1

Reflexivity in the Stock Market

COPYRIGHTED MATERIAL

In trying to develop a theory of reflexivity, I shall start with the stock market. For one thing, it is the market I am most familiar with: I have been a professional investor for more than twenty-five years. For another, the stock market provides an excellent laboratory for testing theories: changes are expressed in quantitative terms and the data are easily accessible. Even the participants' views are usually available in the form of brokers' reports. Most important, I have actually tested my theory in the stock market and I have some interesting case studies to present.

As I mentioned in the Introduction, I did not develop my ideas on reflexivity in connection with my activities in the stock market. The theory of reflexivity started out as abstract philosophical speculation and only gradually did I discover its relevance to the behavior of stock prices. I was singularly unsuccessful in formulating my theory at the level of abstraction at which I conceived it: my failure as a philosopher stands in stark contrast with my career as an investment professional. I hope that by presenting my ideas in the reverse order from the one in which I arrived at them I may be able to avoid getting lost in arcane abstractions.

There is yet another reason why the stock market may provide the best entry point for the study of reflexive phenomena. The stock market comes as close to meeting the criteria of perfect competition as any market: a central marketplace, homogeneous products, low transaction

and transportation costs, instant communications, a large enough crowd of participants to ensure that no individual can influence market prices in the ordinary course of events, and special rules for insider transactions as well as special safeguards to provide all participants with access to relevant information. What more can one ask for? If there is any place where the theory of perfect competition ought to be translated into practice, it is in the stock market.

Yet there is little empirical evidence of an equilibrium or even a tendency for prices to move toward an equilibrium. The concept of an equilibrium seems irrelevant at best and misleading at worst. The evidence shows persistent fluctuations, whatever length of time is chosen as the period of observation. Admittedly, the underlying conditions that are supposed to be reflected in stock prices are also constantly changing, but it is difficult to establish any firm relationship between changes in stock prices and changes in underlying conditions. Whatever relationship can be established has to be imputed rather than observed. I intend to use the theory of reflexivity to criticize the preoccupation of economic theory with the equilibrium position. What better example could I find than the stock market?

Existing theories about the behavior of stock prices are remarkably inadequate. They are of so little value to the practitioner that I am not even fully familiar with them. The fact that I could get by without them speaks for itself.

Generally, theories fall into two categories: fundamentalist and technical. More recently, the random walk theory has come into vogue; this theory holds that the market fully discounts all future developments so that the individual participant's chances of over- or underperforming the market as a whole are even. This line of argument has served as theoretical justification for the increasing number of institutions that invest their money in index funds. The theory is manifestly false—I have disproved it by consistently outperforming the averages over a period of twelve years. Institutions may be well advised to invest in index funds rather than making specific investment decisions, but the reason is to be found in their substandard performance, not in the impossibility of outperforming the averages.

Technical analysis studies market patterns and the demand and supply of stocks. It has undoubted merit in predicting probabilities but not the actual course of events. For the purposes of this discussion it is of no particular interest, because it has little theoretical foundation other

than the assertions that stock prices are determined by their supply and demand and that past experience is relevant in predicting the future.

Fundamental analysis is more interesting because it is an outgrowth of equilibrium theory. Stocks are supposed to have a true or fundamental value as distinct from their current market price. The fundamental value of a stock may be defined either in relation to the earning power of the underlying assets or in relation to the fundamental value of other stocks. In either case, the market price of a stock is supposed to tend toward its fundamental value over a period of time so that the analysis of fundamental values provides a useful guide to investment decisions.

The important point about this approach is that the connection between stock prices and the companies whose stocks are traded is assumed to be in one direction. The fortunes of the companies determine—however belatedly—the relative values of the various stocks traded in the stock market. The possibility that stock market developments may affect the fortunes of the companies is left out of account. There is a clear parallel with the theory of price where the indifference curve determines the relative amounts consumed, and the possibility that the market may influence the indifference curve is disregarded. The parallel is not accidental: the fundamentalist approach is based on the theory of price. But the omission is more glaring in the stock market than in other markets. Stock market valuations have a direct way of influencing underlying values: through the issue and repurchase of shares and options and through corporate transactions of all kinds—mergers, acquisitions, going public, going private, and so on. There are also more subtle ways in which stock prices may influence the standing of a company: credit rating, consumer acceptance, management credibility, etc. The influence of these factors on stock prices is, of course, fully recognized; it is the influence of stock prices on these factors that is so strangely ignored by the fundamentalist approach.

If there are any glaring discrepancies between prevailing stock prices and fundamental values, they are attributed to future developments in the companies concerned that are not yet known but are correctly anticipated by the stock market. Movements in stock prices are believed to precede the developments that subsequently justify them. How future developments ought to be discounted is the subject of an ongoing debate, but it is presumed that the market is doing the job correctly even if the correct method cannot be theoretically established.

This point of view follows naturally from the theory of perfect competition. It is summed up in the assertion that "the market is always right." The assertion is generally accepted, even by people who do not put much faith in fundamental analysis.

I take a totally opposite point of view. I do not accept the proposition that stock prices are a passive reflection of underlying values, nor do I accept the proposition that the reflection tends to correspond to the underlying value. I contend that market valuations are always distorted; moreover—and this is the crucial departure from equilibrium theory—the distortions can affect the underlying values. Stock prices are not merely passive reflections; they are active ingredients in a process in which both stock prices and the fortunes of the companies whose stocks are traded are determined. In other words, I regard changes in stock prices as part of a historical process and I focus on the discrepancy between the participants' expectations and the actual course of events as a causal factor in that process.

