

Chapter 3 *Modern Equity Security Valuation*

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What is Knowledge?

Knowledge can be transmitted in a variety of forms. For example, following the tenets of economic positivism, knowledge is obtained by providing the logical development of a desired proposition, starting from initial assumptions and proceeding deductively until the proposition is established. When possible and appropriate, the validity of the proposition is then subjected to empirical verification. This method of obtaining knowledge can be contrasted with, say, the Socratic approach that develops notions using an interrogatory interplay. Various other methods that have been used to transmit knowledge include: the parables of the New Testament; the sayings of Confucius or Sun Tzu; and, the fables of Aesop. Even Grimm's fairy tales or Mother Goose nursery rhymes convey knowledge in a fashion that is different than the 'scientific' approach. Yet, it is difficult to claim that knowledge provided by these different sources does not have comparable value to knowledge obtained using the 'scientific' method. Following Warren Buffett (Cunningham 2002, p.82), it is even possible to go in the other direction and claim that, in the valuation of equity securities, false scientific precision can shed more heat than light on matters of relevance.

3.1 Foundations of Old Finance

A. *Graham and Dodd, Security Analysis (1934)*

Graham and Dodd (1934) is a product of the severe collapse in the corporate securities markets that started in October 1929 and continued until February 1933. This is evident from page one: “Any present examination into financial principles or methods must start with recognition of the distinctive character of our recent experiences, and it must face and answer the numerous questions which these experiences inspire”. For Graham and Dodd, “recent experiences” stretch back to 1927, where the advance to the October 1929 peak is identified as beginning. Words like “unprecedented”, “tidal wave”, “special causes” and “unparalleled effects” are used to describe this period relative to the usual “repetition of business and stock market cycles” that typically characterize stock market price behavior. In contrast, a number of recent studies, e.g., Santoni (1987), Bierman (1991, 1998), have concluded that “overall (the) stock market was not obviously excessively high in September 1929 and the business outlook was favorable. Thus the October crash did not occur because the market was too high” (Bierman 1998, p.17). Such views lend support for the position that Irving Fisher held regarding equity valuations during the crash period.

Were Graham and Dodd incorrect in their observations about security markets events that were, perhaps, too close to be judged accurately? This seems unlikely. If Graham and Dodd were correct, then Bierman and the other observers have misinterpreted the significance of ‘the crash of 1929’ by focusing on the mechanics of common stock valuations surrounding the crash instead of dealing with the role of the crash in contributing to the ongoing collapse of stock market values that continued until February of 1933. Based on analyses starting from Fisher (1930) and continuing to the present, it is evident that theoretically sound rationales for the level that stock prices attained in 1929 can be provided. Yet, consistent with the argument of J.M. Keynes in *The General Theory*, e.g., Chapter 11, the crash acted by changing investor perceptions; it was the severity of the negative shock to the perception of the prospective return to investments that was the key driving factor behind the aggregate economic problems that plagued the industrial world in the 1930's.

Security valuation requires more than a mechanical application of predefined rules. The uncertainty inherent in common stock returns can be resolved in different ways, depending on the impact of the historical context on investor psychology. Graham and Dodd (1934, p.6) clearly recognized this point:

we do not accept the premise that 1927-1933 experience affords a proper norm by which to judge the future of investment. The swing of the speculative pendulum during this period was of such unprecedented amplitude as to warrant the belief that it will not recur in similar intensity for a long time to come. In other words, we should regard it more as an economic phenomenon akin to the South Sea Bubble and other isolated instances of abnormal gambling frenzy than as an indication of what the typical speculative cycle will be. As a *speculative* experience, the recent cycle differed from previous ones in kind rather than degree; but in its effects upon the *investment fabric* it had unique characteristics, seemingly of a nonrecurrent type.

This is by no means an isolated quote, e.g., “One of the striking features of the past five years has

been the domination of the financial scene by purely psychological elements” (p.11). The impact of the historically abnormal previous five years of common stock pricing on the analysis and principles advanced by Graham and Dodd (1934) is systemic, it affects the whole text.

Graham and Dodd were concerned about the inadequacies of an approach to equity security analysis that appeared in the latter part of the 1920's. Graham and Dodd (1934, p.307) referred to this approach as “*The New Era Theory*”:

During the postwar period, and particularly during the latter stage of the bull market culminating in 1929, the public acquired a completely different attitude towards the investment merits of common stocks ... The new theory or principle may be summed up in the sentence: “The value of a common stock depends entirely upon what it will earn in the future.”

From this dictum the following corollaries are drawn:

1. That the dividend rate should have slight bearing upon the value.
2. That since no relationship apparently existed between assets and earning power, the asset value was entirely devoid of importance.
3. The past earnings were significant only to the extent that they indicated what changes in earnings were likely to take place in the future.

This complete revolution in the philosophy of common stock investment took place virtually without realization by the stock buying public and with only the most superficial recognition by financial observers.

Graham and Dodd (1934, p.52) were clear that “the new-era style of investment – as exemplified in the general policy of the investment trusts – was practically indistinguishable from speculation.” For those with the valuations of the NASDAQ-5000 tech stock bubble still fresh in historical memory, these statements by Graham and Dodd (1934) have a timeless quality.

By referring to “a completely different attitude towards the investment merits of common stocks”, Graham and Dodd’s observations about the New Era Theory implicitly make reference to previous approaches to equity security valuation that, presumably, took a more informed view of “investment merits”. As such, Graham and Dodd (1934) represents a revival of the “advance of security analysis (that) proceeded uninterruptedly until about 1927, covering a long period in which increasing attention was paid on all sides to financial reports and statistical data”. The “new era” was a diversion where facts and figures were “manipulated by a sort of pseudo-analysis to support the delusions of the period” (p.14). The reliance on the analysis of financial reports permits a rough correspondence between the development of equity security analysis and the emergence of the professional accountants required to prepare the corporate accounts. “The importance and prestige of security analysis have tended to increase over the years, paralleling roughly the steady improvement in corporation reports and other statistical data which supply its raw material” (GDC 1962, p.24). In the pre-1933 world of security market self-regulation, a professional self regulating accounting profession was needed to ensure that financial reports issued by companies would be a reliable source of information.

Compared to the English security markets, professional accounting was relatively slow to develop in the US. A useful reference date is 1882 when the Institute of Accountants and Bookkeepers was formed in New York state. The Institute issued certificates upon successful completion of a

comprehensive examination. This development was significant because it reflected the growing need for independent accountants to prepare and audit accounts. While, in 1884, there were only 81 independent accountants “listed in the city directories of New York, Chicago and Philadelphia. Just five years later there were 322” (Gordon 1999, p.173). In 1887 the precursor of the modern day American Institute of Certified Public Accountants was established as the American Association of Public Accountants. Recognizing the important role of states in regulating the accounting profession, in 1896 New York state established the legislation that designated criteria for individuals to be qualified to prepare and audit company accounts. This New York legislation, which was soon adopted by other states, is responsible for introducing the term certified public accountant.

Defining Security Analysis

In contrast to Withers (1910), Graham and Dodd (1934) is a significant advancement in terms of depth and breadth of analysis. Seeing that Withers was a financial journalist recounting ideas that he had gleaned from discussions with market practitioners, this is not surprising. By 1934, Graham was a market practitioner, par excellence, with a wealth of personal experience about the practice of security analysis to draw on. In addition, in the quarter of a century separating these two texts there was also a substantive increase in the breadth and depth of available accounting and other statistical information that is an essential ingredient in security analysis. The two texts were also separated by a major security market event, the collapse of security markets from 1929-33. Yet there are enough significant similarities that Graham and Dodd (1934) can be seen to be part of a progression of ideas about security analysis. The seminal status often attributed to Graham and Dodd (1934) is due more to the impact and influence that the text had, rather than to the seminal nature of the ideas being presented.

