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The Economic Role of Speculation

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Summary

- Although speculation is often blamed for causing problems in markets, the economic evidence shows that it is in fact a necessary activity that makes markets more liquid and efficient, which in turn benefits hedgers, investors, and other market participants.
- Speculation increases market liquidity by reducing bid-offer spreads, by making it possible to transact more quickly at a given size, and by making markets more resilient.
- Speculators make markets more efficient by helping move prices closer to fundamental values: short sellers, for example, provide discipline against overpricing while speculative buyers counteract unjustified drops in price.
- Without speculation, markets would be less complete in that there would be fewer opportunities for other market participants, especially hedgers, wishing to manage the risks they encounter in their financial activities.

Introduction

Speculation periodically becomes the subject of intense debate. One claim is that speculation, especially in the form of short selling, leads to higher market volatility: in the European Union, for example, French President Nicholas Sarkozy and German Chancellor Angela Merkel called for "an EU-wide prohibition of 'naked' short selling of all or certain shares and sovereign bonds as well as of all or certain naked sovereign CDS". Another claim is that speculation leads to unjustified drops in price: in the U.S. in late 2008, the Securities and Exchange Commission imposed a temporary ban on short selling of the stocks of certain financial institutions. But the problem is not always short-selling. Speculators sometimes are accused of causing unjustified rises in prices: when oil prices rose sharply during the summer of 2008, for example, many observers claimed that speculators, and not fundamental factors, were the reason for the increases. While such claims attracted great attention at the time they were made, subsequent analysis failed to support the claims (e.g., Boehmer, Jones, and Zhang 2009; CFTC 2008).

Critics of speculation sometimes distinguish between "legitimate" hedging applications of derivatives and "purely speculative" applications; the debate about naked credit default swaps is an example (Moshinsky and Kirchfeld 2010). Further, some equate speculation with taking huge risk positions or

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even with outright gambling. But speculation in practice is less dramatic, and in fact is a necessary part of efficiently functioning markets. A market without speculators is likely to be a market without liquidity, not to mention a market with less meaningful prices than those in markets with speculators. But although speculation is ubiquitous, it is not easy in practice to identify specifically how much activity is speculative and how much is not (see inset "How important is speculation?"). It is the objective of this Note to define speculation and explain its role in markets as reflected in economic research on financial markets.

Defining speculation

There are several definitions of speculation, each with its own particular emphasis. One definition is that speculation is "the assumption of considerable business risk in expectation of commensurate gain," in which commensurate gain refers to a positive return in excess of a benchmark risk-free alternative (Graham and Dodd 1934). The expectation of a positive gain serves to distinguish speculation from gambling, in which the gambler takes on risk for its own sake despite the significant prospect of a loss; in statistical terminology, people might gamble even if doing so were to involve a "negative expected gain." Another definition characterizes speculation as taking on risks in anticipation of a favorable price change that is not the result of actions taken by the risk taker (Working 1931). While consistent with the first definition, this definition differentiates speculation on price changes from value-added business activity such as processing and transportation of a commodity, as well as from manipulation of a market in order to induce a price change (Duffie 2010). Finally, a third definition describes speculation as taking on risk in order to profit from one's view about what will happen to prices in the future (Harris 2003). This definition emphasizes that speculators seek to profit from their ability to collect, analyze, and interpret publicly available market information.

The economic literature on market microstructure, which studies various trading processes and forms of market organization, emphasizes the third definition (O'Hara 1995). The microstructure literature characterizes speculators as "informed traders," who seek out and use information about fundamental values. A major category of informed trader is value traders, who focus on values of individual instruments; value traders take short positions in assets they believe are overpriced and long positions in those they believe are underpriced. Another major category is arbitrageurs, who focus on relative values between financial instruments; arbitrage by its nature involves offsetting long and short positions. Other categories of informed trader include news traders, who anticipate changes in value, and technical traders, who analyze price patterns. All have in common that they hope to profit from their ability to acquire and act on market information.

The existence of informed traders in the market microstructure literature implies the existence of "uninformed traders," that is, market participants who do not generally trade on the basis of an advantage in using information. A major

How important are speculators?

As explained in the Note, the distinction between speculators and hedgers is not always clear cut. Further, while dealers are not pure speculators, a certain amount of speculative activity by dealers contributes to liquidity and market efficiency. It is therefore difficult if not impossible to judge with any precision the proportion of activity that might be classified as speculative. There are nonetheless broad categories of market participants that might be identified as engaging in significant speculative activity.