To explain the process, I take the discrepancy as my starting point. I do not rule out the possibility that events may actually correspond to people's expectations, but I treat it as a limiting case. Translating this assertion into market terms, I claim that market participants are always biased in one way or another. I do not deny that markets have a predictive or anticipating power that seems uncanny at times, but I argue that it can be explained by the influence that the participants' bias has on the course of events. For instance, the stock market is generally believed to anticipate recessions; it would be more correct to say that it can help to precipitate them. Thus I replace the assertion that markets are always right with two others:

1. Markets are always biased in one direction or another.
2. Markets can influence the events that they anticipate.

The combination of these two assertions explains why markets may so often appear to anticipate events correctly.

Using the participants' bias as our starting point, we can try to build a model of the interaction between the participants' views and the situation in which they participate. What makes the analysis so difficult is that the participants' views are part of the situation to which they relate. To make any sense of such a complex situation, we need to simplify it. I introduced a simplifying concept when I spoke of the participants'

bias. Now I want to take the argument a step further and introduce the concept of a prevailing bias.

Markets have many participants, whose views are bound to differ. I shall assume that many of the individual biases cancel each other out, leaving what I call the "prevailing bias." This assumption is not appropriate to all historical processes but it does apply to the stock market and to other markets as well. What makes the procedure of aggregating individual perceptions legitimate is that they can be related to a common denominator, namely, stock prices. In other historical processes, the participants' views are too diffuse to be aggregated and the concept of a prevailing bias becomes little more than a metaphor. In these cases a different model may be needed, but in the stock market the participants' bias finds expression in purchases and sales. Other things being equal, a positive bias leads to rising stock prices and a negative one to falling prices. Thus the prevailing bias is an observable phenomenon.

Other things are, of course, never equal. We need to know a little more about those "other things" in order to build our model. At this point I shall introduce a second simplifying concept. I shall postulate an "underlying trend" that influences the movement of stock prices whether it is recognized by investors or not. The influence on stock prices will, of course, vary, depending on the market participants' views. The trend in stock prices can then be envisioned as a composite of the "underlying trend" and the "prevailing bias."

How do these two factors interact? It will be recalled that there are two connections at play: the participating and the cognitive functions. The underlying trend influences the participants' perceptions through the cognitive function; the resulting change in perceptions affects the situation through the participating function. In the case of the stock market, the primary impact is on stock prices. The change in stock prices may, in turn, affect both the participants' bias and the underlying trend.

We have here a reflexive relationship in which stock prices are determined by two factors—underlying trend and prevailing bias—both of which are, in turn, influenced by stock prices. The interplay between stock prices and the other two factors has no constant: what is supposed to be the independent variable in one function is the dependent variable in the other. Without a constant, there is no tendency toward equilibrium. The sequence of events is best interpreted as a process of historical change in which none of the variables—stock

prices, underlying trend, and prevailing bias—remains as it was before. In the typical sequence the three variables reinforce each other first in one direction and then in the other in a pattern that is known, in its simplest form, as boom and bust.

First, we must start with some definitions. When stock prices reinforce the underlying trend, we shall call the trend self-reinforcing; when they work in the opposite direction, self-correcting. The same terminology holds for the prevailing bias: it can be self-reinforcing or self-correcting. It is important to realize what these terms mean. When a trend is reinforced, it accelerates. When the bias is reinforced, the divergence between expectations and the actual course of future stock prices gets wider and, conversely, when it is self-correcting, the divergence gets narrower. As far as stock prices are concerned, we shall describe them simply as rising and failing. When the prevailing bias helps to raise prices we shall call it positive; when it works in the opposite direction, negative. Thus rising prices are reinforced by a positive bias and falling prices by a negative one. In a boom/bust sequence we would expect to find at least one stretch where rising prices are reinforced by a positive bias and another where falling prices are reinforced by a negative bias. There must also be a point where the underlying trend and the prevailing bias combine to reverse the trend in stock prices.

Let us now try to build a rudimentary model of boom and bust. We start with an underlying trend that is not yet recognized—although a prevailing bias that is not yet reflected in stock prices is also conceivable. Thus, the prevailing bias is negative to start with. When the market participants recognize the trend, this change in perceptions will affect stock prices. The change in stock prices may or may not affect the underlying trend. In the latter case, there is little more to discuss. In the former case we have the beginning of a self-reinforcing process.

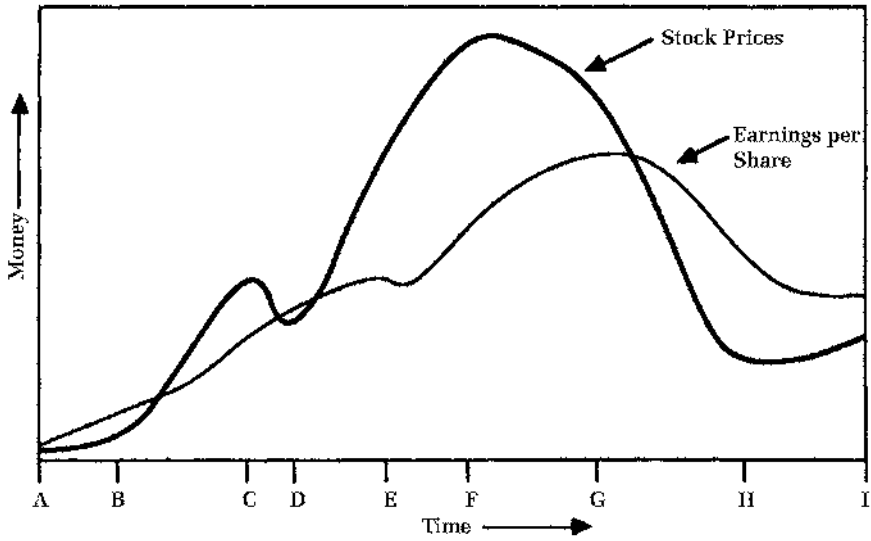
The enhanced trend will affect the prevailing bias in one of two ways: it will lead to the expectation of further acceleration or to the expectation of a correction. In the latter case, the underlying trend may or may not survive the correction in stock prices. In the former case, a positive bias develops causing a further rise in stock prices and a further acceleration in the underlying trend. As long as the bias is self-reinforcing, expectations rise even faster than stock prices. The underlying trend becomes increasingly influenced by stock prices and the rise in stock prices becomes increasingly dependent on the prevailing bias, so that both the underlying trend and the prevailing bias become

