CHAPTER 1

Introduction to the Evolution of Technical Analysis

From Andrew W. Lo and Jasmina Hasanhodzic, *The Evolution of Technical Analysis: Financial Prediction from Babylonian Tablets to Bloomberg Terminals* (Hoboken, New Jersey: John Wiley & Sons, 2010), Introduction.

Technical analysis—the forecasting of prices based on patterns in past market data—is something of a black sheep in modern economics. Some skeptics view it as kissing cousins with sleazy speculation or gambling, while others regard it as a relic that is only slightly more sophisticated than the reading of chicken entrails. Proponents of quantitative analysis, who take physics as the ideal model of how economic science ought to look, view technical analysis as antiquated and contrived in its very foundations. They demand mathematical proofs of its validity and dismiss as exception bias the strong betting averages and impressive bottom lines of successful technicians. We make it no secret, then, that we regard technical analysis as a legitimate and useful discipline, tarred by spurious associations and deserving of further academic study.

Some of this skepticism is understandable in light of the historical origins (and occasional abuses) of technical analysis. Many of its methods come down to us from the days before computers and the number-crunching-intensive theories they made possible, and not all of its methods have been thoroughly explored within the quantitative frameworks now available. Many terms and concepts in technical analysis can seem abstruse or outmoded; it is easy to see how a discipline that involves eyeballing charts for patterns with names like "head and shoulders" and "cup with a handle" might seem at first blush more akin to astrology than science. However, many of these are merely heuristics developed in the precomputer age when calculating a simple statistic was a formidable task. For instance, the 10-day moving average

became a fixture of technical analysis not because it was optimal, but because it was trivially easy to compute. Indeed, there are many such concepts in "classical" technical analysis that could benefit from quantitative reformulation.

Ultimately, however, both technical and quantitative analysis serve similar purposes: They both attempt to predict the future based on models of the past. One is statistical, the other is intuitive. Whereas a quant minimizes a sum of squared residuals to find the best-fitting line given the data, a technician estimates it by looking at the charts, searching for tell-tale patterns, and inferring the thoughts and feelings of other market players. Both approaches have merit. This is not to say that they are equal; clearly, quantitative methods have won hands down, dominating the investment industry because of their demonstrable value-added. But technical analysis is surprisingly resilient and persistent, and in some corners of the financial industry—such as the trading of commodities and currencies—it is still the dominant mode of analysis. This state of affairs suggests that technical analysis may have something to contribute, even to the most sophisticated quant. Fortunately, a slow but sure reconciliation is underway.

Though big strides have been made throughout history and in recent years toward developing a more systematic approach to technical analysis, technicians remain ostracized to this day. For evidence, look no further than the Financial Industry Regulatory Authority's official recognition of the Chartered Market Technician designation, which occurred only in 2005. Part of the reason is that technical analysis is often associated with the speculators, bear raiders, and market cornerers of previous eras. As Tony Tabell, a veteran technical analyst and an heir to the technical brokerage business founded by his father Edmund Tabell in the 1930s, explains:

> It's hard to visualize unless you've talked to people who were involved how difficult this was in the atmosphere of [the] 1930s and 1940s. The entire brokerage business was a basket case. Volume on the NYSE was under a million shares. This was the 1930s, the Great Depression, nobody had any money, and if they did, they were very leery about investing. Furthermore, technical analysis had been associated with the excesses of the 1920s. All of the various Securities Acts were designed to get rid of the manipulative market operations that had characterized the'20s. Since technical work to a great degree (certainly point and figure charts) had been originally conceived as a means of detecting pool operations, confessing that you were involved in technical work at that point was sort of equivalent to confessing that you were some kind of a low-level criminal. I saw some [of] this, because the remainder of this attitude was still kicking around when I started in the business in the 1950s, but I can imagine how incredible it must have been in the'30s and'40s.[1]

The efficient markets hypothesis (EMH), formulated in the writings of Samuelson (1965) and Fama (1965a,b; 1970), did not help much.[2] According to this theory, there are no patterns in market data that are exploitable through trading strategies.

Ever since the advent of modern finance—a theory based on rational expectations and market efficiency—technical analysis has been dismissed in academic circles as a mathematical impossibility. As Princeton University economist Burton Malkiel concluded in his influential book *A Random Walk Down Wall Street* (1973), "under scientific scrutiny, chart-reading must share a pedestal with alchemy."

As we recount the premature obituaries for technical analysis, it is worth noting as an aside that recent research has not only documented departures from the EMH—in the form of cognitive biases such as overconfidence, overreaction, loss aversion, and herding—but has also included new theoretical underpinnings for technical analysis and the empirical validation of certain technical patterns and indicators.

Malkiel's lumping of technical analysis with alchemy is not entirely coincidental, for here we come across another historical reason for the field's questionable reputation—technical analysis was used in conjunction with astrology since the earliest times. The ancient Babylonians would methodically record, often intraday, the prices of various commodities, but they would also assign those same commodities to the astrological regions of Pisces and Taurus, depending on whether they were bullish or bearish. Similarly, in addition to the very logical lists of weights, measures, and exchange rates recorded in medieval merchant manuals, they also often contained lengthy astrological appendixes and advised their readers to buy, sell, or begin anything when they were in the region of Virgo. Yet another example is provided by Christopher Kurz, a sixteenth-century Antwerp trader, who claimed to be able to forecast prices of commodities up to 20 days in advance using his technical trading system based on back-tested astrological signals.