OTC derivatives. For most over-the-counter derivatives products, the available data do not provide any hints as to the breakdown between speculative and hedging activity. A possible exception is the Bank for International Settlements (2010) statistics on credit default swaps, which break the data out by counterparty type. Table 1 shows the percentage of notional amounts by counterparty type; the bought and sold classifications reflect the reporting dealer's point of view. The majority of CDS notional amounts outstanding are with dealers; while some dealer transactions might be speculative, the majority are likely used to hedge other transactions. The "other" category, which includes hedge funds as well as special purpose vehicles, likely includes a substantial amount of speculative activity; the majority of this activity represents long positions by the counterparty and totals less than 10 percent of total notional.

Table 1: CDS by counterparty type, Dec. 2009 (%)

Counterparty type	Bought	Sold	Total
Dealers	69.4	71.2	54.2
Non-dealer banks, securities firms	20.0	19.4	30.4
Insurers	0.9	0.4	1.0
Other	6.4	6.0	9.5
Non-financial	3.2	3.0	4.8

Source: Bank for International Settlements, May 2010

Another source of evidence on speculation in OTC derivatives is the Depository Trust Clearing Corporation (DTCC) Trade Information Warehouse dataset for credit default swaps. As of July 23, 2010, total gross notional amount of CDS registered at DTCC was $25.0 trillion. Of this total, $14.6 trillion was single name CDS and $10.4 trillion was index or tranche CDS. But these gross notional amounts include a large number of offsetting trades: for single-name CDS, the $14.6 trillion gross notional amount nets down to a $1.2 trillion net notional amount, while for index and tranche CDS the $10.4 trillion gross notional amount nets down to a $1.1 trillion net notional amount. Assuming that dealer positions are largely flat, one can assume that the total $2.3 net notional amount, which is less than 10 percent of total gross notional, is divided between speculative and hedge positions. While it is not possible to give a more precise breakdown, it gives some indication of the upper limit of speculative activity.

Futures. In listed derivatives (futures) markets in the United States, the Commodity Futures Trading Commission issues the Commitment of Traders Report, which lists long and short interest by commercial and non-commercial market participants. Commercial traders are defined as those primarily engaged in hedging, while non-commercial traders are not classified as hedgers according to the CFTC's definition. Table 2 below shows net long or short position in number of contracts outstanding for commercial and non-commercial traders as well as for a third non-reporting category of traders below the size threshold. The table shows that, over time, hedgers and speculators can be either net long or net short.

Foreign exchange. Hafeez (2007) has attempted to estimate the percent of foreign currency market activity that is speculative in nature. Using Bank for International Settlements survey results on FX turnover as well as balance of payments data for the United States, Hafeez estimates that "profit seeking," that is, speculative, FX activity is about 25 percent of trading, although this estimate is subject to wide boundaries in both directions. He also finds that speculative activity appears to be declining in significance over time in relation to other forms of trading.

Table 2: Net long or short positions by trader type in selected commodities (thousands of contracts)

	May 19, 2009			December 8, 2009			May 18, 2010		
	Com.	Noncom.	Non-rep.	Com.	Noncom.	Non-rep.	Com.	Noncom.	Non-rep.
Copper	14.9	-19.0	4.1	-14.3	12.6	1.6	-4.0	7.2	-3.3
Crude oil	-107.1	94.0	13.1	-166.4	141.6	24.8	-158.0	134.9	23.2
Eurodollars	-652.1	555.8	96.3	-889.9	907.8	-17.9	-576.0	761.4	-185.4
Heating oil	-31.7	20.1	11.6	-39.0	25.8	13.2	-30.1	18.0	12.1
Natural gas	-1.3	-44.3	45.6	46.0	-75.9	29.9	65.7	-95.3	29.6

category of uninformed trader is hedgers, who trade in order to reduce their exposure to certain unwanted financial risks; hedging activity by its nature involves taking both long and short positions, depending on the underlying risk being hedged. Other categories of uninformed trader include investors, who seek income from deferring consumption, and borrowers, who seek to benefit from immediate availability of funds. Hedgers, investors, and borrowers—sometimes called "utilitarian traders"—all have in common that they do not normally expect to profit from the act of trading itself, but instead trade with other objectives in mind.[1]

Another category of uninformed trader is dealers, or market makers, who facilitate trading by others by holding themselves out as financial intermediaries willing to buy or sell at bid or offer prices. Unlike hedgers, investors, or borrowers, dealers expect to profit from trading as part of the intermediation services they provide. Although market making might yield some information that leads to profitable opportunities, dealers do not trade primarily on the basis of informational advantages and are therefore classified as uninformed traders.

Using the above framework in which speculators are informed traders, the following discussion will summarize the economic benefits that speculators provide to other market participants such as hedgers and dealers. The discussion will also cite some studies that provide evidence for those benefits. The following analysis will consider the benefits of speculative activity in three aspects of market performance, namely, liquidity, efficiency, and completeness.