Graham and Dodd (1934) possesses constant themes that can be found in previous contributions to equity security analysis, such as Withers (1910). These themes include the relevance of the distinction between investment and speculation, the emphasis on the use of financial statements to form opinions, and the problems raised by the vagaries of market pricing. For example, chapter 4 of Graham and Dodd (1934) is dedicated to “distinctions between investment and speculation”. On the vagaries of market pricing, Graham and Dodd (p.23) explicitly recognize that the “intrinsic value” of a security may well differ from the market price:

... the influence of what we call analytical factors over the market price is both *partial* and *indirect* – partial because it frequently competes with purely speculative factors which influence the price in the opposite direction; and indirect, because it acts through the intermediary of people’s sentiments and decisions. In other words, the market is not a *weighing machine*, on which the value of each issue is recorded by an exact and impersonal mechanism, in accordance with its specific qualities. Rather we should say that the market is a *voting machine*, whereon countless individuals register choices which are the product of and partly of emotion.

Together with “inadequate or incorrect data” and “uncertainties of the future”, the “irrational behavior of the market” is a principal obstacle to the success of the security analyst.

In a way, Graham and Dodd deal with the philosophical implications of the process of generating

knowledge in the field of security analysis. Knowledge in the human sciences does not progress in the same linear fashion as in the natural sciences where more theoretical and empirical information is obtained about a given phenomenon. In the human sciences authoritative contributions can be timeless. Graham and Dodd (1934) is an excellent example of this point. To be sure, the historical context has changed since the text was written, but many of the insights still retain contemporary value. Consider the following comment about the objectives of security analysis (p.14):

Analysis connotes the careful study of available facts with the attempt to draw conclusions therefrom based on established principles and sound logic. It is part of the scientific method. But in applying analysis to the field of securities we encounter the serious obstacle that investment is by nature not an exact science. The same is true, however, of law and medicine, here also both individual skill (art) and chance are important factors in determining success or failure. Nevertheless, in these professions analysis is not only useful but indispensable, so that the same should probably be true in the field of investment and possibly in that of speculation.

It seems that in seeking a definition for security analysis, Graham and Dodd were grappling with many of the epistemological issues raised by Gadamer (1960) and others.

In surveying the scope of security analysis, three functions are identified by Graham and Dodd (1934): descriptive; selective; and, critical. Of these, it is the selective function that deals with “whether a given issue should be bought, sold, retained, or exchanged for some other” – the other two functions deal with the preparing of company reports or evaluating the terms and conditions of a particular security issue. For purposes of equity valuation, it is the selective function that is of greatest interest, while the descriptive and critical functions are needed in the process of determining an estimated value, that can be above or below the observed market price. Equity security selection is based on heuristic rules regarding the difference between the estimated value and the market price. This is consistent with equity security valuation and selection methods going back to the earliest trade in joint stocks. Also following a long tradition, Graham and Dodd refer to this estimated value as the ‘intrinsic value’ of the security.

What is “Intrinsic Value”?

In Graham and Dodd (1934) and all later editions, the key element in the selective function is the “intrinsic value” of the security. Significantly, the precise definition of intrinsic value evolved through the various editions. Initially, the concept is proposed in a rather vague fashion: “the intrinsic value is an elusive concept. In general terms, it is understood to be that value which is justified by the facts, e.g., the assets, earnings, dividends, definite prospects, as distinct, let us say, from market quotations established by artificial manipulation or distorted by psychological excesses” (Graham and Dodd 1934, p.17). This is remarkably similar to the notion of “intrinsic value” proposed in Armstrong (1848, p.6-7):

The market price of Securities is principally determined by their intrinsic value, that is, the state of affairs of the Company which the Stocks represent, the amount of dividend which they pay, the state of interest, &c. We say principally, but not entirely. The prices of all

Securities for the investment of Capital, the value and returns being unaltered, are affected more or less by the general condition of the country, as it may be influenced by foreign and domestic affairs, and especially by the state of the money market ... we can draw a distinction between then *natural* elevations and depressions [of market prices] which are inevitable, and those *unnatural* ones which are the effect of design.

As much of Graham and Dodd (1934) is concerned with appropriate methods for determining the intrinsic value of a security, it may seem odd that only a vague definition is proposed. Yet, in adopting a relatively vague definition of intrinsic value, Graham and Dodd (1934) was following a long established line of inquiry.

The origins of 'intrinsic value' determination are not clear. Cantillon used the term in the Essai sur la nature du commerce en général which was written in French around 1730 and published posthumously in English in 1755 (Murphy 1986). Though Cantillon uses the term in relation to determining a par value between land and labour, the analysis is explicitly concerned with the difference between intrinsic value and market price. The connection between the 'intrinsic value' proposed by Cantillon and the modern notion of 'opportunity cost' identified by Thornton (2007) is intriguing. As a prominent financier during the Mississippi scheme and South Sea bubbles, Cantillon was deeply influenced by the workings of the securities market. As in other aspects of the Essai (Poitras 2000, p.401-2), it is possible that concepts gleaned from his activities as a financier were an inspiration for his contributions to political economy. With the appearance of Graham, Dodd and Cottle (1962), intrinsic value is identified with discounted cash flow valuation of equity securities.

Graham and Dodd (1934) is often credited for defining security analysis to mean 'the use of fundamental analysis to value securities issued by publicly traded corporations'. This has led to the mantra: "All security analysis involves the use of financial statements" (e.g., GDC 1962, p. 105). As such, security analysis is intimately connected to accounting practices. Yet, this interpretation of Graham and Dodd is too narrow. Determination of the intrinsic value requires analysis of both quantitative and qualitative factors. Quantitative factors are associated with statistical information from the income statement, balance sheet and additional data on factors such as capacity utilization, unit prices, costs and the like. Qualitative factors include: the nature of the business; the relative position of the company in the industry; physical, geographical and operating characteristics; the character of management; the longer term outlook for the unit, industry and business in general. Precisely how all these elements fit together to form an assessment of intrinsic value is the essence of equity security valuation.

B. Mitchell, Macaulay and the Institutionalists

Founding of the NBER

Close on the heels of the manifesto of institutional economics – Hamilton (1919) – the establishment of the National Bureau of Economic Research (NBER) in 1920 was an important milestone in the emergence of institutionalism as, arguably, the dominant school in American economics in the inter-war period. While institutionalism as an intellectual force was not able to

recover from the post-WW II ‘measurement without theory’ criticism leveled by Koopmans (1947) and others, this school of economic thought made contributions to the conduct of economic policy and government practice that survive to present. Following Rutherford (2001), the institutionalist agenda emerged in the immediate aftermath of WWI and was propelled by a desire to support an enhanced role for government in the economy to achieve much needed social and economic reform. This created a demand for improved economic data and policy analysis that were the touchstones of institutionalism. Proposing a “modern” and “scientific” empirical approach analogous to that used in the natural sciences, institutionalism aimed to replace the theoretically driven neoclassical approach to economics that dominated economics prior to WWI, e.g., Yonay (1994).

