

# 2

## Anatomy of a Typical Crisis

### History vs economics

For historians each event is unique. In contrast economists maintain that there are patterns in the data and particular events are likely to induce similar responses. History is particular; economics is general. The business cycle is a standard feature of market economies; increases in investment in plant and equipment lead to increases in household income and the rate of growth of national income. Macroeconomics focuses on the explanations for the cyclical variations in the rate of growth of national income relative to its long-run trend rate of growth.

An economic model of a general financial crisis is presented in this chapter, while the various phases of the speculative manias that lead to crises are illustrated in the following chapters. This model of general financial crises covers the boom and the subsequent bust and centers on the episodic nature of the manias and the subsequent crises. This model differs from those that focus on the variations and the periodicity of economic expansions and contractions, including the Kitchin inventory cycle of thirty-nine months, the Juglar cycle of investment in plant and equipment that has a periodicity of seven or eight years and the Kuznets cycle of twenty years that highlights the rise and fall in housing construction.<sup>1</sup> In the first two-thirds of the nineteenth century, crises occurred regularly at ten-year intervals (1816, 1826, 1837, 1847, 1857, 1866), thereafter crises occurred less regularly (1873, 1907, 1921, 1929).

### The model

A model developed by Hyman Minsky is used to interpret the financial crises in the United States, Great Britain and other market economies. Minsky highlighted the pro-cyclical changes in the supply of credit, which increased when the economy was booming and decreased during economic slowdowns. During the expansion phase investors became more optimistic about the future and

they revised upward their estimates of the profitability of a wide range of investments and so they became more eager to borrow. At the same time, both the lenders' assessments of the risk of individual investments and their risk averseness declined and so they became more willing to make loans, including some for investments that previously had seemed too risky.

When the economic conditions slowed, the investors became less optimistic and more cautious. At the same time, the loan losses of the lenders increased and they became much more cautious.

Minsky believed that the pro-cyclical increases in the supply of credit in good times and the decline in the supply of credit in less buoyant economic times led to fragility in financial arrangements and increased the likelihood of financial crisis.

This model is in the tradition of the classical economists, including John Stuart Mill, Alfred Marshall, Knut Wicksell and Irving Fisher, who also focused on the instability in the supply of credit. Minsky followed Fisher and attached great importance to the behavior of heavily indebted borrowers, particularly those that increased their indebtedness in the expansion to finance the purchase of real estate or stocks or commodities for short-term capital gains. The motive for these transactions was that the anticipated rates of increase in the prices of these assets would exceed the interest rates on the funds borrowed to finance their purchases. When the economy slowed some of these borrowers might be disappointed because the rates of increase in the prices of the assets proved smaller than the interest rates on the borrowed money and so many would become distress sellers.

Minsky argued that the events that lead to a crisis start with a 'displacement', some exogenous, outside shock to the macroeconomic system.<sup>2</sup> If the shock was sufficiently large and pervasive, the economic outlook and the anticipated profit opportunities would improve in at least one important sector of the economy. Business firms and individuals would borrow to take advantage of the increase in the anticipated profits associated with a wide range of investments. The rate of economic growth would accelerate and in turn there might be a feedback to even greater optimism. It's 'Japan as Number One' or the 'East Asian Miracle' or 'The New American Economy' – a new sense of more profound optimism about the economic environment. The words differ across the countries but the tune is the same.

The nature of the shock varies from one speculative boom to another. The shock in the United States in the 1920s was the rapid expansion of automobile production and associated development of highways together with the electrification of much of the country and the rapid expansion of the number of households with telephones. The shocks in Japan in the 1980s were financial liberalization and the surge in the foreign exchange value of the yen. The shock in the Nordic countries in the 1980s was financial liberalization.

The shock in the Asian countries in the 1990s was the implosion of the asset price bubble in Japan and the appreciation of the yen which led to increases in the inflows of money from Tokyo together with financial liberalization at home. The shock in the United States in the 1990s was the revolution in information technology and new and lower-cost forms of communication and control that involved the computer, wireless communication and e-mail. At times the shock has been outbreak of war or the end of a war, a bumper harvest or crop failure, the widespread adoption of an invention with pervasive effects – canals, railroads. An unanticipated change of monetary policy has been a major shock.

If the shock is sufficiently large and pervasive, the anticipated profit opportunities improve in at least one important sector of the economy: the profit share of GDP increases. In the early 1980s, US corporate profits were 3 percent of GDP; toward the end of the 1990s this ratio had increased to 10 percent. That corporate profits were increasing one-third more rapidly than US GDP in turn contributed to the significant increase in stock prices.