Liquidity

There is no universally agreed definition of liquidity, but as a general matter a liquid market is one in which it is possible to transact immediately with minimum effect on price and minimum loss of value. Even when prices do change as the result of trading, in liquid markets they return quickly to their former levels. Liquidity is especially important to hedgers and other utilitarian traders, who are willing to pay a premium in order to have access to liquidity when they need it (Hafeez 2007).

Economic theory suggests that speculation is likely to enhance the liquidity of markets (Admati and Pfleiderer 1988). In support, empirical studies have shown that speculation, especially short selling, is generally associated with higher market liquidity (e.g., Charoenrook and Daouk 2005, Boehmer and Wu 2010). In order to understand the channels through which speculation affects liquidity, the following analysis will look at four dimensions of liquidity, that is, immediacy, cost, depth, and resiliency.

[1] In practice, the distinction between speculation and other types of trading is not always so clear cut. Some "opportunistic" hedgers, for example, are informed traders to the extent that they exercise discretion over the timing of hedges and the types of hedge instrument used.

Immediacy refers to how long it takes to transact at a given cost in a given size. Dealers, not informed speculators, are the primary source of immediacy in a market. Dealers are compensated in bid-offer spreads for providing immediacy, but their ability to provide immediacy is enhanced by engaging in occasional speculation (Demsetz 1968, Grossman and Miller 1988). Secondarily, the existence of other speculators provides additional immediacy to dealers.

Consider the case of a hedger that approaches a dealer to transfer an unwanted risk to the dealer by means of a swap transaction. As a market maker, the dealer commits to quoting prices at which it will transact. But if the dealer agrees to take on the risk from the hedger, the dealer will face the question of what to do with the transferred risk. Because the dealer does not necessarily have any informational advantage in bearing the risk, the dealer will likely hedge the risk using offsetting transactions with other dealers or in other markets. If hedging alternatives are readily available at reasonable cost, the dealer will probably agree to the transaction. But if it is not possible immediately to hedge the risk, the dealer must choose between agreeing or rejecting the transaction.

If a hedger wishes to hedge $10 million of exposure with a dealer, for example, but the dealer can immediately hedge only $6 million at an acceptable cost, the dealer might nonetheless agree to the deal. But if it does so, the dealer will have an unhedged—that is, speculative—exposure of $4 million. The benefit of the dealer's willingness to speculate that it provides immediate liquidity to the hedger; indeed, as part of its role as intermediary, the dealer has probably invested in the capacity to manage the exposure. After more extensive search, the dealer might uncover additional hedging opportunities, possibly from informed speculators hoping to profit from taking on the risk. The greater the number of such speculators, the greater the immediacy the dealer can provide.

Cost. A second dimension of liquidity is cost, which takes the form of the bid-offer spread; this is sometimes referred to as market width. The effect of speculation on bid-offer spreads shows up in the context of the "bilateral search" problem faced by financial market participants (Harris 2003). Consider, for example, a market in which there are only hedgers, possibly borrowers concerned with rising interest rates and investors concerned with falling rates. Without dealers, borrowers and investors would face the task of searching for each other and arranging transactions if their needs coincide. In such a market, dealers facilitate the hedging process by specializing in the search for hedgers and bringing them together. Because the search process can be costly, the dealer will need to be compensated for this via wider bid-offer spreads. If the market includes speculators, however, they will have incentives to enter the market to take advantage of the wide spreads and create more hedging alternatives for dealers. The presence of speculators consequently reduces dealers' search costs, which leads to lower bid-offer spreads.

Depth. A third dimension of liquidity is depth, which refers to the ability to transact in large size at a given price. The market microstructure literature has identified speculative value traders as an important source of depth. When hedgers and other uninformed traders demand liquidity, for example, their demands might cause prices to diverge from fundamental values. As prices diverge, however, value traders enter with speculative positions and offset the effect of the uninformed traders. In doing so, the value traders increase the depth of the market by making it possible for hedgers to transact in greater size.

Resiliency. A final dimension of liquidity is market resiliency, that is, the speed with which prices revert to their former levels in those instances that trading causes prices to move. As with depth, value traders are the primary source of resiliency because they enter a market whenever prices diverge from fundamental values. In a market with many speculators, demands by hedgers for liquidity will have little effect on prices.

Overall, the evidence suggests that speculation improves the liquidity of markets. It does so by helping dealers provide immediacy, by reducing bid-offer spreads, by providing depth to markets, and by making markets more resilient. By making markets more liquid, speculators provide important benefits to hedgers and other market participants.

