STRATEGIES *for* MONETARY POLICY

EDITED BY
JOHN H. COCHRANE
JOHN B. TAYLOR

CHAPTER SIX

The Interaction of Markets and Policy: A Corporate Finance Perspective

Laurie Simon Hodrick

Our panel has been asked to consider the interaction of markets and policy. In my remarks today, I will specifically consider the interaction between the stock market and the monetary policy of the Federal Reserve, which is set to foster economic conditions that achieve the dual-mandate objectives of maximal employment and price stability (targeted as a 2 percent inflation rate). I want to reconcile seemingly conflicting evidence when we interpret the stock market in its aggregate and when we consider an individual firm that trades in the market.

As we consider stocks in the market, there are important differences between common, or correlated, risks and idiosyncratic, or independent, risks. When we combine many stocks into a portfolio, firm-specific risks diversify away, while systematic risks remain. This important insight is helpful in understanding the drivers by which Fed policy does and does not affect valuations, at both the firm and aggregate levels.

Let's look first at the firm level. Although we know that firm-specific risk diversifies in the aggregate, this does not reduce the importance of idiosyncratic factors to a particular firm. Hence, while all corporations monitor, evaluate, and forecast the macroeconomic environment, and thus implicitly engage in a degree of Fed watching, firms and the investors who value them are also

intensely concerned about that firm's own microeconomic prospects, not only in the short term but also in the medium and longer terms. Let me develop this logic through the lens of corporate finance.

When we value a firm in corporate finance, one common approach is to use the discounted free cash flow model. We calculate the present value of the expected stream of future free cash flows that the firm will have available to pay its investors:

$$\text{Firm Value} = \text{PV}(\text{Future Free Cash Flows}) = \sum_{t=1}^{\infty} \frac{FCF_t}{(1+r)^t}$$

In the next few minutes I will identify the key drivers of this valuation, with the goal of identifying where Fed policy does, and does not, have a first-order effect on the value of a specific firm.

Let's start with the discount rate, *r,* which is the cost of capital used to take the present value of the forecasted future free cash flows:

$$r = WACC = \frac{E}{(D+E)} r_e^L + \frac{D}{(E+D)} (1-\tau_C) r_D$$

For unit consistency between the cash flows and their discount rate, we use firm enterprise-level values after corporate taxation, typically in nominal terms. Here the firm's WACC is its weighted average cost of capital, the effective after-tax cost of capital to the firm. Since WACC equals the weighted average of the cost of equity and the after-tax cost of debt, its three critical components are the cost of equity, r_e^L, the after-tax cost of debt, $(1-\tau_C)r_D$, and the weights that reflect the firm's leverage ratio, $\frac{D}{(E+D)}$. Using Capital Asset Pricing Model (CAPM) methodology, for example, this entails a nominal risk-free rate, the expected market risk premium, the

company's equity beta, the company's debt beta, the marginal corporate tax rate, and a market measure of the proportion of debt to firm value.[1]

Which of these key drivers are and are not affected by Fed policy? Since all firms' costs of capital are derived similarly, firms are commonly affected through the risk-free rate, the equity risk premium, and the tax code, and individually affected through their beta units of priced risk and their leverage. Monetary policy affects the risk-free rate through the rate the Fed sets, and uncertainty about future policy affects the risk premia. It is the firm's asset risk and debt capacity, though, which are unaffected by monetary policy, that uniquely define their cost of capital.

Let's next consider the free cash flows, which each year equal the earnings generated from both core and new investments:

$$FCF_t = NOPLAT_t - Net\ Investment_t$$

To capture cash flows from current investments, we measure $NOPLAT_{t,}$ net operating profit less adjusted taxes. To capture cash flows from investment in new capital, we measure $Net\ Investment_{t.}$ Firms decide how to deploy and allocate their capital, choosing between investments and payments to claimants. A firm's net investment creates value when it is positive net present value, that is, when it earns a risk-adjusted rate of return above the firm's WACC. Said differently, because investment reduces free cash flows in the short run, to be warranted an investment must generate sufficiently larger free cash flows in the future.

Which of these key drivers are or are not affected by Fed policy? Since all firms' free cash flows are derived similarly, firms are commonly affected through aggregate business cycles and aggregate

1. Although here the notation for the discount rate is not maturity dependent, if there is a slope to the term structure, then discount rates will be different for different maturities.

long-term growth rates, including long-term inflation, and individually affected through their specific business conditions and investment opportunities. Monetary policy clearly affects inflation and may affect aggregate cyclical conditions. It is the firm's current competitive advantage and longer-term real growth opportunities, though, which are unaffected by monetary policy, that uniquely define their free cash flows.