While Thorstein Veblen (1857-1929) is often recognized as the “intellectual inspiration for institutionalism” (Rutherford 2001, p.174) and John R. Commons (1862-1945) is credited with playing a key role after 1924, it is Wesley Mitchell that served as a founding father of the movement, as a guiding light during its development and as the originator of the most significant intellectual contribution of the movement, the empirical measurement of business cycles, e.g., Klein (1983). Mitchell received his college education and, in 1899, a doctorate from the University of Chicago. During this time he studied with and was deeply influenced by Veblen, J. Laurence Laughlin (1850-1933), the monetary economist, and John Dewey (1859-1952), the influential philosopher, psychologist and educational reformer. After a brief term at the Bureau of the Census and two years teaching at Chicago, in 1903 Mitchell followed one of his former teachers, Adolph Miller, to the University of California at Berkeley where, apart from a few brief excursions, he stayed until 1912. During this time Mitchell produced Business Cycles (Mitchell 1913) a book which Arthur Burns (1952, p.22) describes as “one of the masterpieces in the world’s economic literature”. Together with Business Cycles: The Problem and Its Setting (1927) and Measuring Business Cycles (1946, with Arthur Burns), these three books are Mitchell’s definitive work on the subject that still epitomizes his career, e.g., Klein (1983).

Mitchell joined the faculty of Columbia University in 1913. Except for a brief period of government service at the end of WWI and three years as a lecturer at the New School for Social Research (1919-1921), Mitchell was a member of the faculty at Columbia until his retirement in 1944. Burns (1952) is a collection of papers on the importance and impact that Mitchell had for so many in the economics profession during his life. In addition to containing fitting tributes to Mitchell, Burns (1952) also contains such a wealth of information on subjects such as institutionalism and business cycle theory that it belongs in the category of a classic book in the history of economic. It was during the New School period that Mitchell was instrumental in organizing the NBER, where he served as Director of Research until he resigned in 1945.

From the founding of the NBER, “the National Bureau was the focus of his intellectual interest, the emotional center of his own work, and the work responsibility that lay closest to his inner life” (Burns 1952, p.102). The NBER was established with grants totaling \$24,000 with which Mitchell was able to hire a small research staff to undertake the first major study on the size, growth, fluctuation and distribution of national income. The initial research staff for the national income study had three members: Willford King, Oswald Knauth and Frederick Macaulay. Though the published results of this study (Mitchell 1921-2) appeared within three years, there were a number of follow-on business cycle projects generated by this initial effort. Among these special studies that got underway in the early 1920's was one on the cyclical fluctuations in interest rates undertaken by

Macaulay (Fabricant 1984).

Frederick Macaulay: the Academic and the Vernacular

Unlike Mitchell who has been the subject of numerous detailed biographical studies, information on the life and times of Frederick Robertson Macaulay is scarce (Poitras 2007). In this regard, Macaulay was not unlike others in the vernacular realm. Macaulay also has some academic significance to the history of institutionalism, due to: his contributions to the NBER project; and, Macaulay (1938) that introduced the concept of 'Macaulay duration'. However, these contributions did not resonate with the later academic Finance community of scholars. As a consequence, Macaulay receives little modern recognition. Frederick Robertson Macaulay was born in Montreal on 12 August 1882, the first born child of Henrietta and Thomas Bassett Macaulay (1860-1942); making him a Canadian by birth, not Scottish or British as reported in some sources, e.g., Spears (2001); Society of Actuaries website (www.soa.org/duration.pdf). Both his grandfather, Robertson Macaulay (1833-1915), and his father were important figures in Montreal business and society. His grandfather served as the second President of the Sun Life Assurance Company of Canada from 1889-1906, resigning the position in favor of his son, T.B. Macaulay who served as the third president of Sun Life from 1906-34.

Though the Macaulay clan has ancestral roots in the Island of Lewis in the Hebrides, his grandfather was born in Fraserburgh, on the northeast coast of Scotland. From humble beginnings, he emigrated to Canada in 1854. Through hard work and his skills as an accountant he entered the life assurance business as a junior accountant with Canada Life Assurance in 1856. After sixteen years at Canada Life, rising eventually to be chief accountant, and a brief stint as Secretary of Mutual Life, in 1874 Robertson Macaulay assumed the position of Secretary at Sun Life. In 1877, his son, T.B. Macaulay joined Sun Life as a junior clerk. In 1880, at the age of twenty, T.B. Macaulay assumed the position of Actuary at Sun Life, the first person to hold such a position within the company. He held this position until 1889 when he assumed the position of Secretary. While Shiu (1990) does recognize that F.R. Macaulay's father served for "many years as the chief actuary at Sun Life of Canada", this attribution is decidedly incomplete. The contributions of T.B. Macaulay to the actuarial profession were such that he is one of only three Canadians in the Insurance Hall of Fame (www.insurancehalloffame.org). He was a charter member and fellow of the Actuarial Society of America and served as president of the Society from 1899-1901. Socially and politically, T.B. was "an important figure in Montreal's closely knit tycoonarchy".

Under the leadership of T.B. Macaulay, Sun Life grew from a relatively small Canadian assurance company to become the largest assurance company in Canada with a presence in 55 countries by the mid-1920's (Schull 1971). He is credited with championing various innovations in assurance policy design, including the unrestricted policy and the automatic premium loan system. T.B. Macaulay also changed the practice of assurance company investment policy. Of particular importance to the history of equity securities, it was under his leadership that, according to Time magazine (Oct. 24, 1932) Sun Life became the "world's biggest investor in common stock". As such, the father of Frederick Macaulay was at the forefront of the 'cult of equity' (Scott 2002) that engulfed the investment practices of insurance companies during the interwar period.¹ Building on contributions to the 'science of investments', May (1912) marks the beginning of a recognition in the insurance industry

that a properly diversified portfolio of common stocks can allow the achievement of average higher yields while mitigating the risk of capital loss due to price volatility.²

With such strong roots in Sun Life and the insurance business, there were undoubtedly strong family pressures for F.R. Macaulay to continue the family calling. Yet, this was not to be. Only his younger brother Douglas was to assume a position within the company, serving in capacities such as supervisor of the Group Assurance department in the early 1920's and later as Assistant Secretary in charge of construction projects. F.R. Macaulay graduated from Montreal High School and entered McGill University in 1900. After attending McGill for two years (1900-1, 1901-2) as an Arts student, Macaulay withdrew without graduating. He was to continue his education at Colorado College in Colorado Springs, transferring to the University of Colorado (CU) in Boulder in 1908, majoring in Economics and Law. He graduated with a B.A. in 1909, an M.A. in 1910 and an LL.B. in 1911. His MA in Commerce (Banking) featured a thesis titled, Money, credit and the price of securities. Macaulay attended law school while he was an undergraduate and a graduate student, which explains how he was able to complete his degrees almost simultaneously. While Colorado may seem an unusual educational destination for someone with the career path that was to follow, it is significant that, in 1906, CU founded a College of Commerce aimed at students wanting to combine higher education with preparation for the business world. As such, CU was one of the first institutions in the US, along with Harvard and Northwestern, to establish such a program.

Though little is known of his activities in the period following his graduation, with his Master's degree Macaulay was able to obtain university positions in economics at the University of Washington from 1915-16 and as an assistant professor of economic theory and statistics at the University of California (UC) from 1916-20. Significantly, alumni records at the University of Colorado indicate that in 1921, he was practising as an attorney at law in Berkeley, California with offices at 2442 Hiyard Avenue. It was during his time at Berkeley that Macaulay made the connection to W.C. Mitchell that was to have such an important impact on his future endeavours. Though Mitchell had left for a position at Columbia prior to Macaulay's arrival at UC, his complementary research agenda and the academic network led Macaulay to decide to pursue a PhD under Mitchell at Columbia. Based on his published contribution to the first major research project undertaken at the newly formed NBER (Mitchell 1921-2), in 1924 Columbia granted Macaulay a PhD in Economics.