increasingly vulnerable. Eventually, the trend in prices cannot sustain prevailing expectations and a correction sets in. Disappointed expectations have a negative effect on stock prices, and faltering stock prices weaken the underlying trend. If the underlying trend has become overly dependent on stock prices, the correction may turn into a total reversal. In that case, stock prices fall, the underlying trend is reversed, and expectations fall even further. In this way, a self-reinforcing process gets started in the opposite direction. Eventually, the downturn also reaches a climax and reverses itself.

Typically, a self-reinforcing process undergoes orderly corrections in the early stages, and, if it survives them, the bias tends to be reinforced, and is less easily shaken. When the process is advanced, corrections become scarcer and the danger of a climactic reversal greater.

I have sketched out a typical boom/bust sequence. It can be illustrated by two curves that follow more or less the same direction. One represents stock prices, and the other, earnings per share. It would be natural to envision the earnings curve as a measure of the underlying trend, and the divergence between the two curves as an indication of the underlying bias. The relationship is much more complex. The earnings curve incorporates not only the underlying trend but also the influence of stock prices on that trend; the prevailing bias is expressed only partially by the divergence between the two curves—partially it is already reflected in those curves. Concepts that are only partially observable are extremely difficult to work with; that is why we have chosen variables that can be observed and quantified—although, as we shall see later, the quantification of earnings per share can be very misleading. For present purposes, we shall assume that the "fundamentals" in which investors are interested are properly measured by earnings per share.

A typical path for the two curves may be as follows. (See the figure on page 56.) At first, recognition of an underlying trend is lagging but the trend is strong enough to manifest itself in earnings per share (AB). When the underlying trend is finally recognized, it is reinforced by rising expectations (BC). Doubts arise, but the trend survives. Alternatively, the trend waivers but reasserts itself. Such testing may be repeated several times, but here I show it only once (CD). Eventually, conviction develops and it is no longer shaken by a setback in the earning trend (DE). Expectations become excessive, and fail to be sustained by reality (EF). The bias is recognized as such and expectations are lowered (FG).



Stock prices lose their last prop and plunge (G). The underlying trend is reversed, reinforcing the decline (GH). Eventually, the pessimism becomes overdone and the market stabilizes (HI).

It should be emphasized that this is only one possible path that results from the interplay of a single underlying trend and a prevailing bias. There could be more than one trend at work and the prevailing bias could have many nuances, so that the sequence of events might require a totally different representation.

A few words about the theoretical construction of the model may be in order. We are interested in the interplay between the participants' bias and the actual course of events. Yet the participants' bias is not directly represented in our model; both curves denote the actual course of events. The prevailing bias is partially incorporated in the two curves and partially denoted by the divergence between them.

The great merit of this construction is that it uses variables that can be quantified. Stock prices serve as a convenient proxy for the situation to which the participants' bias relates. In other historical processes the situation that is interconnected with the participants' perception by the cognitive and participating functions is more difficult to identify and impossible to quantify. It is the availability of a

convenient proxy that renders the stock market such a useful laboratory for studying reflexivity.

Unfortunately, the model offers only a partial explanation of how stock prices are determined. The concept of an underlying trend has been introduced as a placeholder term, to denote changes in the "fundamentals." What the fundamentals are has not been defined. Even the question of how the fundamentals are to be measured has not been answered. Earnings, dividends, asset value, free cash flow: all these yardsticks are relevant, as well as many others, but the relative weight given to each depends on the investors' judgments and is therefore subject to their bias. We may use earnings per share for purposes of illustration, but that merely begs the question. It is a question security analysts have been struggling with for a long time. We do not need to answer it here in order to develop a theory of reflexivity.

Without knowing anything about the fundamentals we can make some worthwhile generalizations. The first generalization is that stock prices must have some effect on the fundamentals (whatever they are), in order to create a boom/bust pattern. Sometimes the connection is direct, as in the examples I shall use in this chapter, but generally it is indirect. Often it makes its effect felt through a political process, such as changes in taxation, or regulation, or attitudes toward saving and investment.

It is possible to have a reflexive connection between stock prices and the prevailing bias even if the fundamentals remain unaffected, but the connection becomes interesting only if the fundamentals are also involved. Without a change in fundamentals, the prevailing bias is likely to be corrected in short order, as we can observe in the daily fluctuations of stock prices. It would be quite in order to ignore the bias as mere noise. That is what the theory of perfect competition and the fundamentalist approach to security analysis have done. By contrast, when the fundamentals are affected, the bias cannot be left out of account without serious distortion, because the bias gives rise to a self-reinforcing/self-defeating process that leaves neither stock prices, nor the fundamentals, nor the participants' views the same as they were before.

The second generalization is that there is bound to be a flaw in the participants' perception of the fundamentals. The flaw may not be apparent in the early stages but it is likely to manifest itself later on. When it does, it sets the stage for a reversal in the prevailing bias. If the

change in bias reverses the underlying trend a self-reinforcing process is set in motion in the opposite direction. What the flaw is and how and when it is likely to manifest itself are the keys to understanding boom/bust sequences.

The model I presented above is built on these two generalizations. It hardly needs emphasizing how crude the model is. Nevertheless, it is valuable in identifying the crucial features of a typical boom/bust sequence. These are the unrecognized trend; the beginning of a self-reinforcing process; the successful test; the growing conviction, resulting in a widening divergence between reality and expectations; the flaw in perceptions; the climax; a self-reinforcing process in the opposite direction. Just by identifying these features we can gain some insight into the behavior of stock prices. We cannot expect much more from our rudimentary model.

