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ARE BANKS' SPECULATIVE PROFITS  
AT THE EXPENSE OF TRADERS?

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ARE BANKS' SPECULATIVE PROFITS  
AT THE EXPENSE OF TRADERS? A REPLY

## Are Banks' Speculative Profits at the Expense of Traders? \*

In a recent article Schulmeister (1988) studied the use of technical analysis by banks in the pursuit of speculative profits in foreign exchange markets. He noted that such trading has consistently yielded banks large profits. He then poses the question: "Now, if banks... consistently win in this game, who then is the loser?" and continues: "The answer is simple: all those market participants who buy or sell foreign exchange for other reasons than short-term profit maximization from foreign exchange dealing itself, particularly traders of goods and services who... use foreign exchange for international payments rather than as a financial asset" (p. 356).

In this note I analyze critically the view that traders of goods and services "lose" when banks profit from currency speculation. I propose that, instead, these profits should be viewed as a return to a service which the banks as speculators provide to these traders. This service takes the form of more stable exchange rates through time.

### Speculative profits and stabilization

Friedman (1953) argued that speculators who consistently earn profits must stabilize the exchange rate. This conclusion is based on a simple idea. Profits can be made only by buying when the price is low and selling when it is high. Since

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\* A comment on STEPHAN SCHULMEISTER "Currency Speculation and Dollar Fluctuations", in this *Review*, 167, Dec. 1988, pp. 343-366.

purchases drive up prices and sales lower them, such activities reduce the magnitude of exchange rate fluctuations.<sup>1</sup>

The validity of Friedman's proposition has been challenged in a series of papers during the 1950s and 1960s, the most prominent of which were Baumol (1957), Telser (1959) and Stein (1961). The controversy is reviewed and evaluated by Sohmen (1969).

Recently, the subject has been raised again by Dornbusch and Frankel (1988) who claim "The modern theory of rational stochastic speculative bubbles has all but demolished Friedman's claim that investors who bet on destabilizing expectations will lose money. In a rational speculative bubble, investors lose money if they *don't go* along with the trend" (page 165, italics in original). DeLong *et al.* (1987) claim that speculation can be profitable even if trading follows irrelevant noise.

Most economists find appealing the simple logic of the argument made by Friedman and Mill. The more complicated models critical of the basic proposition are logically correct.

However, their intuitive appeal is more limited since they tend to be based on a large set of restrictive assumptions about behaviour and the formation of expectations. Since both propositions are theoretical and logically correct, it is not possible to consider one to be more realistic than the other. Such a choice can be made only after the different models have been subjected to empirical tests. Unfortunately, neither theories have been tested and probably never will be because of both the nature of the models and the absence of relevant data.

In the following analysis I assume that consistent speculative profits are evidence that the speculators have stabilized exchange rates. This assumption of course does not say that speculation always is profitable. The profitability of speculation is an empirical question which will be examined next.

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<sup>1</sup> One of the earliest statements of this proposition is found in JOHN STUART MILL (1901) and quoted by SOHMEN (1969) which is worth quoting as an elaboration of Friedman's position:

«For if often happens that speculative purchases are made in the expectation of some increase of demand, or deficiency of supply, which after all does not occur, or not to the extent which the speculator expected. In that case the speculation, instead of moderating fluctuations, has caused a fluctuation of price which otherwise would not have happened, or aggravated one which would. But in that case the speculation is a losing one, to the speculators collectively, however much some individuals may gain by it... The operations, therefore, of speculative dealers, are useful to the public whenever profitable to themselves; and though they are sometimes injurious to the public, by heightening the fluctuations which their more usual office is to alleviate, yet whenever this happens the speculators are the greatest losers" (Book IV, Chapter ii, section 5).

## Do banks make consistent speculative profits?

It is widely known that the demise of the Bretton Woods system in 1972-73 increased the size of the exchange rate fluctuations, which were the norm during the preceding decade. Many banks had failed to adjust their internal control mechanisms to suit the new environment. As a result, foreign exchange departments of many banks were able to speculate and some even engaged in fraudulent schemes, trying to profit from the large exchange rate fluctuations. While much of this speculation was profitable, some of it resulted in large losses. Two major banks, the Herrstatt Bank of Germany and the Franklin Bank of New York became insolvent as a result of very large losses incurred by their foreign exchange departments.