The boom in the Minsky model is fueled by an expansion of credit. In the pre-banking seventeenth and eighteenth centuries personal credit or vendor financing fueled the speculative boom. Once banks had been developed they expanded the supply of credit and their liabilities; in the first several decades of the nineteenth century they increased the supplies of bank notes and subsequently they added to the deposit balances of individual borrowers. In addition to the expansion of credit by the established banks, new banks may be formed; the efforts of these new banks to increase market share can lead to rapid growth of credit and money because the established banks have often been reluctant to accept a decline in market share that they would otherwise incur. In the 1970s the European banks were beginning to poach on the turf of the US banks in making loans to the governments in Latin America.

Minsky argued that the growth of bank credit has been very unstable; at times the banks as lenders have become more euphoric and have lent freely and then at other times they have become extremely cautious and let the borrowers 'swing in the wind'.

One central policy issue centers on the control of credit from banks and from other suppliers of credit. Often the authorities in a country have applied strict controls to the ability of banks to make certain types of loans. The banks then set up wholly-owned subsidiaries that can make the loans the banks themselves are prohibited from making. Or the loans are made by the bank holding companies. Even if the instability of credits from the financial institutions were controlled, increases in the supply of personal credit could finance the boom.

Assume an increase in the effective demand for goods and services. After a time, the increase in demand presses against the capacity to produce goods. Market prices increase, and the more rapid increase in profits attracts both more investment and more firms. Positive feedback develops as the increase in

investment leads to increases in the rate of growth of national income that in turn induce additional investment so the rate of growth of national income accelerates.

Minsky noted that 'euphoria' might develop at this stage. Investors buy goods and securities to profit from the capital gains associated with the anticipated increases in the prices of these goods and securities. The authorities recognize that something exceptional is happening in the economy and while they are mindful of earlier manias, 'this time it's different', and they have extensive explanations for the difference. Chairman Greenspan discovered a surge in US productivity about a year after he first became concerned about the high level of US stock prices in 1996; the increase in productivity meant that profits would increase at a more rapid rate, and so the higher level of stock prices relative to corporate earnings did not seem unreasonable.

### **Minsky's three-part taxonomy**

Minsky distinguished between three types of finance – hedge finance, speculative finance, and Ponzi finance – on the basis of the relation between the operating income and the debt service payments of individual borrowers. A firm is in the hedge finance group if its anticipated operating income is more than sufficient to pay both the interest and scheduled reduction in its indebtedness. A firm is in the speculative finance group if its anticipated operating income is sufficient so it can pay the interest on its indebtedness; however the firm must use cash from new loans to repay part or all of the amounts due on maturing loans. A firm is in the Ponzi group if its anticipated operating income is not likely to be sufficiently large to pay all of the interest on its indebtedness on the scheduled due dates; to get the cash the firm must either increase its indebtedness or sell some assets.

Minsky's hypothesis is that when the economy slows, some of the firms that had been involved in hedge finance are shunted to the group involved in speculative finance and that some of the firms that had been involved in the speculative finance group now find they are in the Ponzi finance group.

The term 'Ponzi finance' memorializes Carlos Ponzi, who operated a small loans company in one of the Boston suburbs in the early 1920s. Ponzi promised his depositors that he would pay interest at the rate of 30 percent a month and his financial transactions went smoothly for three months. In the fourth month however the inflow of cash from new depositors was smaller than the interest payments promised to the older borrowers and eventually Ponzi went to prison.

The term Ponzi finance is now a generic term for a non-sustainable pattern of finance. The borrowers can only meet their commitments to pay the high interest rates on their outstanding loans or deposits if they obtain the cash from new loans or deposits. Since in many arrangements the interest rates are very high, often 30 to 40 percent a year, the continuation of the arrangement requires that there be a continuous injection of new money and often at an accelerating rate. Initially many of the existing depositors are so pleased with their high returns that they allow their interest income to compound; the cliché is that they are 'earning interest on the interest'.

As a result the inflow of new money can be below the promised interest rate for a few months. But to the extent that some depositors take some of their interest returns in cash, the arrangement can operate only as long as these withdrawals are smaller than the inflow of new money.