In any case, a reflexive model cannot take the place of fundamental analysis: all it can do is to provide an ingredient that is missing from it. In principle, the two approaches could be reconciled. Fundamental analysis seeks to establish how underlying values are reflected in stock prices, whereas the theory of reflexivity shows how stock prices can influence underlying values. One provides a static picture, the other a dynamic one.

A theory that offers a partial explanation of stock price movements can be very useful to the investor especially if it illuminates a relationship that other investors fail to grasp. Investors operate with limited funds and limited intelligence: they do not need to know everything. As long as they understand something better than others, they have an edge. The trouble with any kind of specialized knowledge is that one's area of expertise may not be especially interesting, but the theory of reflexivity serves to identify historically significant price movements, so it goes right to the heart of the matter.

The rudimentary model I have outlined above has proved extremely rewarding in my career as an investor. That may seem surprising because the model is so simple and it fits a well-trodden stock market pattern so well that one would expect every investor to be familiar with it. Yet, that is not the case. Why? Part of the answer must be that market participants have been misguided by a different theoretical construction, one derived from classical economics and, even more important, from the natural sciences. The ingrained attitude is that stock prices are the passive reflection of some underlying reality and

not an active ingredient in the historical process. This view is simply false. It is remarkable that the error has still not been fully recognized. Nevertheless, investors do recognize the sequence I have described and do respond to it, only they respond later than someone who is working with the appropriate model and is on the lookout for the crucial features that define the shape of the price curve. That is what has given me my edge.

The first time I used the model systematically was in the conglomerate boom of the late 1960s. It enabled me to make money both on the way up and on the way down.

The key to the conglomerate boom was a prevailing misconception among investors. Investors had come to value growth in per-share earnings and failed to discriminate about the way the earnings growth was accomplished. A few companies learned to produce earnings growth through acquisitions. Once the market started to reward them for their performance, their task became easier because they could offer their own highly priced stock in acquiring other companies.

In theory, the process works as follows. Let us assume that all of the companies involved have the same intrinsic growth in earnings but the stock of the acquiring company sells at twice the earnings multiple of the acquired ones; if the acquiring company manages to double its size, its earnings per share jump by 50%, and its growth rate increases accordingly.

In practice, the early conglomerates started out with high intrinsic growth rates that were rewarded by high multiples. Several of the pathbreakers were high-technology companies with a strong defense component whose managements recognized that their historic growth rate could not be sustained indefinitely: Textron, Teledyne, Ling-Temco-Vought (later LTV), to mention a few. They started to acquire more mundane companies, but, as their per-share earnings growth accelerated, the multiples expanded instead of contracting. Their success attracted imitators and later on even the most humdrum companies could attain a high multiple by going on an acquisition spree. For instance, the bulk of Ogden's earnings was derived from trading scrap metal; nevertheless, the stock sold at more than twenty times earnings at its peak. Eventually, a company could achieve a high multiple just by promising to put it to good use by making acquisitions.

Managements developed special accounting techniques that enhanced the impact of acquisitions. They also introduced changes in

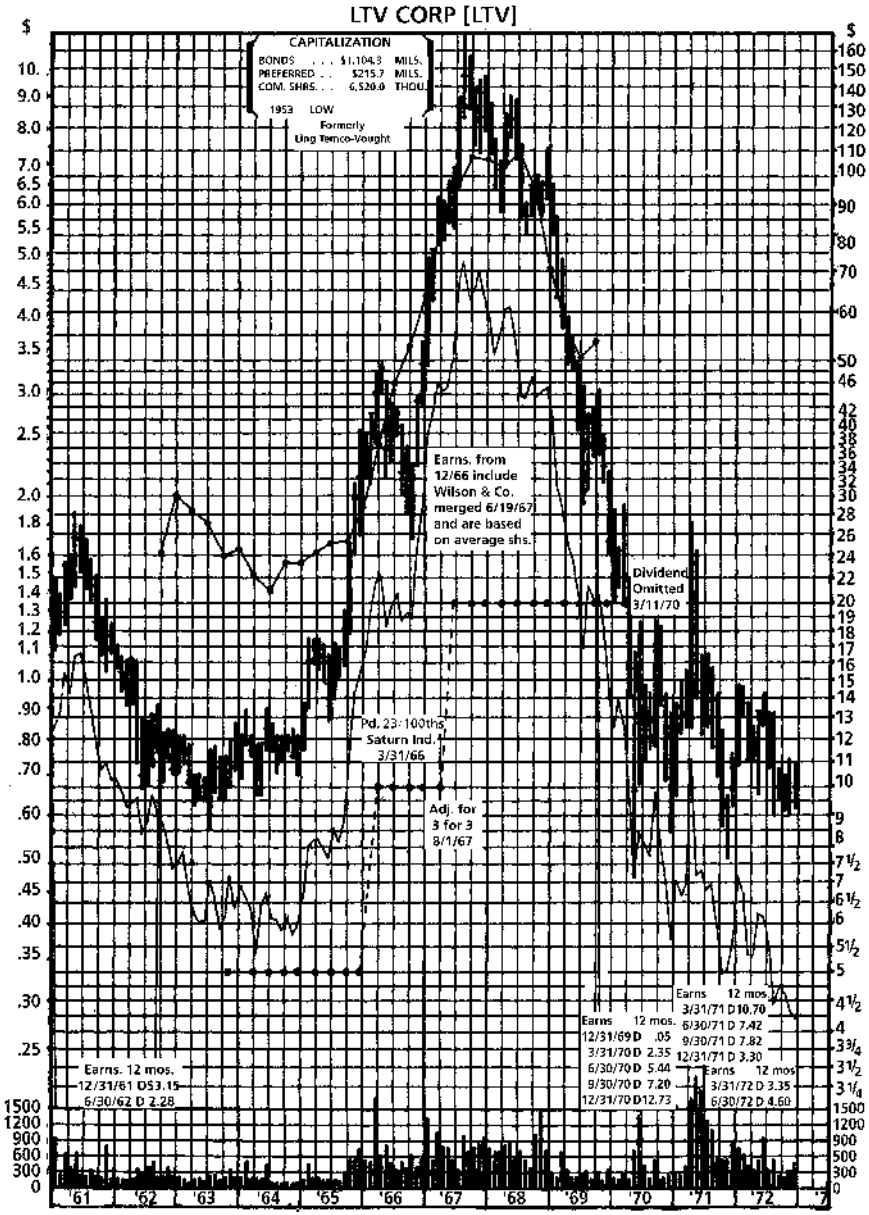
the acquired companies, streamlining operations, disposing of assets, and generally focusing on the bottom line, but these changes were less significant than the impact on per-share earnings of the acquisitions themselves.