After these experiences, banks installed strict control systems on their foreign exchange departments. In particular, exchange rate exposure was limited to small sums. As a result, overall speculative activities in foreign exchange market were reduced substantially and some commentators like McKinnon (1976) claimed that there was a shortage of speculation in the market.

However, the foreign exchange departments of banks were able to earn high rates of return on the funds which banks had set aside for this purpose. This success eventually resulted in an increased availability of funds used by these departments for speculation. During the 1980s, they have made significant contributions to the overall profits of banks. These facts are documented by Goodhart (1987) and Schulmeister (1988). Through personal contacts I have learned that major Canadian banks have committed substantial sums to currency speculation at both the national headquarters and regional centres engaged in currency trading. Profits from this activity are variable but consistently high. Only few individuals have the personality and acumen to meet the demands of the occupation of currency trading and speculation.

Schulmeister (1988) makes much of the use of technical trading rules by currency speculators of banks. However, successful traders use technical information supplied by chartists as only one of many inputs into their decision making process. The most successful traders appear to have an instinct for the use of information which distinguishes them from the rest and which cannot be modelled.<sup>2</sup> At any rate, for the present purposes of analysis it does not matter whether foreign exchange profits are earned as a result of intuition or of advice from chartists, economists analyzing fundamentals or psychologists studying public opinion. The main point is that the foreign exchange departments of banks appear on to make consistent profits.

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<sup>2</sup> Seeing opportunities where others do not appear to characterize successful individuals in all occupations involving complicated intellectual tasks. Thus, the most successful chess players in the world are alleged to have a sense for the game which cannot be modelled and which still permits them to beat the best computer chess systems. The best and most original economists also have such an ability.

Dornbusch and Frankel (1988) note that profits of the foreign exchange departments of banks are due to the spread between buying and selling rates of foreign exchange as well as speculation. Unfortunately, banks do not provide information which permit estimates of the relative size of the two sources of income. Dornbusch and Frankel note that the very large interbank currency trading of recent years are consistent with the view that almost all incomes are due to the brokerage activities and none from speculation. I reject this conjecture on the grounds of direct information from the banks noted by Schulmeister and revealed in personal interviews. If there were no profits, currency trading departments would not have access to substantial balances dedicated to speculation.

### Speculators serve traders

Using the preceding analysis for justification I assume that consistently profitable speculation increases exchange rate stability and that the foreign exchange departments of banks consistently earn profits from such speculation. I now turn to an examination of the question whether such speculation occurs "at the expense" of traders.

To analyze this question consider a world in which there are initially only two groups of foreign exchange market participants. The first is made up of banks which operate both as brokers and speculators. The second consists of the importers and exporters of goods, services and long-term assets, hereafter referred to simply as traders. These traders use the foreign exchange market only to convert foreign into domestic currency the proceeds and obligations which result from their economic activities.

Let us consider first conditions under which banks do not speculate and serve only as brokers. As such they match the global demand for and supply of currencies originating with the traders. The spread between the buying and selling rates of foreign exchange produces the banks' income. It can be measured in principle as the ratio of income over the total volume of transactions. Under these conditions, fluctuations in the exchange rate are due to influences exerted by seasonal, cyclical and random forces as well as governments' policies on the competitiveness of industry in different countries.

The exchange rate instability existing under these conditions affects the variance of the returns from foreign trading activities.<sup>3</sup> According to conventional

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<sup>3</sup> Forward exchange rate cover eliminates the uncertainty associated with foreign trade, but it cannot eliminate the instability of the earnings from trade. On the other hand, internationally diversified markets can raise the stability of global earnings above those from domestic activities alone. This fact may well be responsible for the observation that the large exchange rate fluctuations during the 1970s and 1980s have had not measurable detrimental effect on the level of international trade. In this note I stay with the traditional model which does not consider systematically the concepts of risk and diversification in trade.

theory, welfare is a decreasing function of instability in exchange rates and returns from trading. In a sense, exchange rate fluctuations represent a tax on international trade and therefore decrease the levels of international trade and specialization.