Upon arriving at Columbia, Macaulay was able to secure a position on the research staff of the NBER, a position that he held until the completion in 1938 of his special study on the cyclical behavior of interest rates. Because none of the staff of the NBER was paid more than a modest stipend, with senior staff being employed on a part-time basis, it was expected that the bulk of staff income would come from university teaching positions (Fabricant 1984, p.31). To this end, from 1921-26, Macaulay lectured at the New School for Social Research. His area of expertise combined with a growing network of contacts in the financial markets led Macaulay progressively into the business of financial consulting. In 1934, Macaulay joined with Allen M. Bernstein, the father of Peter L. Bernstein to form Bernstein-Macaulay Inc., a New York investment counsel firm. Macaulay served as vice-president of this firm until his retirement in 1961.

In 1967, in a transaction that has been described as the first major deal of Sandy Weill, later to be head of Citicorp, Bernstein-Macaulay became a subsidiary of Carter, Berlind & Weill Inc. (shortly to become Berlind, Weill, Levitt & Cogan Inc. in 1968). Weill served as chairman of this firm from

1965-1984. During his tenure, the firm was subsequently acquired and became part of Hayden, Stone Inc.. Further transactions resulted in the firm becoming, in 1979, Shearson Loeb Rhodes, the second largest brokerage house in the US after Merrill-Lynch. In 1981, this firm was sold to American Express. Peter L. Bernstein joined Bernstein-Macaulay in 1951 and assumed the position of CEO when his father died unexpectedly. He continued in this position until 1973 when he left the firm, by then part of Hayden, Stone to head Peter L. Bernstein, Inc. a financial consulting firm. The following year he participated in the founding of The Journal of Portfolio Management, one of the leading journals spanning the area between academic theory and vernacular practice.

Cowles and Stock Market Forecasting

Alfred Cowles III (1891-1984) is best remembered in modern times for his role in establishing the Cowles Commission (later Foundation) for Economic Research and for the 1871-1939 stock price index that became the basis for the important equity market benchmark S&P index launched in 1957 (Wilson and Jones 2002).³ Cowles is not typically identified with the institutionalist school, despite having similar philosophical goals. In particular, a primary motivation for Cowles to join forces with Irving Fisher and a group of other influential academic economists to form the Cowles Commission in 1932 was the desire to elevate economics into a more precise science using mathematical and statistical techniques. This is consistent with the general goals of institutionalism. Ironically, research developments associated with the Cowles Commission following WWII were central to the demise of the ‘measurement without theory’ form of institutionalism as an intellectual force in modern economics, e.g., Weintraub (2002).

Cowles has gone largely unrecognized in modern times for making other early contributions, particularly to the empirical validity of the efficient market hypothesis for the equity market. Cowles produced two seemingly conflicting contributions. Cowles (1933), updated in Cowles (1944), examines: “the attempts of two groups, 20 fire insurance companies and 16 financial services, to foretell which specific securities would prove profitable ... [and] with the efforts of 25 financial publications to foretell the future course of the stock market”. The objective was to “lead to the identification of economic theories or statistical practices whose soundness has been established by successful prediction” (Cowles 1933, p.309). Observing that the sample period predates Graham and Dodd (1934), the results are still quite remarkable (Cowles 1933, p.323-4):

1. Sixteen financial services, in making some 7500 recommendations of individual common stocks for investment during the period from January 1, 1928, to July 1, 1932, compiled an average record that was worse than that of the average common stock by 1.43 per cent annually. Statistical tests of the best individual records failed to demonstrate that they exhibited skill, and indicated that they more probably were results of chance.
2. Twenty fire insurance companies in making a similar selection of securities during the years 1928 to 1931, inclusive, achieved an average record 1.20 per cent annually worse than that of the general run of stocks. The best of these records, since it is not very much more impressive than the record of the most successful of the sixteen financial services, fails to exhibit definitely the existence of any skill in investment.
3. William Peter Hamilton, editor of the Wall Street Journal, publishing forecasts of the

stock market based on the Dow Theory over a period of 26 years, from 1904 to 1929, inclusive, achieved a result better than what would ordinarily be regarded as a normal investment return, but poorer than the result of a continuous outright investment in representative common stocks for this period. On 90 occasions he announced changes in the outlook for the market. Forty-five of these predictions were successful and 45 unsuccessful.

4. Twenty-four financial publications engaged in forecasting the stock market during the 42 years from January 1, 1928, to June 1, 1932, failed as a group by 4 per cent per annum to achieve a result as good as the average of all purely random performances. A review of the various statistical tests, applied to the records for this period, of these 24 forecasters, indicates that the most successful records are little, if any, better than what might be expected to result from pure chance. There is some evidence, on the other hand, to indicate that the least successful records are worse than what could reasonably be attributed to chance.

While striking, even a casual observer will notice that the particular forecasting sample period, Jan. 1928 to June 1932 is particularly unusual. For this reason, the update provided in Cowles (1944) is of interest.

Cowles (1944) does not replicate Cowles (1933). The sample of only 11 forecasters is much smaller. The 4 financial periodicals and 7 financial services firms that are included also appear in Cowles (1933) making for a much longer Jan. 1928 to July 1943 time series, effectively eliminating the questions raised about the 1928-1932 sample used in Cowles (1933). In addition, Cowles was able to obtain forecast data going back to 1903 for the individual forecaster that exhibited the best forecasting performance of the 11 forecasters over the 1928-1943 sample. Though the forecaster is not named, it is difficult to avoid the conclusion that the forecaster was Roger Babson. The reported results are (Cowles 1944, p.214):

(1) The records of 11 leading financial periodicals and services since 1927, over periods varying from 10 to 15 years, fail to disclose evidence of ability to predict successfully the future course of the stock market.

(2) Of the 6904 forecasts recorded during the 15 year period, more than four times as many were bullish as bearish, although more than half of the period was occupied by bear markets, and stocks at the end were at only about two-thirds of their level at the beginning.

(3) The record of the forecasting agency with the best results for the 15 years since 1927, when tabulated back to 1903, for the 40 years showed results 3.3 per cent a year better than would have been secured by a continuous investment in the stocks composing the Dow-Jones industrial average. Under present laws the capital-gains tax might wipe out most of this advantage. While prospects for the speculator are, therefore, not particularly alluring, statistical tests disclose positive evidence of structure in stock prices which indicates a likelihood that whatever success may be claimed for the very consistent 40 year record is not entirely accidental.

The results supporting (1) are illustrated in Figure 3a. The decidedly more sympathetic tone towards the possibility of profitable stock market forecasting compared to Cowles (1933) is solidified by the closing statement: "A simple application of the 'inertia' principle, such as buying at turning points

in the market after prices for a month averaged higher, and selling after they averaged lower, than for the previous month, would have resulted in substantial gains for the period under consideration.”

INSERT Figure 3.a
Figure 2 from Cowles (1944, p.211)

The tenuous academic connection of Alfred Cowles III with the venerated and academically influential Cowles Commission reflects the sharp division that was beginning to emerge between vernacular and academic Finance. Cowles background was decidedly in the vernacular realm: the grandson of Alfred Cowles, Sr., founder of the Chicago Tribune, his father, Alfred Cowles, Jr., (1865-1939) also served as a manager and director of the Chicago Tribune. For a decade prior to the foundation of the Cowles Commission, Alfred Cowles maintained a private organization for statistical research on problems of investment and finance; partially in support of his activities managing the sizable financial assets associated with the Chicago Tribune fortune. At the time the Cowles Commission was founded, this advisory service was located in Colorado Springs. Despite spending considerable effort monitoring and heeding the advice of leading financial advisory services, Cowles was among those that suffered considerable losses in the equity markets during the 1929-32 period. Deeply troubled by the losses, Cowles set about to establish stock market forecasting on a more scientific basis using mathematical and statistical methods (Christ 1994, p.30-1). The Cowles Commission was the result of these efforts.