Investors responded like Indians to firewater. At first, the record of each company was judged on its own merit, but gradually conglomerates became recognized as a group. A new breed of investors emerged, the so-called go-go fund managers, or gunslingers, who developed a special affinity with the managements of conglomerates. Direct lines of communication were opened between them and conglomerates would place so-called "letter stock" directly with investors. Eventually, conglomerates learned to manage their stock prices as well as their earnings.

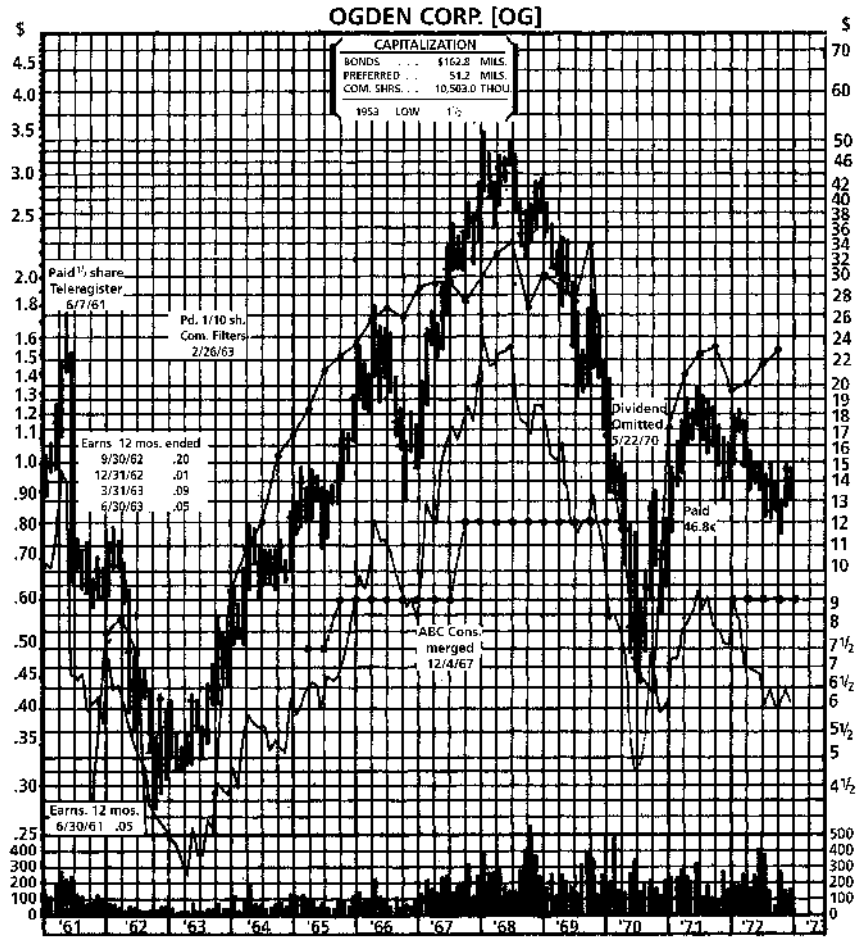
Events followed the sequence described in my model. Multiples expanded and eventually reality could not sustain expectations. More and more people realized the misconception on which the boom rested even as they continued to play the game. Acquisitions had to get larger and larger in order to maintain the momentum, and in the end they ran into the limits of size. The climactic event was the attempt by Saul Steinberg to acquire Chemical Bank: it was fought and defeated by the establishment.

When stock prices started to fall, the decline fed on itself. The favorable impact of acquisitions on per-share earnings diminished and eventually it became impractical to make new acquisitions. The internal problems that had been swept under the carpet during the period of rapid external growth began to surface. Earnings reports revealed unpleasant surprises. Investors became disillusioned and managements went through their own crises: after the heady days of success, few were willing to buckle down to the burdens of day-to-day management. The situation was aggravated by recession, and many of the high-flying conglomerates literally disintegrated. Investors were prepared to believe the worst and in some cases the worst actually occurred. In others, reality turned out to be better than expectations and eventually the situation stabilized with the surviving companies, often under new management, slowly working themselves out from under the debris.