Next consider a world in which banks continue to act as brokers but in addition engage in consistently profitable currency speculation. Under these conditions, the sum of banks' income from brokerage and speculation divided by the total volume of trade represents the average spread between the buying and selling prices of currency. This spread of necessity is larger than it is in the absence of profitable speculation. In our model the banks' extra income comes from traders, reflecting Schulmeister's view that the speculative profits are "at the expense" of the traders.

However, this view neglects the fact that the speculation results in greater stability of the exchange rate through time. In a fundamental sense, the speculative profits of banks are traders' payment in return for the benefits of providing more stable exchange rates. Traders purchase this service from banks rather than produce it themselves through their own speculation presumably because there are economies of specialization and scale enjoyed by banks. Pareto optimality in an uncertain world is attained when there is equality between the risk-adjusted marginal productivity of traders' capital on the one hand and of resources in the banks' speculative activity on the other.

The preceding model may be extended to cover the possibility that there are foreign exchange speculators other than banks. These speculators might be private wealthholders, central banks and some traders. It is useful to assume that a certain proportion of these speculators are like the banks and consistently earn profits. For the present purposes of analysis it is useful to subsume them in the category of banks and to focus the analysis on those in the group who lose consistently.

It is clear that such speculators cannot stay in the business for long. If they are private individuals, they have only a finite net worth. Individuals who work for traders or financial intermediaries tend to be replaced quickly or they bankrupt the firms for which they work. The exception to this rule are central banks, though they too are subject to financial controls by their own management, treasury departments and politicians.<sup>4</sup> It has been argued that, in spite of this self-limiting tendency of losing speculation, the activity remains sub-

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<sup>4</sup> It is difficult to obtain empirical information on the profitability of central bank speculation in the foreign exchange market. This is due to the fact that most central banks have very large stocks of open positions, including holdings of gold. Estimates of returns from speculation are influenced greatly by assumptions made about the future value of these large stocks. The annual gains and losses from actual transactions are relatively small in comparison with those from the stocks. In practice, these problems make estimates of returns extremely sensitive to the period under consideration.

stantial because losers are constantly replaced by new entrants into the activity. It is impossible to assess the empirical merit of this argument and the following analysis considers the implications of the existence of such money-losing and destabilizing speculation.

Banks which earn consistent speculative profits make gains at the expense of that group. It is possible that the group's losses are more or less than the banks' profits from speculation. Under either of these conditions, banks still provide a stabilizing service to traders since they counteract the destabilizing effects of the losing speculators. In the absence of the banks' activities, exchange rate variance would be greater. All of the arguments made above about the benefits of the profitable speculation remain valid.

### Summary and conclusions

In a recent study Schulmeister noted that banks which follow technical trading rules have consistently made profits from currency speculation. He suggested that these profits occurred at the expense of exporters and importers of goods and services. This conclusion is misleading. Under the assumption that the consistent profits of banks result in more stable exchange rates, the speculative earnings of the banks in fact represent a payment by traders for increased exchange and earnings stability. Under these conditions, the speculative activities of banks increase overall economic efficiency and welfare since they raise the risk-adjusted returns to and create higher levels of international trade and specialization. These welfare gains exist even if some or all of the banks' gains are at the expense of a floating population of speculators that lose consistently. In the absence of the stabilizing activities of the banks, exchange rate fluctuations would be even larger.

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## Are Banks' Speculative Profits at the Expense of Traders? A Reply

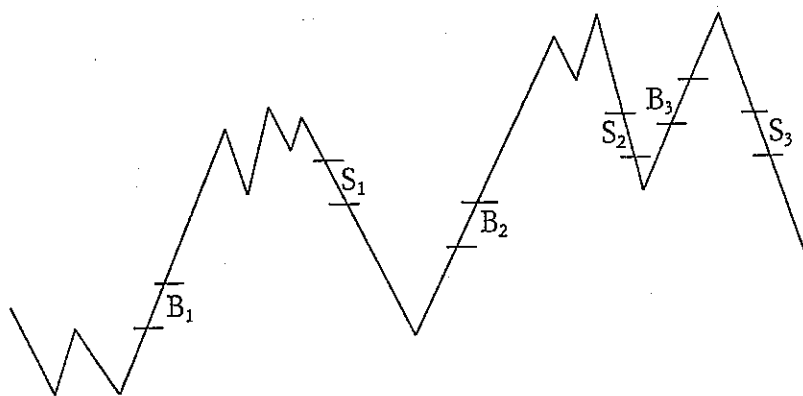
In his note Prof. Grubel criticizes the view "that traders of goods and services 'lose' when banks profit from currency speculation". He proposes, instead, "that these profits should be viewed as a return to a service which the banks as speculators provide to these traders. This service takes the form of more stable exchange rates through time".