Such close links between technical analysis and astrology are naturally a cause for suspicion and skepticism today. But for our ancestors, astrology was a way of life, applied to wide-ranging areas of human endeavor including warfare and medicine. It was no coincidence that Christopher Kurz doubled as a political astrologer—he is known for having forecasted the extinction of the papacy, among other things—while Thales of Miletus, one of the Seven Sages of ancient Greece, made meteorological predictions based on movements of the stars and planets. That societies would base their operations in part on astrology sounds absurd today, but interestingly, if we view astrology as a random number generator of the precomputer age, its prevalence becomes more understandable. Then, as now, forecasting—financial and otherwise—was a business of probabilities. Just as computer-generated random numbers are part of today's statistical forecasting models—for example, the commonly used Markov Chain Monte Carlo method for constructing Bayesian forecasts—astrology may be thought of as a random input in ancient forecasting models.

The evolution of technical analysis did not take place in isolation. The growth of markets provided one stimulus for its development. In ancient Babylon, simply writing down commodity prices on clay tablets was sufficient for tracking market action, but with the advent of financial exchanges, the need for visualizing market data became evident. By the 1830s, price charts emerged and soon became so prevalent that people like William Stanley Jevons and James Wyld made their livelihoods from producing sophisticated charts and selling them to various offices.

Speculation provided another stimulus. Though speculation and technical analysis are not synonymous, they do share a certain awareness of market psychology and of the forces of supply and demand. It was precisely when speculative techniques were ripe that technical analysis became more concrete, such as on the Dojima Rice Exchange in seventeenth-century Japan, where the legendary trader Munehisa Homma developed the "candlestick" charting method to be able to visualize open, high, low, and closing market prices over a certain period, and formulated his version of technical analysis, which remains popular to this day.

Despite the distance created by continents and thousands of years, the market wisdom of Charles Dow, the father of modern technical analysis, is astonishingly similar to that of his earliest predecessors, including the ancient Athenian practice of using price level as an indicator of market sentiment, Homma's rotation of Yang and Yin (bullishness and bearishness), and the emphasis in late imperial China on "the ultimate principle," which is that "when goods become extremely expensive, then they must become inexpensive again."[3] Such similarities reveal technical analysis as a truly universal phenomenon and highlight how deeply ingrained it is in human psychology to reason in technical terms in order to ride and reinforce the trends, as was the case with the humble tulip bulb during the 1633–1637 tulip mania in Amsterdam. As de la Vega put it, "for on this point we are all alike: when the prices rise, we think that they fly up high and, when they have risen high, that they will run away from us."[4] As long as humans, not robots, make the markets, bubbles and crashes will be a reality. This is an especially important lesson in the wake of the 2007–2009 global financial crisis, a time when many fundamentals have crumbled and in some spheres of financial practice there has been nothing left to work with other than technical analysis.

In this book, we present a broad, largely nontechnical historical survey of technical analysis, tracing its roots and evolution from ancient times through the medieval and modern eras. While neither of us is a practicing technical analyst or "technician," as they prefer to be called, we have been fascinated by this strange craft for many years, and this volume is the outgrowth of our own attempt to make sense of the discipline. As outsiders, we hope to bring a somewhat different perspective that can bridge the gap between academia and the technical analysis community. Our previous book, *The Heretics of Finance*, contained interviews with leading technicians in which they described their art in their own words. In this volume, we take a more expansive view and search for the origins of technical analysis throughout history.

This endeavor was more challenging than we anticipated because, in many cases, the historical evidence of technical analysis is indirect, and many ideas were not fully developed by their originators. This is not surprising since, in the past, the concept of technical analysis as a separate discipline did not exist; rather, it was entangled with the intuitive, sometimes whimsical, and rarely systematic way of buying and selling practiced by speculators, bankers, and merchants. Hence when we say that merchants were the liberators of the independent human spirit and the driving force behind the progress of world civilization, we mean technicians, too. It was they who put an end to solely monastic education and the use of Latin in business and private life, and who initiated lay education in the Middle Ages. It is no coincidence that some of history's great scientists were also engaged in investing, their market

experiences often motivating their scientific contributions (bonacci being but one example). Sapori once said that medieval merchants "traced for individuals and peoples of all times to come the only way that leads to a full realization of humanity."[5] We hope this book will convey the same for technical analysts across all eras.

Notes

1. A. W. Lo and J. Hasanhodzic, *The Heretics of Finance: Conversations with Leading Practitioners of Technical Analysis* (New York: Bloomberg Press, 2009), 100.
2. Throughout the manuscript, when referencing academic papers in the text, we will use the "author lastname (publication year)" convention commonly followed in the academic finance literature.
3. W. Bingyuan, *Maoyi xuzhi yaoyan* (1900), 15; as quoted in R. J. Lufrano, *Honorable Merchants: Commerce and Self-Cultivation in Late Imperial China* (Honolulu: University of Hawai'i Press, 1997), 133.
4. J. de la Vega, *Confusion de Confusiones* (Boston: Harvard University Printing Office, 1957), 35.
5. A. Sapori, *The Italian Merchant in the Middle Ages* (New York: W. W. Norton, 1970), 38.