The result of the continuation of the process is what Adam Smith and his contemporaries called 'overtrading'. This term is less than precise and includes speculation about increases in the prices of assets or commodities, an overestimate of prospective returns, or 'excessive leverage'.<sup>3</sup> Speculation involves buying commodities for the capital gain from anticipated increases in their prices rather than for their use. Similarly speculation involves buying securities for resale rather than for investment income attached to these commodities. The euphoria leads to an increase in the optimism about the rate of economic growth and about the rate of increase in corporate profits and affects firms engaged in production and distribution. In the late 1990s Wall Street security analysts projected that US corporate profits would increase at the rate of 15 percent a year for five years. (If their forecasts had been correct, then at the end of the fifth year the share of US corporate profits in US GDP would have been 40 percent higher than ever before.) Loan losses incurred by the lenders decline and they respond and become more optimistic and reduce the minimum down payments and the minimum margin requirements. Even though bank loans are increasing, the leverage – the ratio of debt to capital or to equity – of many of their borrowers may decline because the increase in the prices of the real estate or securities means that the net worth of the borrowers may be increasing at a rapid rate.

A follow-the-leader process develops as firms and households see that others are profiting from speculative purchases. 'There is nothing as disturbing to one's well-being and judgment as to see a friend get rich.'<sup>4</sup> Unless it is to see a non-friend get rich. Similarly banks may increase their loans to various groups of borrowers because they are reluctant to lose market share to other lenders which are increasing their loans at a more rapid rate. More and more firms and households that previously had been aloof from these speculative ventures begin to participate in the scramble for high rates of return. Making money never seemed easier. Speculation for capital gains leads away from normal, rational behavior to what has been described as a 'mania' or a 'bubble'.

The word 'mania' emphasizes irrationality; 'bubble' foreshadows that some values will eventually burst. Economists use the term bubble to mean any deviation in the price of an asset or a security or a commodity that cannot be explained in terms of the 'fundamentals'. Small price variations based on fundamentals are called 'noise'. In this book, a bubble is an upward price movement over an extended period of fifteen to forty months that then implodes.

Someone with 'perfect foresight' should have foreseen that the process was not sustainable and that an implosion was inevitable.

In the twentieth century most of the manias and bubbles have centered on real estate and stocks. There was a mania in land in Southeast Florida in the mid-1920s and an unprecedented bubble in US stocks in the second half of the 1920s. In Japan in the 1980s the speculative purchases of real estate induced a boom in the stock market. Similarly the bubble in the Asian countries in the 1990s involved both real estate and stocks, and generally increases in real estate prices pulled up stock prices. The US bubble in the late 1990s primarily involved stocks, although the increases in household wealth in Silicon Valley and several regions led to surges in real estate prices. The oil price shocks of the 1970s led to surges in real estate activity in Texas, Oklahoma and Louisiana. Similarly the sharp increases in the prices of cereals in the inflationary 1970s led to surges in land prices in Iowa, Nebraska and Kansas and other Midwest farm states.

### **International propagation**

Minsky focused on the instability in the supply of credit in a single country. Historically euphoria has often spread from one country to others through one of several different channels. The bubble in Japan in the 1980s had significant impacts on South Korea, Taiwan and the State of Hawaii. South Korea and Taiwan were parts of the Japanese supply chain; if Japan is doing well economically, its former colonies will do well. Hawaii is to Tokyo as Miami is to New York; Japanese travel to Hawaii for rest and recreation in the sun. Hawaii experienced a real estate boom in the 1980s as the Japanese bought second homes and golf courses and hotels.

One conduit from a shock in one country to its impacts in other countries is arbitrage which ensures that the changes in the price of a commodity in one national market will lead to comparable changes in the prices of the more or less identical commodity in other national markets. Thus changes in the price of gold in Zurich, Beirut and Hong Kong are closely tied to changes in the price of gold in London. Similarly changes in the prices of securities in one national market will lead to nearly identical changes in the prices of the same securities in other national markets.

In addition increases in national income in one country induce increases in its demand for imports and hence increases in counterpart exports in other countries and in the national incomes in these countries. Capital flows constitute a third link; the increase in the exports of securities from one country will lead to increases in both the price of these securities and the value of its currency in the foreign exchange market.

Moreover there are psychological connections, as when investor euphoria or pessimism in one country affects investors in others. The declines in stock prices on 19 October 1987 were practically instantaneous in all national financial

centers (except Tokyo), far faster than can be accounted for by arbitrage, income changes, capital flows or money movements.