Collectively, therefore, monetary policy can affect the risk-free rate and inflation, the risk premium, and the business cycle. It does not, however, affect a firm's asset risk, specific debt capacity, or idiosyncratic business conditions and investment opportunities that generate long-term real growth.

At the firm level, vector autoregressions allow us to decompose innovations in stock returns into news about cash flows and news about discount rates. At the firm level, news about expected future cash flows is an important determinant of firm stock returns. Vuolteenaho (2002), for example, shows that for stock returns at the firm level, the variance of news about cash flows is twice that of the variance of news about discount rates. This suggests a limited role for monetary policy's impact on individual stock returns. As an example of the extremely idiosyncratic nature of firm valuations, *The Economist* analyzed a set of twelve former and current internet-focused unicorns to better understand their current valuations.[2] To justify their current valuations, these twelve firms each must be expected to increase their sales by a compound annual rate of 49 percent for ten years. That expectation equals the actual realization of the extraordinary growth enjoyed by Amazon, Alphabet, and Facebook in the decade after their IPOs.

2. Unicorns are private companies each with a valuation of at least one billion dollars, and these twelve companies have a combined value in excess of a third of a trillion dollars. Currently, there are 344 unicorns worldwide, and *The Economist*'s set of twelve includes Uber, which went public on May 10, 2019. "Herd Instincts" (2019).

How does this firm-level analysis map to the aggregate stock market? Since much of the cash flow news is idiosyncratic, it can be diversified away, while since much of the discount rate news is correlated across firms, it cannot be diversified away. At the aggregate level, Campbell (1991, 1996, and subsequent research) finds that news about future cash flows accounts for much less of the variance of unexpected stock returns than does news about future discount rates. As highlighted earlier, only a subset of the innovations of the discount rate is driven by Fed policy, limiting the Fed's impact. As Cochrane (2008) notes in his chapter in the *Handbook of the Equity Risk Premium,* "almost all stock price movements are due to changing expected excess returns . . . meaning that we have to tie the stock market movements to the macroeconomy entirely through harder to measure time-varying risk premia."

What is the role of the Fed in affecting risk premia? By conducting monetary policy that predictably follows well-understood rules, the Fed can minimize its contribution to aggregate uncertainty, and thus reduce its impact on time-varying risk premia. This is consistent with the model in Pastor and Veronesi (2012) wherein policy changes increase volatility, risk premia, and correlations among stocks. Increased policy uncertainty, as modeled, for example, in Bloom (2009), can also affect aggregate investment and hiring decisions. At the firm level, increases in uncertainty increase the value of real options, including the option to delay investment.

The Fed can also reduce uncertainty by consistently and transparently regulating the banking system. These actions are consistent with financial stability being a goal sought by regulators.[3]

The interaction of markets and policy is actually a full circle. Not only are firm valuations affected by Fed policy, as I have considered

3. Another essential function of the Federal Reserve is to manage the central payment system, which has the potential to be transformed by the distributed ledger technology, as I discussed at the Hoover Structural Foundations of Monetary Policy conference in 2017. See Hodrick (2018).

today, but the Fed also interprets data from the economy, including stock market price levels, as additional noisy signals with which to set its policy. Cieslak and Vissing-Jorgensen (2017), for example, study the impact of the stock market on the Federal Reserve's monetary policy when analyzing the economics behind Greenspan's "Fed put." I expect that the other panelists will discuss this further.

References

Bloom, Nicholas. 2009. "The Impact of Uncertainty Shocks." *Econometrica* 77, no. 3: 623–85.

Campbell, John Y. 1991. "A Variance Decomposition for Stock Returns." *Economic Journal* 101, no. 405: 157–79.

———. 1996. "Understanding Risk and Return." *Journal of Political Economy* 104, no. 2: 298–345.

Cieslak, Anna, and Annette Vissing-Jorgensen. 2017. "The Economics of the Fed Put." Unpublished manuscript, University of California-Berkeley.

Cochrane, John H. 2008. "Financial Markets and the Real Economy." In *Handbook of the Equity Risk Premium,* edited by Rajnish Mehra. Amsterdam: Elsevier.

"Herd Instincts." 2019. *The Economist,* April 20.

Hodrick, Laurie Simon. 2018. "Payment Systems and the Distributed Ledger Technology." In *The Structural Foundations of Monetary Policy,* edited by Michael Bordo, John Cochrane, and Amit Seru. Stanford, CA: Hoover Institution Press.

Pastor, Lubus, and Pietro Veronesi. 2012. "Uncertainty about Government Policy and Stock Prices." *Journal of Finance* 67, no. 4: 1219–64.

Vuolteenaho, Tuomo. 2002. "What Drives Firm-Level Stock Returns?" *Journal of Finance* 57, no. 1: 233–64.