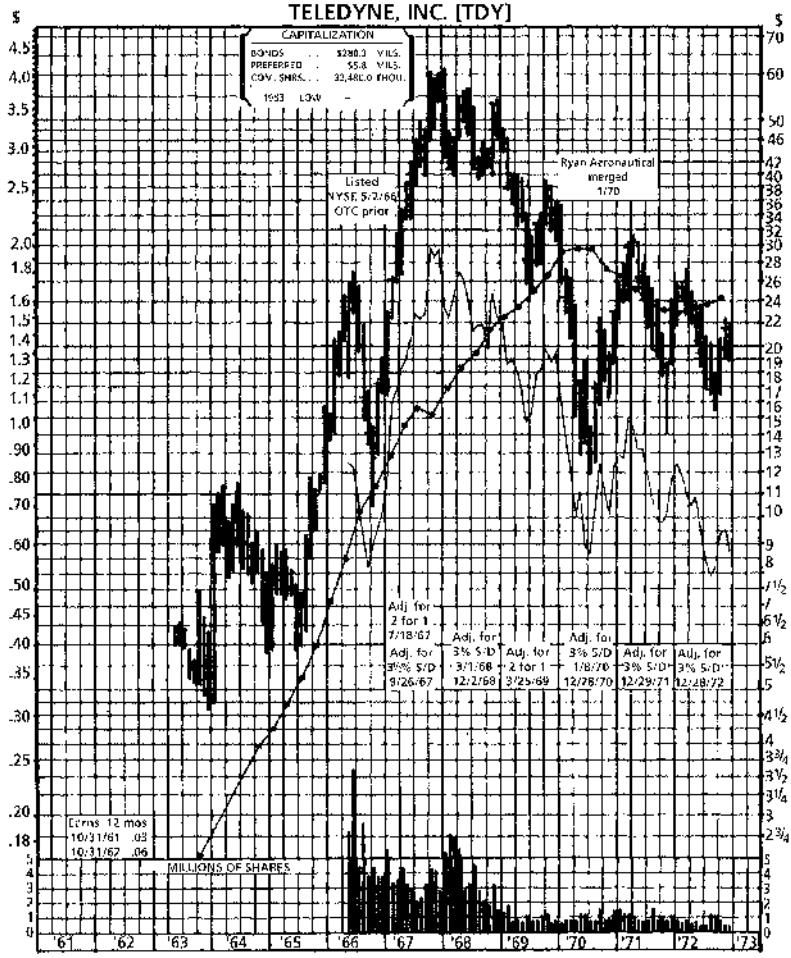
The conglomerate boom is particularly well suited to serve as an illustration of my rudimentary model because the "fundamentals" are readily quantified. Investors based their valuations on reported per-share earnings. However meaningless the figures, they provide charts that closely conform to my theoretical prototype. Here they are:



(Courtesy of Securities Research Company, a Division of Babson-United Investment Advisors, Inc., 208 Newbury St., Boston, MA 02116.)



(Courtesy of Securities Research Company, a Division of Babson-United Investment Advisors, Inc., 208 Newbury St., Boston, MA 02116.)



(Courtesy of Securities Research Company, a Division of Babson-United Investment Advisors, Inc., 208 Newbury St., Boston, MA 02116.)

My best documented encounter with a boom/bust sequence is that of Real Estate Investment Trusts. REITs, as they are called, are a special corporate form brought into existence by legislation. Their key feature is that they can distribute their income free of corporate taxation, provided they distribute all the income they receive. The opportunity created by this legislation remained largely unexploited until 1969 when a large number of REITs were founded. I was present at the creation and, fresh from my experience with conglomerates, recognized their boom/bust potential. I published a research report whose key part reads as follows:

THE CASE FOR MORTGAGE TRUSTS
(February 1970)

THE CONCEPT

Superficially, mortgage trusts seem to resemble mutual funds designed to provide high current yields. But the analogy is misleading. The true attraction of mortgage trusts lies in their ability to generate capital gains for their shareholders by selling additional shares at a premium over book value. If a trust with a book value of $10 and a 12% return on equity doubles its equity by selling additional shares at $20, the book value jumps to $13.33 and per-share earnings go from $1.20 to $1.60.

Investors are willing to pay a premium because of the high yield and the expectation of per-share earnings growth. The higher the premium, the easier it is for the trust to fulfill this expectation. The process is a self-reinforcing one. Once it gets under way, the trust can show a steady growth in per-share earnings despite the fact that it distributes practically all its earnings as dividends. Investors who participate in the process early enough can enjoy the compound benefits of a high return on equity, a rising book value, and a rising premium over book value.

ANALYTICAL APPROACH

The conventional method of security analysis is to try and predict the future course of earnings and then to estimate the price that investors may be willing to pay for those earnings. This method is inappropriate to the analysis of mortgage trusts because the price that investors are willing to pay for the shares is an important factor in determining the future course of earnings.

Instead of predicting future earnings and valuations separately, we shall try to predict the future course of the entire self-reinforcing process. We shall identify three major factors which reinforce each other and we shall sketch out a scenario of the probable course of development. The three factors are:

1. The effective rate of return on the mortgage trust's capital
2. The rate of growth of the mortgage trust's size

3. Investor recognition, i.e., the multiple investors are willing to pay for a given rate of growth in per-share earnings

THE SCENARIO

Act One: At present, the effective yield on construction loans is at an optimum. Not only are interest rates high but losses are at a relatively low level. There is a pent-up demand for housing and new houses readily find buyers. There is a shortage of funds so that the projects which do get off the ground are economically well justified. Builders who are still in business are more substantial and more reliable than at the tail end of a boom. Moreover, they do their utmost to complete the construction phase as fast as possible because money is so expensive. Shortages of labor and material do cause defaults and delays but rising costs permit mortgage trusts to liquidate their commitments without loss.

Money is tight and alternative sources of interim financing are in short supply. Investor recognition of the mortgage trust concept has progressed far enough to permit the formation of new trusts and the rapid expansion of existing ones. The self-reinforcing process gets under way.

Act Two: If and when inflation abates, the effective yield on construction loans will decline. On the other hand, there will be a housing boom and bank credit will be available at advantageous rates. With higher leverage, the rate of return on equity can be maintained despite a lower effective yield. With a growing market and growing investor recognition, the premium over book value may continue to increase. Mortgage trusts are likely to take full advantage of the premium and show a rapid rise in both size and per-share earnings. Since entry into the field is unrestricted, the number of mortgage trusts will also increase.