Durand and the Rise of Modern Finance

Frederick Macaulay was of sufficient stature in the vernacular community to warrant selection to form an investment advisory firm, Bernstein-Macaulay, in 1934. At this point, the long promised effort that was to be Macaulay (1938) still was not near completion. In practice, Macaulay had few responsibilities within Bernstein-Macaulay and used the time and resources to finish the project. Peter L. Bernstein reports: “When he finally finished the book, Macaulay told my father he could continue to use his name, but he was tired of coming to an office every day and was going to retire” (Poitras 2007). Given his relatively limited duties in the investment counsel business, Macaulay was able to pursue some research activities. After leaving the NBER in 1938, he took up the position of research director with the Twentieth Century Fund for a study commissioned by the New York Stock Exchange on short selling. The final results of this study, Macaulay and Durand (1951), is Macaulay’s last published research contribution. The results of the study are somewhat anti-climatic as short selling was not found to significantly impact price, though some interesting individual transactions are identified.

The connection between David Durand and Macaulay represents the final step in the demise of institutionalism within academic Finance. Like Macaulay, Durand was also a Columbia PhD (1941), attracted by the possibility of working with Mitchell. Earning his B.A. (1934) and M.A. (1938) from Cornell, Durand accomplished the significant academic achievement, prior to receiving his M.A., of publishing a significant article on marginal productivity theory in the prestigious Journal of Political Economy (Durand 1937).⁴ Though Durand became a member of the NBER staff after

Macaulay's departure, Paul Samuelson recounts that, while at the NBER, Durand "pioneered the empirical study of how long-term bonds usually require a higher yield than short. Everyone understands that today, but he was the first to document it" (Szekely and Richards 2004). Given his considerable technical abilities, the NBER connection and the subsequent overlapping work on interest rates, it is not too surprising that Durand and Macaulay would undertake a joint project, such as that on NYSE short selling.

Like so many at the time, Durand's career was interrupted by WWII, where he served in the Naval Reserve, stationed in Hawaii and Guam. Following the war, Durand continued his work with the NBER and the Institute of Advanced Study at Princeton University where he became acquainted with Albert Einstein. Starting as a Research Associate in 1953, Durand obtained the position of Associate Professor at MIT in 1955 and professor in 1958, a position he held until his retirement in 1973. Durand played a recognizable role in the pre-history of modern Finance. For example. Just prior to joining MIT, at an NBER research conference Durand (1952) proposed the then unorthodox position that the financial goal of a firm is to maximize the investment value of the firm rather than to maximize income (Paulo 2003, p.330). In addition, Modigliani and Miller (1958) mention Durand as contributing to the formulation of the MMI theorem. In an interview (Barnett and Solow 2000, p.223), Franco Modigliani observed "listening to a paper by David Durand suggesting (and then rejecting) the so-called 'entity theory' of valuation, I gradually became convinced of the hypothesis that market value should be independent of the structure of financing ... This result later became part of the proof of the Modigliani-Miller theorem."

Given the connection to MIT, strong quantitative training and initial insights into the emerging theories of modern Finance, Durand was a likely candidate to be at the forefront of the emerging scientific background. However, with such strong institutionalist roots, Durand was one of the few in a prestigious academic situation to question the rise of modern Finance, e.g., Durand (1959; 1968). As a consequence of this decision, Durand is best remembered today for the application of statistical methods to problems in corporate finance. Oddly enough, Durand (1957, p.362) represents an important early criticism of discounted cash flow (DCF) valuation. More precisely, Durand make a significant connection between the St. Petersburg paradox and the use of DCF to value growth stocks:

The moral of all this is that conventional discount formulas do not provide completely reliable evaluations. Presumably they provide very satisfactory approximations for high-grade, short-term bonds and notes. But as quality deteriorates or duration lengthens, the approximations become rougher and rougher. With growth stocks, the uncritical use of conventional discount formulas is particularly likely to be hazardous; for, as we have seen, growth stocks represent the ultimate in investments of long duration. Likewise, they seem to represent the ultimate in difficulty of evaluation. The very fact that the Petersburg Problem has not yielded a unique and generally acceptable solution to more than 200 years of attack by some of the world's great intellects suggests, indeed, that the growth-stock problem offers no great hope of a satisfactory solution.

Szekely and Richards (2004; 2005) revive the arguments in Durand (1957) to explain the crash of equity valuations for technology stocks during the market crash of 2000.

In the history of equity security valuation, Durand symbolizes the end within academic Finance of concern with the vernacular problems of practical valuation and market forecasting. From Durand (1959) to Durand (1968), the resistance was considerable but the opposition was too overwhelming. Durand correctly observed that numerous claims being made by “the new finance” were inflated. For example, regarding the claim that the emerging modern Finance approach was based on mathematical logic and supported by quantitative methods Durand (1968, p.848) observes:

What comes first to mind [in considering the difference between the new finance and the traditional], namely the use of mathematics and quantitative methods, will not stand a second thought. The quantitative approach is anything but new in finance; in the hands of actuaries, it dates back to the eighteenth century ... The actuaries have ... greatly contributed to the development of modern statistics, including hypothesis testing.

Similar to Poitras (2000, esp. ch.6; 2006), Durand finds a close connection between the early histories of finance and actuarial science. Such a connection was grossly inconsistent with the claims of ‘scientific revolution’ being made by the founders of the modern Finance school. Decades later on “the fiftieth anniversary of the publication of Harry Markowitz’s landmark paper, ‘Portfolio Selection’” Rubinstein (2002, p.1042) would claim :

With the hindsight of many years, we can see that this was the moment of the birth of modern financial economics. Although the baby had a healthy delivery, it had to grow into its teenage years before a hint of its full promise became apparent. What has always impressed me most about Markowitz's 1952 paper is that it seemed to come out of nowhere.

The division of the academic Finance from the vernacular world of Finance was complete. Those from wanting to keep faith with the vernacular world, such Durand, were irrelevant.

C. Lasting Insights: Graham, Dodd and Cottle (1962)

Even though a portion of Graham, Dodd and Cottle (1962) is material carried forward, unchanged from Graham and Dodd (1934), there is so much more in the 1962 edition that it can safely be considered as a separate text. To be sure, the themes of the two editions are consistent, but so were the themes that connected Withers (1910) with the 1934 edition. One of the features separating Graham, Dodd and Cottle (1962) is the substantive change in the approach to security analysis from the views advanced in the previous editions of 1951, 1940 and 1934. The change is attributed to a change in historical context (p.vi):

Beginning sometime in 1955, our value standards and the actual market level parted company, and the gap has tended to widen through the ensuing years. Thus we are not able to proceed in 1960-1961 with the same comforting assurance as formerly that our standards are in accordance with both long-term and recent-term experience. In this respect we face a three-pronged dilemma, which we share with all serious-minded security analysts. If we persist in clinging to our old, highly conservative standards of common-stock appraisal, we risk not only the certain

charge of old-fogeyism, but a real possibility of failing to recognize important changes in the underlying structure of common-stock values.

Gone is the overwhelming concern with the collapse of investor confidence associated with the pre-WWII period. In its place is a "confident appraisal of the market's future on the general expectation of continued prosperity and growth" (p.417).

Even in the material carried forward, the changes between the 1934 and 1962 editions are more than cosmetic. In particular, where the 1934 edition presented a uniform notion of security analysis, the 1962 edition maintained: "we should acknowledge that there are some serious differences among practicing security analysts as to the basic approach to the selective function of security analysis" (p.25). Speaking of the use of quantitative and qualitative information, the 1934 edition maintained (p.34):

Broadly speaking, the quantitative factors lend themselves far better to thoroughgoing analysis than do the qualitative factors. The former are fewer in number, more easily obtainable, and much better suited to the forming of definite and dependable conclusions. Furthermore, the financial results will themselves epitomize many of the qualitative elements, so that a detailed study of the latter may not add much of importance to the picture. The typical analysis of a security ... will treat the qualitative factors in a superficial or summary fashion and devote most of its space to the figures.