This proposition is based upon one central assumption, namely, "that consistent speculative profits of banks are evidence that the speculators have stabilized exchange rates". Grubel thus follows the famous argument by Friedman, that consistently profitable speculation necessarily stabilizes the exchange rate movements. Grubel concedes that there also exist theoretical models where speculation is profitable and destabilizing at the same time. "However, their intuitive appeal is more limited since they tend to be based on a large set of restrictive assumptions about behavior and the formation of expectations" (as opposed to the simple and therefore appealing logic of Friedman's argument). Grubel concludes: "Since both propositions are theoretical and logically correct, it is not possible to consider one to be more realistic than the other. Such a choice can be made only after the different models have been subjected to empirical tests. Unfortunately, neither theories have been tested and probably never will be because of the nature of the models and the absence of relevant data".

I agree completely with Prof. Grubel that the question of whether profitable currency speculation stabilizes or destabilizes the exchange rate movements can only be answered on empirical grounds. One purpose of my study therefore is to provide empirical evidence which may help to discriminate between the two alternatives. I did so by testing the performance of a specific type of currency speculation, namely, those trading systems, that are based on technical analysis. Such tests can help to discriminate between the two alternative views for two

reasons. First, these techniques are widely and increasingly used in practice. Second, "technical" currency speculation is by its essence destabilizing. In order to fully understand the second point one has keep in mind two characteristics of technical trading systems. First, technical speculation systems are trend-following, *i.e.*, they produce buy signals only when an upward price movement has already taken off and sell signals only when the prices are already falling. Second, due to their technical character technical speculation deliberately ignores market fundamentals. Whether or not an equilibrium exchange rate exists is completely irrelevant for technical currency trading. Such speculators don't think in terms of an equilibrium exchange rate (level) determined by market fundamentals but in terms of disequilibrium exchange rate movements or "runs" (*i.e.*, monotonic or almost monotonic price paths), which they try to exploit profitably.

How does the use of technical currency speculation impact upon exchange rate dynamics? Once an upward (downward) exchange rate movement has gained some momentum technical trading systems begin to produce buy (sell) signals. Since there exist "faster" and "slower" trading systems (depending on the sensibility of the trading system with respect to changes in the direction of exchange rate movements), any relatively persistent upward or downward run is followed by a range of buy and sell signals.<sup>1</sup> A simple chart stylizes these facts (B...buy range, S...sell range):



The actual execution of the trading signals necessarily steepens and extends the current exchange rate movement and might in many cases lead to the development of a persistent exchange rate run which would not have occurred otherwise. In other words: The use of technical trading systems increases the instability of exchange rates by generating or strengthening runs which in turn provide the basis for the profitability of technical currency speculation.

Whereas the use of technical currency speculation is necessarily destabilizing, it is not necessarily profitable (compare, *e.g.*, the ranges  $S_2/B_3$  and

<sup>1</sup> LUKAC, BRORSEN and IRWIN (1988) showed that technical trading systems are significantly more often on the same side of the market than would be randomly expected.

$B_3/S_3$  in the chart). Tests of the most popular systems like moving average and momentum models for the DM/\$ exchange rate reveal, however, that many of them produce extra profits not only over the overall period since 1973, but also during every sub-period of 18 months. This result suggests that technical (and consequently destabilizing) currency speculation is widely used, at least as *one* basis for trading decisions. There are two reasons for such a conclusion. First, it seems extremely unplausible that these high profit opportunities remain unexploited in such a well informed market.<sup>2</sup> Second, the frequent occurrence of exchange rate runs would remain unexplained if there were no trend-following and consequently trend-extending speculation at work.