Act Three: The self-reinforcing process will continue until mortgage trusts have captured a significant part of the construction loan market. Increasing competition will then force them to take greater risks. Construction activity itself will have become more

(Continued)

speculative and bad loans will increase. Eventually, the housing boom will slacken off and housing surpluses will appear in various parts of the country, accompanied by a slack real estate market and temporary declines in real estate prices. At this point, some of the mortgage trusts will be bound to have a large number of delinquent loans in their portfolios and the banks will panic and demand that their lines of credit be paid off.

Act Four: Investor disappointment will affect the valuation of the group, and a lower premium coupled with slower growth will in turn reduce the per-share earnings progression. The multiple will decline and the group will go through a shakeout period. After the shakeout, the industry will have attained maturity: there will be few new entries, regulations may be introduced, and existing trusts will settle down to a more moderate growth.

EVALUATION

The shakeout is a long time away. Before it occurs, mortgage trusts will have grown manifold in size and mortgage trust shares will have shown tremendous gains. It is not a danger that should deter investors at the present time.

The only real danger at present is that the self-reinforcing process may not get under way at all. In a really serious stock market decline investors may be unwilling to pay any premium even for a 12% return on equity. We doubt that such conditions would arise; we are more inclined to expect an environment in which a 12% return is more exceptional than it has been recently and in which the self-reinforcing processes of the last few years, notably conglomerates and computer leasing companies, are going through their shakeout period. In such an environment there should be enough money available for a self-reinforcing process which is just starting, especially if it is the only game in town.

If the process fails to get under way, investors would find downside protection in the book value. The new trusts are coming to the market at book value plus underwriting commission (usually 10%). Most recently formed trusts are selling at a premium which is still modest. It will be recalled that when their assets are

fully employed in interim loans, mortgage trusts can earn 11% on their book without leverage and 12% with a 1:1 leverage. A modest premium over book value would seem justified even in the absence of growth.

If the self-reinforcing process does get under way, shareholders in well-managed mortgage trusts should enjoy the compound benefits of a high return on equity, a rising book value, and a rising premium over book value for the next few years. The capital gains potential is of the same order of magnitude as at the beginning of other self-reinforcing processes in recent stock market history.

My report had an interesting history. It came at a time when go-go fund managers had suffered severe losses in the collapse of the conglomerates. Since they were entitled to share in the profits but did not have to share in the losses of the funds they managed, they were inclined to grasp at anything that held out the prospect of a quick profit. They instinctively understood how a self-reinforcing process works since they had just participated in one and they were anxious to play. The report found a tremendous response whose extent I realized only when I received a telephone call from a bank in Cleveland asking for a new copy because theirs had gone through so many Xerox incarnations that it was no longer legible. There were only a few mortgage trusts in existence at the time but the shares were so eagerly sought after that they nearly doubled in price in the space of a month or so. Demand generated supply and there was a flood of new issues coming to market. When it became clear that the stream of new mortgage trusts was inexhaustible, prices fell almost as rapidly as they had gone up. Obviously the readers of the report failed to take into account the ease of entry and their mistake was corrected in short order. Nevertheless their enthusiastic reception helped to get the self-reinforcing process described in the report under way. Subsequent events took the course outlined in the report. Mortgage trust shares enjoyed a boom that was not as violent as the one that followed the publication of the report but turned out to be more enduring.

I had invested heavily in mortgage trusts and took some profits when the reception of my study exceeded my expectations. But I was

sufficiently carried away by my own success to be caught in the downdraft with a significant inventory. I hung on and even increased my positions. I followed the industry closely for a year or so and sold my holdings with good profits. Then I lost touch with the group until a few years later when problems began to surface. I was tempted to establish a short position but was handicapped in that I was no longer familiar with the terrain. Nevertheless, when I reread the report I had written several years earlier, I was persuaded by my own prediction. I decided to sell the group short more or less indiscriminately. Moreover, as the shares fell I maintained the same level of exposure by selling additional shares short. My original prediction was fulfilled and most REITs went broke. The result was that I reaped more than 100% profit on my short positions—a seeming impossibility since the maximum profit on a short position is 100%. (The explanation is that I kept on selling additional shares.)

Self-reinforcing/self-defeating cycles like the conglomerate boom and the REITs do not occur every day. There are long fallow periods when the specialist in such cycles remains unemployed. He need not starve, however. The divergence between underlying trends and investor recognition persists at all times and the astute investor can take advantage of it. New industries arise, or old ones come back into favor. Typically, they are inadequately followed at first. For instance, when defense spending started to rise in the early 1970s after a long decline, there were only two or three analysts left who followed the industry, although it still represented a substantial portion of the economy. Those who were left were too demoralized to recognize the beginning of a major new trend. That was a wonderful time to invest in defense stocks. There were high-tech defense stocks that had never been visited by an analyst, like E-Systems, Inc., and well-established companies that had fallen on evil days trying to diversify out of defense, like Sanders Associates, or getting caught up in scandals trying to sell airplanes through bribery, like Northrop and Lockheed.

In the case of defense stocks, there was no self-reinforcing process involved but investor recognition certainly helped the price of the stocks. Actually, it is a rare case where the investors' bias leaves the fundamentals totally unaffected. Even with defense stocks the prevailing bias played a role, but it was a negative one. Lockheed had to be bailed out by the government and companies like Sanders Associates had to restructure their debt by offering convertible bonds at prices that

turned out to be very low in retrospect. Only when the negative bias was corrected was there very little further feedback: companies had little need for additional capital, and managements, having been burned once before, were leery of diversifying out of defense. There were exceptions, like United Aircraft, but investors' bias never turned positive enough to allow a self-reinforcing process to get under way: many of United Aircraft's acquisitions were for cash and those that involved stock did not enhance earnings significantly. The result was a larger, diversified company, but no boom and bust in the stock.