The 1962 edition takes a decidedly different tone about the qualitative factors. Leaving the first two sentences unchanged, the 1962 edition says: "Furthermore, the financial results in themselves epitomize such qualitative elements as the ability of a reasonably long-entrenched management. This point of view does not minimize the importance of qualitative factors in appraising the performance of a company, but it does indicate that a detailed study of them – to be justified – should provide sufficient additional insight to assist significantly in appraising the company" (p.86). Similarly, the 1962 edition advocates: "the weight given to financial material may vary enormously, depending upon the kind of security studied and basic motivation of the prospective purchaser" (p.105).

This emphasis on differences is not meant to imply that the texts are diametrically opposed. For example, on the distinction between speculation and investment the texts are still in agreement. Both editions italicize the statement: "*An investment operation is one which upon thorough analysis, promises safety of principal and a satisfactory return. Operations not meeting these requirements are speculative*" (1934, p.54). Both texts explicitly recognize that security analysis has considerable limitations in speculative situations, e.g., "It is only where chance plays a subordinate role that the analyst can properly speak in an authoritative voice and accept responsibility for the results of his judgments" (1934, p.26; 1962, p.52). In other words, "the value of analysis diminishes as the element of chance increases". Both the 1934 edition and the 1962 edition continues with a discussion about *the benefits of holding a diversified portfolio of securities*: "the element of diversification is counted upon to offset the recognized risk existing in individual securities" (p.54). Insofar as fundamental analysis seeks to benefit from firm specific risks, it would seem the relatively undiversified portfolios would be more attractive. However, the diversification envisaged is much

less than suggested by modern portfolio theory, more along the lines of an investment trust.

In contrast to vernacular orientation of the earlier editions, the 1962 edition was substantively influenced by the emerging academic subject of modern Finance, the early rudiments of which were appearing at that time. There are discussions related to optimal capital structure (p.548-9) and impact of dividend payments on firm value. The discussion about dividends moves from the 'greater benefits to stockholders from dividends' in the 1934 edition to a more ambiguous view in the 1962 edition. There is also chapters dedicated to "newer methods for valuing growth stocks" and "market analysis and security analysis". The 1962 edition is also filled with copious footnotes that contain references to recent journal articles and trade publications. Where the 1932 edition examined fixed income investments and proceeded to common stocks, with a view of applying valuation principles for bonds to common stocks, the 1962 edition has a substantial examination of the principles of financial statement analysis before proceeding to fixed income securities and common stocks. On balance, there is much material presented in the 1962 edition.

Modern students of finance likely would not bother to read the original texts, relying instead on what a long list of journal articles propose as the 'Ben Graham approach'. This approach is typically characterized by *mechanical rules for security selection* using selected financial ratios. Sometimes these rules are taken from the various editions of Graham and Dodd, in other cases from one of the editions of Graham The Intelligent Investor (1949, 1st ed.). For example, Oppenheimer (1981, p.9) identifies four selection criteria for a defensive investor from the five editions of The Intelligent Investor. The rules differ only slightly from edition to edition. The rules from the 1973 edition are: (1) Some dividend paid each year since 1950; (2) the firm has at least \$50 million in assets or annual sales and is in the upper 1/4 or 1/3 of its industry in size; (3) the security price does not exceed 25 times average earnings of the past 7 years and does not exceed 20 times earnings over the last 12 month period; and, the equity at book value is at least 50% of the total market capitalization (for utilities this value is 30%). Oppenheimer also suggests criteria for the enterprising investor, e.g., market capitalization of common stock is two-thirds or less of current assets less total liabilities (including preferred stock).

There are a number of other mechanical security selection criteria that have been attributed to the Graham and Dodd approach. A partial list would include: an earnings-to-price yield at least twice the AAA bond yield; a P/E ratio less than 40% of the highest P/E ratio the stock had over the past five years; a dividend yield of at least two-thirds the AAA bond yield; and, a stock price below two-thirds of tangible book value per share. In addition, Lowe (1994) provides a list of "Ben Graham's investment principles" that includes the following: be an investor, not a speculator; know the asking price; rake the market for bargains; regard corporate figures with suspicion; don't stress out; don't sweat the math; diversify, rule #1, minimum of 25% bonds, 25% stocks; diversify, rule #2, hold a large number of securities; when in doubt, stick to quality; dividends are a clue to value; defend your shareholder rights; be patient; and, think for yourself. Finally, armed with all this background, those seeking to undertake a security analysis need to consider the basic elements of fundamental analysis: profitability; stability; growth in earnings; financial position; dividends; and price history.

Suggested valuation techniques for growth stocks differ substantively from the traditional approach to equity security valuation which has come to be identified as 'value investing'. Graham and Dodd (1934) is justly recognized as a landmark text in the history of traditional equity security analysis.

Much of this first edition appears, sometimes verbatim, in the fourth and final edition of this text, GDC. Being descended from a classic text from the 'old Finance' era, GDC shares the institutional and descriptive characteristics of that pedagogical approach. However, while there are hints of a drift towards the approach of modern Finance in GDC, the overall tone is still clearly from a different tradition. GDC typically proceed employing a heuristic discussion of a particular topic, often illustrated with a number of practical examples using actual securities. Sometimes, usually where there is the potential for confusion in analyzing a particular situation, the discussion is followed by the statement of an investment principle. GDC is characterized by certain themes that permeate the analysis connecting GDC with earlier editions and other texts of traditional equity security analysis such as Dewing (1953) and Graham (1949). However, GDC is more than an expanded discussion of previous works, there are few significant points of evolution and, on occasion, divergence.

From Graham and Dodd (1934) to GDC, a key theme can be summarized as: "All security analysis involves the analysis of financial statements" (GDC, p.105). In contrast, the growth stock approach focuses on the characteristics of the underlying business where analysis of financial statements play a subordinate role. This GDC viewpoint is qualified with the proviso: "the weight given to financial material may vary enormously, depending upon the kind of security studied and basic motivation of the prospective purchaser". However, GDC (p.88) are clear on the relative importance of "quantitative" vs. "qualitative" factors in security analysis. *Quantitative factors* are associated with statistical information from the income statement, balance sheet and additional data on factors such as capacity utilization, unit prices, costs, and so on. *Qualitative factors* include: the nature of the business; relative position of the company in the industry; physical, geographical, and operating characteristics; the character of management; the longer term outlook for the unit, industry and general business. The GDC approach to security analysis is fundamentally concerned with how quantitative and qualitative information is combined. On this point there is an apparent divergence of opinion across the various editions.

Another central theme in is *the distinction between speculation and investment*. This distinction is inherited directly from Graham and Dodd (1934) where the lessons of the stock market collapse of 1929-1933 and the "new era theory" of common stock investing were still fresh in the air. Though concern with the 'new era' theory had been reduced to an historical discussion in GDC, the theme of investment versus speculation persisted: "*An investment operation is one which upon thorough analysis, promises safety of principal and satisfactory return. Operations not meeting these requirements are speculative*" (GDC, p.49). This is an exact repetition of Graham and Dodd (1934, p.54). GDC (e.g., p.51-2) explicitly recognize that security analysis has considerable limitations in *speculative* situations. Security analysis is "an adjunct rather than ... a guide to speculation. It is only when chance plays a subordinate role that the analyst can properly speak in an authoritative voice and accept responsibility for the results of his judgments." By acknowledging limitations in the analysis of speculative securities, the range of common stocks and other securities to which the GDC techniques of security analysis apply is relatively narrow. More precisely, common stocks that have "too many uncertainties about its future to permit the analyst to estimate its earning power with any degree of confidence" are speculative in nature because: "a common stock purchase may not be regarded as a proper constituent of a true investment program unless it is possible to show by some rational calculation that it is worth at least as much as the price paid for it".

