believe that a gradual increase in the federal funds rate in small increments is desirable to avoid excessive disruption in the stock market. While this belief could be legitimate for the stock market stability, it is highly misguided for bringing inflation under control without a serious recession. A gradual increase in the interest rate and falling demand will only increase the chance that production reacts to falling demand and the economy runs into a severe recession. Indeed, the opposite is needed; the Fed should decrease the money supply and raise the interest rate sharply and promptly, forcing the stock market to fall greatly. With a large fall in the stock market, commodity prices will also fall and moderate inflation before production reacts to falling demand in full force.

As seen above, the stock market has been falling but only gradually. The discussion above suggests that the gradual fall could be due to an insufficient interest rate rise to warrant the rush to the exit, leading to the market collapse. Moreover, unless the fall in demand for stocks and prices is substantial, there will be only a slight decrease in commodity demand and price.

The Fed raised the federal funds rate by 25 basis points in March, followed by 50 basis points in May and 75 in June and July. According to the discussion, increasing the rate by larger increments, say by 75 basis points, from the beginning would have been more effective in bringing down inflation while avoiding a serious recession. The Fed pledged more increases in the future until the inflation rate falls to the desired level, depending on the inflation trend. In other words, if there is a sign of improvement on the inflation front in the coming months, the Fed may raise the interest rate in smaller increments. However, an improvement in inflation for one or two months will be insufficient to warrant a change in the Fed's policy stance.

VIII. Conclusion

The discussion above examined two possible scenarios for the present gradual fall in the stock market. First, investors are uncertain about the economy's outlook and corporate profit, which leads the stock market to waver. The uncertainty about the economy's outlook indicates that the economy is not in a serious recession yet.

The reason may be that production has not reacted to falling demand led by rising interest rates to the full extent yet or that the rising interest rate has not brought down commodity demand sufficiently. But inflation is still rising, though there have been slight improvements in recent months. The message seems clear: since the economy is not in a serious recession yet, there is time to raise the interest rate further to bring inflation down quickly.

Second, the stock market must fall substantially first for commodity prices to show a sign of a meaningful fall and moderate inflation. But the gradual fall could be due to an insufficient interest rate rise to warrant the rush to the stock market exit while inflation still runs high. The message is the same: the interest rate must rise more, and the stock market must fall further to bring inflation down.

Falling demand led by rising interest rates could slow economic activity even if the Fed acts quickly and decisively, as production and employment respond to falling demand gradually, as seen above. However, when the inflation rate falls below the target rate, the Fed can swiftly reverse the course of action and turn the liquidity tap on again, lowering the interest rate. This action will help restore the demand for consumption and investment goods with borrowed money, production, and employment. It may also lower the return from money relative to other assets, increasing the demand for consumption and stocks. Although production and economic activities may not react immediately, increasing demand could put the economy on the normal growth path and avoid a deep slump.

Besides, lowering the interest rate to stimulate demand will not necessarily flare up inflation again. In the first place, output production often responds to it faster than prices in a sluggish economy; thus, an increase in demand led by a lower cost of borrowing is not likely to rekindle inflation. Moreover, the demand for consumption goods will be much smaller than the demand for stocks and, consequently, the increase in their prices, as seen above. That lowering interest rates will not necessarily flare up inflation is not just a theoretical possibility.

Allen Greenspan succeeded Paul Volker in 1987 and served as the chairperson of the Fed until 2006. In 1997-1998, severe financial blowups in many fast-growing Asian countries, including Thailand, Indonesia, and South Korea, known as the Asian Financial Crisis, led to a capital flight from these countries. In response, the Fed flooded the world with dollars lest the capital flight from Asia may cause panic in the global financial market and a global recession. Concurrently, the Fed organized a bailout of Long-Term Capital Management with another hefty dose of dollars.²¹

Despite the large dose of money during this period, price inflation did not tick up but remained moderate, contrary to the conventional view; the inflation rate remained below 5% until recently since the early 1980s, as seen above. Instead, it was the stock price that went out of orbit, which eventually led to what is known as the “dot-com bubble.” Indeed, the increase in demand for consumption goods was much smaller than the increase in the demand for stocks. In plain language, the large dose of money flew into the stock market, not the commodity market – after all, people need only so much of consumption goods.

Greenspan finally raised interest rates at the end of the 1990s and several more times in 2000 to 6.5% to curb the stock market frenzy.²² It was a hard blow to the stock market, ending favorable credit conditions and cutting off the funding for purchasing equity shares. Subsequently, the stock market crashed, and the dot-com bubble ended. Again, the effect of money was primarily on stocks, not so much on consumption goods; despite the stock market crash, price inflation hardly budged and changed little.

²¹ Robert Merton and Myron Scholes, who in 1977 received a Nobel Prize for their work on derivative pricing methods, believed in the models, which led to the collapse in 1998 of their Long-Term Capital Management hedge fund. Skidelsky writes, “They were using phony, bell-curve [normal distribution] mathematics while managing to convince themselves that it was a great science and thus turning the entire financial establishment into suckers.” (Skidelsky, Robert, *Keynes: The Return Master*, Public Affairs, New York, 2010, p. 45-46).

²² Skidelsky, p. 80.