In the ideal textbook world an increase in the gold coins in circulation in one country because of the flow of gold to that country would be matched by a corresponding decline in the gold supplies in other countries, and the increase in the money supply and the credit expansion in the first country would be offset by the contraction of credit and the money supply in the second. In the real world, however, the increase in the credit expansion in the first country may not be followed by a contraction of credit in the second country, because investors in the second country may respond to rising prices and profits abroad by demanding more credit so they can buy the assets and securities whose prices they anticipate will increase. The potential contraction from the shrinkage in the monetary base in the second country may be overwhelmed by the increase in speculative interest and the increase in the demand for credit.

As the speculative boom continues, interest rates, the speed of payments and the commodity price level increase. The purchases of securities or real estate by 'outsiders' means that the insiders – those who owned or purchased these assets earlier – sell the same securities and real estate and take some profits. A few insiders take their profits and sell; indeed if newcomers to the market are buyers, then the insiders must be sellers. At every moment the purchases of real estate or stocks by the new investors or outsiders are necessarily balanced by sales by the insiders. In 1928 the market value of the stocks traded on the New York Stock Exchange increased at an annual rate of 36 percent, and in the first eight months of 1929 the market value increased at an annual rate of 53 percent. Similarly in 1998 the market value of the stocks traded on the NASDAQ increased at an annual rate of 41 percent; in the subsequent fifteen months they increased at the annual rate of 101 percent. Investors rush to get on the train before it leaves the station and accelerates. If the eagerness of the outsiders to buy is stronger than the eagerness of the insiders to sell, the prices of the assets or securities continue to increase. In contrast if the sellers become more eager than the buyers, then the prices will decline.

As the buyers become less eager and the sellers become more eager an uneasy period of 'financial distress' follows; the term is from corporate finance and reflects that a firm is unable to adhere to its debt servicing commitments. For the economy as a whole, the equivalent is the awareness on the part of a considerable segment of both firms and individual investors that it is time to become more liquid – to reduce holdings of real estate and stocks and to increase holdings of money. The prices of goods and securities may fall sharply. Some highly leveraged investors may go bankrupt because the decline in asset prices is so sharp that the value of their assets declines below the amounts borrowed to buy the same assets. Some investors continue to hold the assets despite the decline in price because they believe that the decline in prices is temporary, a hiccup.

The prices of the securities may begin to increase again; in Tokyo in the 1990s there were six 'bear market rallies' that involved stock price increases of more than 20 percent even though the trend was that stock prices had been declining. But some investors believed that stock prices had declined too far, and so they wanted to be among the first to buy the stocks while they were still cheap.

As the decline in prices continues, more and more investors realize that prices are unlikely to increase and that they should sell before prices decline further; in some cases this realization occurs gradually and in others suddenly. The race out of real or long-term financial securities and into money may turn into a stampede.

The specific signal that precipitates the crisis may be the failure of a bank or of a firm, the revelation of a swindle or defalcation by an investor who sought to escape distress by dishonest means, or a sharp fall in the price of a security or a commodity. The rush is on – prices decline and bankruptcies increase. Liquidation sometimes is orderly but may degenerate into panic as the realization spreads that only a relatively few investors can sell while prices remain not far below their peak values. In the nineteenth century the word 'revulsion' was used to describe this behavior. The banks become much more cautious in their lending on the collateral of commodities and securities. In the early nineteenth century this condition was known as 'discredit'.

'Overtrading', 'revulsion', 'discredit' have a musty, old-fashioned flavor; they convey a graphic picture of the decline in investor optimism.

Revulsion and discredit may lead to panic (or as the Germans put it, *Torschlusspanik*, 'door-shut-panic') as investors crowd to get through the door before it slams shut. The panic feeds on itself until prices have declined so far and have become so low that investors are tempted to buy the less liquid assets, or until trade in the assets is stopped by setting limits on price declines, shutting down exchanges or otherwise closing trading, or a lender of last resort succeeds in convincing investors that money will be made available in the amounts needed to meet the demand for cash and that hence security prices will no longer decline because of a shortage of liquidity. Confidence may be restored even without a large increase in the volume of money because the confidence that one can get money may be sufficient to reduce the demand for liquidity.

Whether a lender of last resort should provide liquidity to forestall a panic and the decline in prices of real estate and stocks has been debated extensively. Those who oppose the provision of liquidity from a lender of last resort argue that the knowledge that such credits will be available encourages speculation. Those who want a lender of last resort worry more about coping with the current crisis and reducing the likelihood that a liquidity crisis will cascade into a solvency crisis than they do about forestalling a future crisis. In domestic crises, government or the central bank has responsibility to act as a lender of last resort. At the international level, there is neither a world government nor



any world bank adequately equipped to serve as a lender of last resort. The International Monetary Fund has not met the expectations of its founders as a lender of last resort.