Can the results of the technical trading rule tests be reconciled with the proposition that speculation in the foreign exchange market is predominantly stabilizing? One could argue, *e.g.*, that the frequent occurrence of exchange rate runs represents mainly a statistical curiosity which might be profitably exploited by some "noise traders". These "irrational" agents represent, however, only a minority in the market place, so that their activities do not impact significantly upon exchange rate dynamics. Instead, the great majority of the market agents behave "rationally" in the sense of Friedman, thereby stabilizing exchange rate fluctuations. But if this is the case, which pattern of exchange rate dynamics should we expect?

Rational speculators buy a currency whenever its exchange rate lies below its equilibrium level as determined by the "fundamentals" and sell when the contrary is the case. If new information concerning the fundamentals change the expected equilibrium exchange rate, rational speculators would drive the actual rate almost instantaneously towards its new equilibrium level (given the nearly perfect conditions in the foreign exchange market). Furthermore, one should expect "news" concerning the fundamentals to be distributed randomly over time, so that the actual exchange rate should follow a random walk. In such a world systematically profitable speculation that is based only on the information contained in past prices would not be possible. This is nothing else than the proposition that the foreign exchange market is at least weakly efficient (Fama, 1970).

The actual pattern of exchange rate dynamics, however, differs completely from this description of a world where rational and stabilizing currency speculation dominates the market process. First, actual exchange rate fluctuations are characterized by a sequence of persistent runs instead of instantaneous "jumps" towards a presumably new equilibrium. Second, these runs occur frequently enough so that simple trend-following and consequently destabilizing speculation techniques (which use only the information contained in past prices) turn out to be systematically profitable. Hence, the foreign exchange market cannot be considered weakly efficient. Third, the exchange rate does not follow a

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<sup>2</sup> The increasing importance of technical currency speculation is also confirmed by surveys among banks and other professional foreign exchange traders (see SCHULMEISTER, 1987).

random walk, the degree of rejection increasing both over time (particularly during the 1980s) as well as with higher frequency data, such as daily data.<sup>3</sup> Fourth, the exchange rate does not oscillate around its theoretical equilibrium path (as determined by purchasing power parity and uncovered interest parity), but deviates persistently from it. These medium-term overappreciations (overdepreciations) of the dollar may be due to the cumulative effect of short-term oriented currency speculation: Over several years, upward runs last on average some days longer than the counter-movements, so that the dollar (over)appreciates in a stepwise process (and *vice versa* in the case of a medium-term overdepreciation). This phenomenon can be explained by the existence of a medium-term expectational bias in favor or against the dollar. If a positive bias prevails currency dealers hold a long dollar position some days longer than a short dollar position which causes the upward runs to last longer than the counter-movements (the opposite holds true if the market expectations are biased against the dollar).<sup>4</sup>

There must be, however, one class of speculators in the market, who do stabilize exchange rate fluctuations insofar as they prevent exchange rate runs from becoming explosive bubble paths (this would occur if there were only trend-following speculators operating in the market). These speculators exploit their knowledge about the behavior of the trend-following speculators (be it technical analysts or more traditional "bandwagonists"). They know that the longer a run lasts the weaker becomes the bandwagon effect and the stronger becomes the cash-in effect. Consequently, these speculators try to figure out when a current run is "mature" for "bursting". In such a situation of an "overbought" ("oversold") dollar these types of speculators attempt to anticipate those "news" which might trigger off a "tilt" of the run. Hence, they buy near

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<sup>3</sup> In a similar study on stock prices we find that the rejection of the random walk hypothesis is again much stronger with hourly data than with daily data (GOLDBERG and SCHULMEISTER, 1989). This reflects the fact that the time horizon of trend-following speculation techniques has become shorter over time (in other words, the frequency of the price data processed by technical trading systems has increased). This development is facilitated by the improvement of computer networks on the one hand (especially in the strongly expanding futures markets), and the growth of software for the use of technical trading systems on the other hand (see the annual August-edition of *Euromoney* for a documentation of the most recent trends). In interviews with professional traders I was informed that the "fastest" speculation systems now in use check every 9.3 seconds whether an open position should be rolled over or closed or changed to a counter-position (these fully computerized trading systems change open positions up to 60 times per day). The tendency towards the use of "faster" speculation systems can explain why the intra-day volatility of exchange rates has increased so drastically over the last few years. In the case of the stock market the use of "fast" technical trading systems was an important factor for the specific way in which the crash of October 19, 1987 developed (see GOLDBERG and SCHULMEISTER, 1989).

