The Volatility Debate: Discussion

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In his paper "The Volatility Debate," Shiller examines a narrow concept of volatility associated with efficiencies as measured by the relationship of stock prices to discounted future dividends. The paper is essentially a review and defense of Shiller's writings on stock price volatility. I have two main criticisms. First, this debate is already in the literature, the evidence against Shiller's concept of efficiency is strong, and it need not be further belabored. Whether his concept of efficiency is appropriate needs more attention. Second, whether stock markets are efficient is of limited consequences for agriculture. Issues of greater interest here are efficiency of the speculative markets in agriculture—commodity markets and land markets—and the mechanisms that explain the volatility in these markets.

Shiller's Efficiency Concept

The most widely accepted statement of the efficient markets hypothesis was given by Fama. A market in which price always fully reflects available information is called efficient (p. 309). This focus continues in more recent concepts of efficiency involving rational expectations and sufficient statistics based on available information. Shiller's concept of efficiency reflected by his charts differs; it is based on perfect foresight, i.e., unavailable information, because it compares price to future dividends unavailable at the time of price formation. The usefulness of his concept is questionable because the shocks responsible for volatility are often unanticipated even stochastically. The importance of whether policy shocks are anticipated has been demonstrated by the new classical school in macroeconomics which has shown that monetary policy effectiveness depends totally on whether changes are anticipated and that regime changes have important impacts on the stochastic processes of economic variables.

The major shocks affecting the agricultural economy (and its speculative markets) in recent decades have been the Soviet grain deal, the switch to a floating exchange rate regime, the energy crisis, and the tight monetary and expansionary fiscal policy of the Reagan administration. It is difficult to argue that these shocks arise from a common stochastic structure which would permit informed anticipation on the basis of available information. These shocks are due to political restructuring either domestically or abroad. Kindleberger argues that the floating exchange rate was adopted because the United States lost its appetite for providing the international public good of money, and no other country was willing to replace it. The energy crisis occurred through cooperation and cartelization of OPEC countries. These shocks were regarded by many as changing the structure of the economy. For some of these shocks, the expected impacts diminished only after we learned how to deal with their effects (e.g., development and acceptance of energy-saving practices and technologies).

When the structure of the economy changes, relationships that transform information into expectations for the future change. Thus, current observations are appropriately given more relative weight in assessing the future through these relationships than in stable periods. (This can be shown formally in a Muth-type model where the stochastic structure changes occasionally, decision makers know when changes occur but must learn about the nature of changes through observations.) In this context, a market may be fully efficient in the sense of Fama and generate the Shiller results. In fact, the Shiller results would be expected after many changes in structure given long-run moderation through policy and technology change. (Shiller implicitly suggests an inability to anticipate future shocks by evaluating all returns beyond 1988 at 1988 levels.) With unanticipated shocks, the perfect-foresight efficiency concept is inadequate as a measure of excess volatility. Alternatively, rather than comparing $x^*$ with $x$,
Shiller's methodology could be revised to compare econometric predictions of $x^*$ with $x$ where the predictions depend only on information available at the time of price formation.

Efficiency of Speculative Agricultural Markets

A number of studies have examined the efficiency of futures markets using the weaker Fama concept. Anderson and Danthine found that futures prices are biased estimates of future spot prices when the quantities of short hedges and long hedges are unequal. Grossman and others found that a futures market is efficient if only one source of uncertainty exists. Danthine found that efficiency fails when information or risk aversion is asymmetric. With these results, futures markets can hardly be expected to be efficient. One reason efficiency is seemingly unattainable in these papers is that information is a free good (which gives rise to Grossman's paradox about the incentive for gathering information). A plausible alternative is offered by Grossman and Stiglitz, who show that costly information leads to an equilibrium level of inefficiency where prices partially adjust enough so that the benefits of information are just balanced with its costs; thus, both informed and uninform flooded traders coexist with no incentive to change. Similar results can be developed with other types of transactions costs, e.g., commissions, and the framework is sufficiently general to apply to agricultural land. While these considerations are more plausible in reality, the data requirements make applicability difficult to test empirically. Thus, the nature of inefficiency in speculative agricultural markets will likely remain open for some time.

More General Issues of Volatility in Agriculture

An important problem with the excess volatility concept used by Shiller is its neglect of intermarket considerations and government intervention. A number of studies have examined the relationship of market adjustments when some markets are more flexible than others. These markets have their roots in the neo-Keynesian school. Okun argues that manufacturing goods and services are characterized by fixed prices because of search costs associated with price revisions, whereas basic commodity markets are flexible because of product homogeneity which facilitates relatively costless price changes. Hicks gives an alternative justification of the fix/flex price framework based on whether inventories are held for speculation versus meeting demand at fixed prices. Dornbusch shows that a monetary shock causes flex-price asset and exchange rate markets to overshoot their long-run equilibrium in order to take up the slack caused by sluggish short-run adjustment of fixed-price markets.

Several studies have found empirical evidence of the importance of these implications for agriculture. Frankel and Hardouvelis found that nominal interest rates and commodity prices move in opposite directions when a surprise occurs, which they argue is explained only by a fix/flex price model. Cavallo, and Rausser et al. found Dornbusch-type exchange rate overshooting to have important implications for Argentine and U.S. agriculture, respectively. These results imply that volatility cannot be fully explained by focusing on the speculative markets alone. A complete answer requires understanding the economic structure of mechanisms through which volatility occurs.

As the U.S. agricultural sector was internationalized in the 1970s, it became subject to a much broader set of unanticipated shocks including domestic and foreign macroeconomic policies, strategic political considerations (embargoes, trade agreements, and negotiations), and foreign agricultural policies in addition to domestic agricultural policies, weather, and pests. As argued elsewhere (Just), agricultural sectors have incurred substantial volatility from these shocks because capital market imperfections, risk aversion, costs and lags of adjustment, protectionism, fixed and uncertain adjustment of sector policies, and uncertainty of retaliation cause sluggish quantity and thus rapid price responses. Addressing the volatility issue in agriculture requires understanding how these factors cause macroeconomic, political, and international phenomena to be imposed relatively heavily on agriculture. Understanding these mechanisms may reveal, for example, that macroeconomic policy instability imposes socially inefficient (excess) volatility on the speculative flex-price sectors of the economy. This could be the case even when the effects are anticipated and thus fit the Shiller efficiency concept. Thus, if excess volatility is defined as a level of instability beyond a social welfare optimum, then the
Shiller efficiency concept is neither necessary nor sufficient for excess volatility.

References