## **The validity of the model**

Three types of criticism have been directed at the Minsky model. One criticism is that each crisis is unique so that a general model is not relevant. A second is that this type of model is no longer relevant because of changes in business and economic environments. A third is that asset price bubbles are highly improbable because 'all the information is in the price' – the mantra of the efficient market view of finance.

Each criticism merits its own response.

The first criticism is that each crisis is unique, a product of a unique set of circumstances, or that there are such wide differences among economic crises as a class that they should be broken down into various species, each with its own particular features. Financial crises were frequent in the first two-thirds of the nineteenth century and in the last third of the twentieth century. In this view, each unique crisis is a product of a specific series of historical accidents – which was said about 1848 and about 1929,<sup>5</sup> and may be inferred from the historical accounts of separate crises referred to throughout this book. Each crisis also has its unique individual features – the nature of the shock, the object of speculation, the form of credit expansion, the ingenuity of the swindlers and the nature of the incident that touches off revulsion. But if one may borrow a French phrase, the more something changes, the more it remains the same. Details proliferate; structure abides.

More compelling is the suggestion that the genus 'crises' should be divided into commercial, industrial, monetary, banking, fiscal and financial (in the sense of financial markets) species or into local, regional, national and international groups. Taxonomies along such lines abound. This view is not accepted because the primary concern is with international financial crises that involve a number of critical elements – speculation, monetary expansion, an increase in the prices of securities or real estate or commodities followed by a sharp fall and a rush into money. The test is whether use of the Minsky model provides insights about the broad features of the crises.

The second criticism is that the Minsky model of the instability of the supply of credit is no longer relevant because of structural changes in the institutional underpinnings of the economy, including the rise of the corporation, the emergence of big labor unions and big government, modern banking and speedier communications. The financial debacles in Mexico, Brazil, Argentina and more than ten other developing countries in the early 1980s are consistent with the Minsky model; the increases in the external indebtedness of these countries

were much higher than the interest rates on their loans so the borrowers were obtaining all of the cash to pay the scheduled interest from the lenders. The bubble in real estate prices and stock prices in Japan in the second half of the 1980s and the subsequent implosion of asset prices is consistent with the Minsky model since the annual increases in the prices of stocks and real estate was three or four times higher than the interest rates on the funds borrowed to finance the purchases of these assets. The booms and the subsequent busts in Thailand and Hong Kong and Indonesia and then in Russia feature the same pattern of cash flows.

The third criticism is that there can be no bubbles because market prices always reflect the economic fundamentals, and that sharp declines in asset prices usually reflect 'policy switching' by government or central banks. Those who take this position suggest that the alleged bubble appears to be the result of herd behavior, positive feedback or bandwagon effects – credulous suckers following smart insiders. These critics suggest that the model is 'mis-specified', that is, that something was going on not taken into account by the theory, and that more research is called for.<sup>6</sup> Some of the research ignored by those with this belief is offered in this book.

A more cogent attack on the Minsky model was by Alvin Hansen who claimed that the model was relevant prior to the middle of the nineteenth century but ceased to be so because of changes in the institutional environment.

Theories based on uncertainty of the market, on speculation in commodities, on 'overtrading,' on the excesses of bank credit, on the psychology of traders and merchants, did indeed reasonably fit the early 'mercantile' or commercial phase of modern capitalism. But as the nineteenth century wore on, captains of industry ... became the main outlets for funds seeking a profitable return through savings and investments.<sup>7</sup>

Hansen – who was a foremost expositor of the Keynesian model of the business cycle and especially of persistent high levels of unemployment – sought to explain the business cycle and wanted to downplay the significance of alternative explanations for changes in the level of economic activity. Hansen's emphasis on the importance of the relation between savings and investment does not require the rejection of the view that changes in the supply of credit can have important impacts on the prices of securities and the level of economic activity.