Perhaps the most interesting case of negative bias occurred in technology stocks. After the stock market debacle of 1974, investors were leery of any company that needed to raise equity capital from outside sources. Distributed data processing was in the early stages of its development. New companies like Datapoint and Four-Phase were in the vanguard with IBM lagging badly. The market was practically exploding but these little companies were hamstrung by their inability to raise capital. The stocks were selling at very low multiples of anticipated earnings and the main argument against them was that they would not be able to grow fast enough to meet the demand and eventually IBM would move into the market. The argument turned out to be valid, but not before these companies became large and prosperous and investors became eager to throw money at them at high multiples. Those who had been willing to fight the negative bias were amply rewarded.

As the various niches occupied by these small companies converged to form a large market, most of them were absorbed by larger companies and those that stayed independent fell on evil days. Datapoint is currently looking for a home at a much reduced multiple. Four-Phase was recently acquired by Motorola, which proceeded to lose its shirt on it. If the initial market reaction to distributed data-processing companies had been more positive, it is possible that some of the early starters might have grown fast enough to survive, just as the earlier wave of microcomputer manufacturers did spawn a few enduring companies like Digital Equipment and Data General.

The negative bias of the 1975–1976 period gave way to the opposite extreme. It found expression in a venture capital boom that culminated in the second quarter of 1983. The sequence of events is not as clear cut as in the case of REITs, but that is only because high technology is not as homogeneous an industry. The same reflexive interaction between stock prices, prevailing bias, and fundamentals can be

observed but much more specific knowledge is required to trace the course of events.

The availability of venture capital on attractive terms led to a proliferation of new ventures. Every new company needed equipment, as well as inventory, so that electronic equipment manufacturers enjoyed a boom, and so did the manufacturers of products and components. The electronics industry is a large customer of its own products so that the boom was self-reinforcing. But the proliferation of companies intensified competition. Industry leaders lost their market position as a new generation of products was introduced because the individuals who were responsible for developing them left their companies and set up new ones. Instead of companies growing in step with their industry, the industry grew by the multiplication of companies. Investors failed to recognize this trend; as a result, technology stocks in general and new issues in particular became substantially overvalued.

The new issue boom culminated in the second quarter of 1983. When prices started to decline, fewer issues could be sold and eventually venture capitalists became less venturesome. As fewer companies were formed and the existing ones depleted their cash, the market for technology products softened. Competition intensified and profit margins deteriorated. The process started to feed on itself and the low point has probably still not been reached.*

The venture capital boom was not the only cause of the subsequent shakeout—the strong dollar and the rise of Japanese competition were at least as important—but it is clear that stock prices had an impact on the "fundamentals" in both directions.

What distinguishes the conglomerate and REIT sequences from the venture capital boom is that in the first two cases the underlying trend itself was based on the exploitation of the investors' bias while in the third it was not. In the case of conglomerates the idea was to acquire other companies with inflated paper; in the case of REITs the idea was equity leveraging. The idea behind the latest generation of technology products had nothing to do with the stock market.

To understand the ups and downs of technology stocks we must know something about the underlying trends in technology; in the case

*P.S., February 1987: No longer true after the current explosive rally.

of conglomerates and REITs we need to know little else than the theory of reflexivity.

It is important to realize, however, that knowing everything about underlying trends in technology is not sufficient to explain the ups and downs of technology stocks: the reflexive interaction between underlying trends, prevailing biases, and stock prices also needs to be understood. Combining the two kinds of understanding is extremely difficult. Those who want to be familiar with technology must follow the industry closely and continuously; those who want to exploit the divergence between perception and reality must move from group to group. Most technology experts are ignorant of reflexivity and tend to remain fully invested at all times. Their popularity and influence wax and wane in a reflexive fashion. After the recent decline in technology stocks, a new breed of analysts seems to be emerging who are overly sensitive to the importance of investors' perceptions. After a decent interval it may be once again profitable to go against the prevailing bias and invest in technology stocks on the basis of fundamental trends.

I have always had a lot of difficulty investing in technology stocks because of the specialized knowledge required. Finally, I managed to gain a good insight into the computer industry during the 1975–1976 period and profited from the prevailing negative bias. I held on to my positions for a few years but then I sold them and lost my grip on the industry. In 1981 I made the mistake of not participating in a venture capital fund operated by one of the most successful venture capitalists of the period in the belief that the boom could not last long enough to allow investors to exit in time. In this, I was undoubtedly influenced by misgivings about the larger picture. In any event, his investors realized a good profit in 1983. By that time I was totally out of touch with technology stocks and the boom passed me by.

Even the conglomerate and REIT sequences were not totally self-contained. Extraneous developments, such as the level of economic activity, regulation, or specific events (e.g., the attempted takeover of Chemical Bank), played a crucial role in the conglomerate boom. In less "pure" sequences the importance of outside influences is even greater.

We are currently in the midst of another self-reinforcing/self-defeating cycle that will go down in history as the mergermania of the 1980s. Instead of inflated paper, it is cash that serves as the currency. The

scale of transactions already dwarfs the conglomerate boom. Mergermania is but an element in a much larger ongoing historical drama whose ramifications reach far beyond the stock market and involve politics, exchange rates, monetary and fiscal policies, quirks of taxation, international capital movements, and many other developments.

I shall make an attempt at unraveling the ongoing historical drama, but that is not as simple as analyzing a more or less self-contained boom/bust sequence. The larger picture is full of reflexive interactions as well as nonreflexive fundamental trends. We need a more complex model that allows for the transition from one boom/bust sequence to another and for the coexistence of several reflexive processes at the same time.

Before I embark on such an ambitious project, I want to examine another market that is characterized by vicious and benign circles: the currency market.