<sup>4</sup> The fact that agents in the foreign exchange market do not form their expectations according to the theoretical equilibrium conditions is also documented by empirical surveys; they reveal that exchange rate expectations of market agents deviate even further from the values implied by uncovered interest parity than the actually observed rates do (FRANKEL and FROOT, 1987).

the expected end of a downward run and sell near the expected end of an upward run. If these "anticipating" speculators come to similar conclusions concerning the "matureness" of a current run, the aggregate outcome of their individual trading decisions can actually trigger off a "bursting" of the run. Hence, this type of speculation also implies a self-fulfilling feed-back mechanism. Though in effect stabilizing, these "anticipating" speculators are not at all "rational". This is so because they base their decisions not on the equilibrium conditions of the fundamentals, but on the "psychology of the market". These traders can therefore be called speculators of the "second degree" in the sense of Keynes' famous beauty contest example since they don't base their decisions on what they themselves believe, but on what "most nearly corresponds to the average preferences of the competitors as a whole" (Keynes, 1936, p. 156).<sup>5</sup> Rational speculators, by contrast, basing their decisions on the fundamental equilibrium conditions would have consistently lost money, *i.e.* during the 1980s (betting on either purchasing power parity or uncovered interest parity would have been a disaster).<sup>6</sup>

To summarize: The empirical evidence suggests that the foreign exchange market is increasingly influenced by two types of speculation. The first type is purely trend-following like all trading systems based on technical analysis. These systems extend or even generate persistent exchange rate runs which they exploit profitably at the same time. Because technical trading is only trend-following and ignores all notions of equilibrium or fundamentals this type of speculation has to be considered destabilizing. The second type of speculation aims at anticipating changes in the direction of exchange rate runs. This type of speculation is based on the "psychology of the market", in particular on the experience that the probability of the "bursting" of a run increases with its length. This speculation of the "second degree" in the sense of Keynes can be considered stabilizing insofar as it prevents exchange rate runs from becoming explosive price paths, *i.e.*, bubbles. This second type of speculation does, however, depend on the actual operation of the first destabilizing type: only if the market fluctuates in the form of persistent runs does the speculation of the "second degree" make sense. At the same time the first type of speculation also depends on the second type for a trend-following currency trader can in practice only exist if the exchange rate does not explode. Hence, both types of speculation constitute a system which as a whole has to be considered destabilizing

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<sup>5</sup> Keynes describes explicitly speculators of the third and higher degrees: "We have reached the third degree where we devote our intelligences to anticipating what average opinion expects the average opinion to be. And there are some, I believe, who practise the fourth, fifth and higher degrees" (KEYNES, 1936, p. 156).

<sup>6</sup> BILSON and HSIEH (1987) have even shown that betting systematically against the interest parity condition would have yielded high extra profits. FRANKEL (1988) demonstrated convincingly that the persistent deviations of the exchange rate from the interest parity condition can also not be explained by a time-varying risk premium.

since it generates exchange rate runs. The fact that such a system keeps these runs within certain limits does not qualify it as stabilizing. In short: This system of currency speculation destabilizes the exchange rate in the first place but it also provides a mechanism that moderates the degree of this destabilization. Both interdependent types of speculation do not operate on the basis of either the existence or the knowledge of fundamentally determined equilibrium exchange rates. They are therefore considered "irrational" by traditional exchange rate theorists. But, "rational" currency speculation would have been consistently unprofitable and thus self-eliminating. Hence, the theoretically "rational" speculator seems to be "irrational" in practice, whereas the so-called "noise-trader" turns out to be a typical "homo oeconomicus" insofar as he earns at least abnormally high profits. On empirical grounds, Friedman's argument seems therefore to be misplaced. One of the major tasks facing the economics and finance profession is to provide a satisfying theoretical explanation of the phenomenon of destabilizing yet profitable speculation.

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