Comparing GDC with earlier versions, it is apparent that the weight to qualitative factors in security analysis varies considerably. Graham and Dodd (1934, p.430) maintain: "*Quantitative data are useful only to the extent that they are supported by a qualitative survey of the enterprise*". In contrast, GDC (p.86) maintain that quantitative factors are always an essential element of the analysis:

Broadly speaking, the important quantitative factors lend themselves to much more precise consideration in appraising a specific company than do the qualitative factors. The former are fewer in number, more easily obtainable, and better suited to the forming of definitive conclusions. Furthermore, the financial results themselves epitomize such qualitative elements as the ability of a reasonably long-entrenched management. This point of view does not minimize the importance of qualitative factors in appraising the performance of a company, but it does indicate that a detailed study of them – to be justified – should provide sufficient additional insight to assist significantly in appraising the company.

A further level of ambiguity on this issue is achieved when GDC (p.50) provide an additional criterion for investment: "*An investment operation is one that can be justified on **both** qualitative and quantitative grounds*". This change in emphasis away from qualitative factors towards quantitative factors associated with financial statements was likely due to the substantially increased reliability and availability of this source of information due to historical developments such as the reform of securities laws that occurred around the time Graham and Dodd (1934) appeared.

Another important theme in GDC carried forward from previous editions, but subjected to change, was the concept of "intrinsic value". Whereas Graham and Dodd (1934, e.g., p.17) emphasized the "***intrinsic value***" of a stock and provided heuristic methods for determining this "elusive concept" based on examination of a range of factors such as the record of dividends and the ability of earnings to sustain the dividend, GDC (p.435) adopted the discounted cash flow (DCF) model as the theoretical mechanism for determining the intrinsic value:

The Valuation Process Briefly Described. The standard method of valuation of individual enterprises consists of capitalizing the expected future earnings and/or dividends at an appropriate rate of return. The average earnings will be estimated for a period running ordinarily between five and ten years. In the case of an issue valued as a "growth stock" the projection may be of a terminal year – e.g., four to five years hence – rather than a long term average. The capitalization rate, or multiplier, applied to earnings and dividends, will vary with the quality of the enterprise and will thereby give recognition to the longer-term profit possibilities which cannot be established with precision. Asset values become a significant factor in the appraisal only at the extreme ranges, where either the tangible assets are very low in relation to earnings power value or the net current assets alone exceed the earning power value.

This approach leads GDC to identify the *four basic components of common stock value*: **1. Expected future earnings 2. Expected future dividends 3. Capitalization rates 4. Asset values** . The influence of J.B. Williams on GDC is difficult to ignore.

The GDC (p.438-441) approach to security analysis integrates the price estimates obtained from

the DCF model with the '*margin of safety*' principle and the benefits of diversification: "In our opinion, margin of safety -- in the form of an excess of estimated intrinsic value over current market price -- is a prerequisite to investing in secondary [and primary] shares".⁵ Because the margin of safety is not a guarantee that any given stock will produce a loss, the diversification principle is also required: "A group of, say, twenty or more common stocks will usually average out the individual favorable and unfavorable developments. For this reason, the diversification or group approach is an integral part of the valuation concept itself." GDC (p.448) later clarify this number to between twenty and thirty stocks drawn from a list of not more than 100 "primary" common stocks, i.e., large, prosperous and highly capitalized companies with a strong record of earnings. GDC suggest a further restriction on the amount invested in any one industry. The GDC recommendation that common stock portfolios contain 'twenty or more' high grade common stocks that would be regularly adjusted is a distinct point of contrast with the recommendations of the growth stock approach to equity valuation and selection, e.g., Philip Fisher (1958); Bohmfalk (1960).⁶

Though both the margin of safety and diversification concepts are carried forward from previous editions, there is a decided change in tone in GDC. For example, on the diversification principle, Graham and Dodd (1934, p.320) state: "In our view, the purchase of a single common stock can no more constitute an investment than the issuance of a single policy on a life or a building can properly constitute insurance underwriting." However, GDC (p.55) substantially qualify this view:

There is a well-known argument *against* diversification based on Andrew Carnegie's maxim: "Put all your eggs in one basket and watch the basket". We believe this counsel has an application to security investment but only within its strictest interpretation. An investor may concentrate heavily on the shares of one corporation provided that he has a *personal connection* with it – as an executive or a member of a controlling group. Many large fortunes have been built up over the years by such concentration. But where the close personal connection with the company is lacking that policy rarely works out well. When the choice is in fact a very good one, there is a tendency to sell out at a comparatively early stage in the long-term advance. Any other kind of choice will, of course, appear to be a mistaken one during periods of declining prices.

GDC (p.447-9) also recommend a form of '*tactical asset allocation*' strategy where the composition of the investment portfolio would fluctuate between "an upper limit of 75 percent to be held in common stocks and a lower limit of 25 percent". The proportion held in common stocks at any point in time would be "geared to the analyst-investor's valuation of the DJIA, Standard & Poor's Composite Index, or some other measure of the market". In effect, GDC were advocates of index-tracking market timing strategies. In addition, GDC (p.446) recommend "the sale of holdings that appear definitely overvalued or replacement of less by more attractive stocks." This implies a shorter holding period than the long-term buy-and-hold horizon of Philip Fisher.

GDC were intimately aware of the dramatic progression: in securities markets; in the professional practice of security analysis; and in the emerging theories of modern Finance that occurred between 1934 and 1962. Following J.B. Williams (1938), the acceptance and adoption of *valuation techniques for common stocks based on DCF modeling* was explicitly recognized and rationalized. GDC (p.416) acknowledge the changes that occurred in securities markets, particularly stock markets, during the 1950's, required "new points of view and standards of value":

Our philosophy and its related standards of value were derived primarily from the actual experience of stock investors (and speculators) during many decades prior to the 1950's. They were consistent with stock-market conditions existing at the time our previous editions were published. We think they proved a useful guide to investors from 1934 through 1954. But, ... the latter half of the 1950's brought record high levels in stock prices and with them new points of view and standards of value. It is a difficult task to examine these new levels and standards as they exist at the beginning of the 1960's and to reach some conclusions as to their validity for investment purposes.

Consistent with the proposed use of DCF for common stock valuation, GDC (p.434) criticize the observed practice of doing common stock valuations based on a "too abbreviated forecast of probable future earnings – covering generally only the next twelve months ... value cannot soundly be established on the basis of earnings shown over a short period of time".

3.2 Value Stocks and Growth Stocks

A. Value Stocks versus Growth Stocks

The distinction between value and growth stocks is fundamental to much of modern equity security valuation. Literally thousands of mutual funds investing in equity securities feature 'value' or 'growth' in the fund title to indicate the valuation and selection strategy. At least since Fama and French (1998), the distinction has also featured prominently in published contributions by modern Finance academics. Though the growth stock phenomenon was widely recognized by the end of the 1950's, the basic concept has origins that predate WWII. While growth stocks are not mentioned explicitly in Graham and Dodd (1934), Graham, Dodd and Cottle (1962) (GDC)(p.425-6) recognized a distinct "growth stock approach" to equity valuation and identify a 1938 report by an investment trust, the National Investors Corporation (NIC), that explicitly identified growth stocks as "the most effective medium in the field of common stocks". This view was supported by "economic analysis and practical reasoning". For NIC, growth stocks were "companies whose earnings move forward from cycle to cycle, and are only temporarily interrupted by periodic business depressions". The modern disagreements over what constitutes a growth stock can be found in numerous contributions during the 1950's, e.g., Anderson (1955), Bernstein (1956), Kennedy (1959). GDC (p.427) recommend the definition of Conklin (1958): "a 'growth stock' is a common stock which has recorded or gives promise of recording, a greater than average appreciation in market price over a span of several years".