Efficiency

Market efficiency refers to the degree to which market prices are informative, that is, reflect fundamental values. Whether or not one accepts the efficient market hypothesis that market prices incorporate all relevant information, it is reasonable to argue that speculation by value traders pushes markets toward greater efficiency. To the extent that prices diverge from fundamental values because of hedging and investing activity, value traders enter on the other side of the market and in the process bring prices back to their fundamental values. Short sellers are the classic informed value traders: when they suspect that a company's debt is mispriced, for example, they can either sell the debt short or buy protection in the form of credit default swaps. The short seller in such cases is often the bearer of bad news, and as a result is sometimes mistaken for the cause of a problem instead of the identifier. But the news is not always bad: value traders who believe that a company's prospects are better than implied in market prices can go long by either buying the debt or selling CDS protection. This type of value trading is consistent with one of the above definitions of speculation, that is, attempting to profit from taking on the risks of a price change that is not the result of any actions taken by the speculator.

Evidence that speculators help move prices toward fundamental values includes a study by Jones and Lamont (2002), who show that binding constraints on short sales lead to overpricing in equity markets. In addition, Lipkin and Avellaneda (2009) show that short sale restrictions lead to higher equity prices and volatilities.

Finally, Boehmer and Wu (2010) found that several measures of informational efficiency improved during periods when short sellers were more active. Further evidence comes from the activities of value traders, and especially of short sellers, in helping to prick price bubbles before they become destabilizing. One well-known case is Enron, for which value traders identified accounting and other anomalies even as the share price continued to rise (Chanos 2003). Another is the monoline insurers, for which value traders identified weaknesses in the firms' business models and questioned rating agency and market perceptions of the insurers' creditworthiness (Ackman 2002, Richard 2008).

To summarize, speculators make markets more efficient by helping move prices closer to fundamental values. In practical terms, this means that short sellers provide discipline against overpricing while speculative buyers help counteract unjustified drops in price. Even for those who question the efficient market hypothesis, speculation should generally improve the quality of information reflected in market prices and should be of particular value in letting air out of overinflated asset prices.

Market completeness

In formal economic theory, market completeness means that there is a market for every good (Flood 1991). More concretely, it means that those wishing to hedge a risk can find an interested party to take the other side. Such market completeness would be difficult if not impossible to achieve without speculators.

Market completeness applies over time as well as across locations and products. Holbrook Working (1931) described an example of market completion over time in the wheat futures market. Wheat is harvested mostly during one month of the year, but consumption of wheat extends over the entire year. In order to maintain a sustainable level of consumption over the year, markets can establish forward prices for wheat that create incentives to allocate wheat use efficiently. In theory, physical producers such as grain buyers and millers could negotiate prices at which they would be willing to store the wheat over the year instead of using it immediately. But limiting the market to physical producers would require that the producers bear the price risk of the wheat, a risk they might prefer not to bear. Bringing speculators into the market solves this problem by allowing producers to store the wheat while transferring the price risk to speculators. The result is more efficient allocation of risks over time.

Also using wheat futures markets as an example, Roger Gray (1967) described the role of speculators in market completion over locations. His study covered U.S. wheat futures markets in Chicago, Kansas City, and Minneapolis; the Chicago market was characterized by extensive speculative activity, while the Kansas City and Minneapolis markets were used primary by hedgers. The study showed that the Kansas City and Minneapolis markets "are able to absorb the hedging positions which come to them only because substantial speculation is transfused from Chicago" by means of arbitrage trades across markets.

Finally, an example of market completion over products would be credit default swaps, especially those on single names. A classic problem in banking has been the inability to hedge credit risk. In financial terms, a lender had an inherent long position in the borrower's credit but in most cases could not take an offsetting short position. Dealers helped solve this problem by intermediating between lenders seeking to go short and others seeking to go long. Investors, for example, might take a long position in a credit by selling protection in order to earn spread income. And speculators, including hedge funds, might enter as value traders, selling protection on credits they perceive as being undervalued in the hopes of unwinding the protection at a profit if spreads narrow. And still others might engage in various forms of arbitrage, in which they sell protection but then offset it by buying it on another credit they believe is mispriced. The result is more complete markets in which lenders and investors are able to hedge the credit risks they take on in the course of their normal business.

Conclusion

The above considerations suggest that speculation is a necessary part of efficiently functioning markets. In theory, a market could exist in which intermediaries match hedgers, investors, and borrowers with each other. But such a market would be costly and inefficient without the liquidity and price discovery provided by speculators hoping to profit from their investments in information. As discussed above, the news borne by speculators, especially short sellers is not always welcome. But the alternative is a world in which markets would function in a slow and costly manner.

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