### **The model's relevance today**

The Minsky model can be readily applied to the foreign exchange market and to periods of overvaluation and undervaluation of national currencies that are

associated with 'overshooting' and 'undershooting'. Changes in the foreign exchange values of national currencies have been large relative to long-run equilibrium values despite sizable intervention in the market by central banks. Speculation in foreign currencies has resulted in large losses for some firms and some banks while others have made substantial trading profits.<sup>8</sup>

Consider the growth in the external debt of Mexico, Brazil, Argentina and the other developing countries from \$125 billion in 1972 to \$800 billion in 1982; bank loans to these countries increased at the rate of 30 percent a year and the total external debt of these countries was increasing at the rate of 20 percent a year. The bank loans generally had a maturity of eight years and interest rates were floating and set with a specified markup over the LIBOR, the London Interbank Offer Rate. An average of the interest rates was about 8 percent although they tended to increase throughout the decade. The cash that borrowers received from new loans was substantially larger than the interest payments on their outstanding loans, so in effect they incurred no burden or hardship in making their debt service payments on a timely basis.

The inflow of foreign funds led to a real appreciation of the currencies of the capital-importing countries which was necessary so that the increase in their trade and current account deficits would more or less match the increase in their capital account surpluses. Obviously at some future date the inflow of cash from new loans would decline below the interest payments on the outstanding loans, and at that time the foreign exchange value of their currencies would decline; the counterpart of the decline in the capital inflow was that these countries would need trade and current account surpluses to get some of the cash necessary to pay the interest to their foreign creditors. Most of these borrowers effectively defaulted on their loans when the lenders stopped making new loans. The cost to the lenders of these defaults has been estimated at \$250 billion in the form of the reduction in the face value of the loans and what in effect was a reduction in the interest rates. The lenders had failed to ask the question 'Where will the borrowers get the cash to pay us the interest if we stop supplying them with the cash in the form of new loans?'

During the 1980s real estate prices in Japan increased by a factor of ten and stock prices by a factor of six or seven; in the second half of the decade Japan experienced an economic boom. The rates of return earned by real estate investors appeared to be about 30 percent a year. Business firms recognized that the profit rate on real estate investment was substantially higher than the profit rate from making steel or automobiles or TV sets and so they became large investors in real estate using money borrowed from the banks. Real estate prices were increasing many times more rapidly than rents. At some stage, the net rental income declined below the interest payments on the funds borrowed to buy the real estate and so the borrowers had a 'negative carry'. The borrowers might obtain the funds to make the interest payments by increasing their loans

against some of the properties that they already owned. At the beginning of 1990, the incoming governor of the Bank of Japan instructed the banks to limit the growth in new real estate loans as a share of their total loans. Once the bank loans for real estate began to increase at 5 or 6 percent a year rather than 30 percent a year, some of the firms and investors that needed the cash from new loans to pay the interest on the outstanding loans were no longer able to obtain new loans. They sold real estate and the bubble began to implode.

The current US international financial position in some ways parallels that of Mexico, Brazil and Argentina in the 1970s. These countries had unsustainably large current account deficits and obtained the cash to pay the interest to their foreign creditors from the foreign creditors. The implication is that the US external payments position is not sustainable.

This book is a study in financial history, not economic forecasting. Investors seem not to have learned from experience.

# 3

## Speculative Manias

### Rationality of markets

The word 'mania' in the chapter title suggests a loss of touch with rationality, something close to mass hysteria. Economic history is replete with canal manias, railroad manias, joint stock company manias, real estate manias and stock price manias. Economic theory is based on the assumption that men are rational. Since the rationality assumption that underlies economic theory does not appear to be consistent with these different manias, the two views must be reconciled. The thrust of this chapter is with investor demand for a particular type of asset or security while the next chapter focuses on the supply of credit and changes in the supply.

The 'rational expectations' assumption used in economic models is that investors react to changes in economic variables as if they are always fully aware of the long-term implications of these changes, either because they are clairvoyant or because they have Superman-like kryptonite vision. Thus the cliché that 'all the information is in the price' reflects the view that prices in each market react immediately and fully to every bit of news so that no 'money is left on the table'.

Contrast the rational expectations assumption with the adaptive expectations assumption that the values of certain variables in the future are extensions of these values in the recent past. Thus the cliché that 'the trend is your friend', reflecting the view that if prices have been increasing they will continue to increase. Instead the thrust of the rational expectations view is that the prices that are anticipated next week and next month determine the prices that prevail today, in effect a backward-looking view from the future to the present. Thus the price of gold in the spot market today is the anticipated price of gold at a distant future date discounted to the present by an appropriate interest rate, usually the interest rate on risk-free government securities. The price of the US dollar in terms of the Canadian dollar in the foreign exchange market today is the anticipated price of the US dollar in terms of the Canadian dollar