On the historical evolution of common stocks, GDC (p.56-7) observe:

During the past half-century the investment and speculative characteristics of common stocks as a whole have undergone a series of changes, some of which are as subtle as they are important. Before World War I the typical common stock was basically speculative, for reasons related chiefly to the company itself. The capitalization structure was often top-heavy, the working capital inadequate, the management deficient in various respects, the published information sketchy and unreliable. The junior issue's dividend history was nonexistent or erratic, its

earnings subject to wide fluctuations, and its market action to crass manipulation. Virtually, all these defects have been greatly ameliorated or abolished, as far as today's representative common stocks are concerned.

GDC observe that the improvement in investment potential of common stocks led to “an upgrading in the public standing of common stocks generally”, leading to the mis-perception that many ‘speculative’ issues are actually of ‘investment’ quality. This mis-perception had been complicated by the rapid pace of technological change that created the ‘growth stock’ and led to more rapid erosion in the core business of certain ‘primary’ stocks due to an inability to adapt to the pace of change. This *technological growth factor* “is not amenable to dependable prediction” and, as a consequence, stocks in the growth category are “fundamentally speculative”. In contrast to Philip Fisher, GDC also maintain that the quality of the company alone is an insufficient indication of value without also considering the common stock price: “Strictly speaking, there can be no such thing as an ‘investment issue’ in the absolute sense, i.e., implying that it remains an investment regardless of price” (GDC p.50).

Though GDC is generally a more sophisticated and developed treatment of security analysis than Graham and Dodd (1934), there are a number of points where GDC failed to recognize the value contained in the earlier edition and dropped material that still had considerable insight. The discussion of the ‘new era’ theory is one of these cases. Graham and Dodd (1934, p.307) provide the following description:

During the post [WWI] war period, and particularly during the latter stage of the bull market culminating in 1929, the public acquired a completely different attitude towards the investment merits of common stocks. Two of the three elements [suitable and established dividend record and a satisfactory backing of tangible assets] lost nearly all of their significance and the third, the earnings record, took on an entirely novel complexion. The new theory or principle may be summed up in the sentence: “The value of a common stock depends entirely upon what it will earn in the future”.

From this dictum the following corollaries were drawn: 1. That the dividend rate should have slight bearing upon the value. 2. That since no relationship apparently existed between assets and earning power, the asset value was entirely devoid of importance. 3. That past earnings were significant only to the extent that they indicated what *changes* in the earnings were likely to take place in the future.

This complete revolution in the philosophy of common-stock investment took place virtually without the realization by the stock-buying public and with only the most superficial recognition by financial observers.

It is difficult for a modern observer of equity markets to read these words and not be struck by the similarity of the ‘new era’ theory to the common stock valuation philosophy appeared during the technology/dot.com bubble that started around 1995 and continued to early 2000, e.g., the “Gorilla Finance” of Moore et al. (1999). Writing in the early 1960's when concerns with the stock market collapse of 1929-1933 had largely faded from view, instead of a close examination of the ‘new era’ theory all GDC (p.57) could muster was a concern about “the shift of investment emphasis from

values established by the past record to values to be achieved *solely* by future growth ... we are skeptical of the ability of all but the most gifted analysts to chart with precision the growth rate of a given company for many years ahead.”

As astute observers of ‘real-time’ security markets, GDC were acutely aware of the growth stock phenomenon and of the implications that the views of growth stock proponents, such as Philip Fisher, had for the ‘Graham and Dodd’ approach to security analysis, e.g., Poitras (2005, ch.7). An acknowledged limitation of the GDC approach is the inability to deal with ‘speculative’ securities. Technology driven growth stocks are viewed by GDC as ‘fundamentally speculative’. Despite this, GDC (p.57) give considerable attention to the emergence and assessment of growth stocks propelled by “the rapid stepping up of technological change”:

This has created opportunities for spectacular growth of profits for many companies, but it has also threatened the position of many others which have fallen behind in the technological race. To some degree these contrary occurrences can be projected well in advance by an unusually competent analyst who does some penetrating research of his own. But, broadly speaking, we think that modern technology has injected an important new factor in the affairs of many companies, which is not amenable to prediction and which for that reason must be recognized as fundamentally speculative.

While explicitly recognizing that “there have been investors capable of making [growth stock] selections with a high degree of accuracy and that they have benefitted hugely from their foresight and good judgment”, GDC (p.426) question “whether or not careful and intelligent investors as a class can follow this policy with fair success”.

For GDC, growth stocks present three related questions that require addressing: “First, what is meant by a ‘growth company’? Second, can the investor identify such companies with reasonable accuracy? Third, to what extent does the price paid for such stocks affect the success of the program?” GDC (p.425-33) give detailed attention to discussing these questions about growth stocks. The possibility of ‘growth industries’ is admitted with “aluminum, electronics, drugs, office equipment, paper, and some branches of chemical manufacture” being explicitly identified. Not surprisingly, GDC are unable to shed much light on the subject. According to GDC, ***growth stocks are difficult to define, difficult to identify and difficult to tell if the price is too high***. The prognosis for growth stocks is cloudy: “if the analysis of growth stocks is pursued with skill, intelligence, consistency and diligent study, it should yield satisfactory results.” However, “it must represent the activity of a strong-minded and daring individuals rather than investment in accordance with accepted rules and standards”. The incongruence between the ‘Graham and Dodd’ and the ‘growth stock’ approaches is apparent. It follows that, to get an accurate appreciation of security analysis and investment strategy for growth stocks, a leading ‘advocate’ of the approach, such as Philip Fisher, needs to be examined.

B. The Growth Stock Philosophy

Though the basic concept of growth stock valuations in the trade has origins that predate WWII, among old Finance academics the growth stock phenomenon was widely recognized by the end of

the 1950's, e.g., Clendenin and van Greave (1954); Durand (1957). It was deductively demonstrated that applications of traditional discounted cash flow analysis to valuation of growth stocks created substantive problems, e.g., Durand (1957, p.362):

With growth stocks, the uncritical use of conventional discount formulas is particularly likely to be hazardous; for, as we have seen, growth stocks represent the ultimate in investments of long duration. Likewise, they seem to represent the ultimate in difficulty of evaluation ... the growth-stock problem offers no great hope of a satisfactory solution.

In the absence of a plausible solution to the equity valuation problem using discounted cash flow techniques, progress on valuation of growth stocks was confined largely to heuristic and anecdotal contributions contained in trade publications. Bohmfalk (1960, p.122) observe:

With growth stocks, the chief element of risk is a possibility of a change in the rate of growth of a company, and this possibly may be related to new technological developments or to a change in management. So the new growth stock philosophy demands some considerable technical competence on the part of the investor in appraising scientific enterprise on the part of the investor in appraising scientific enterprise and management.

Among the various growth stock prognosticators of this era, the contributions of Philip Fisher have been recognized for specific attention, e.g., Poitras (2005, ch.7).

To be clear, P. Fisher was not the originator of the '*growth stock*' approach. Rather, Fisher is selected based on largely anecdotal information on the performance of his privately managed equity portfolios. Fisher entered the investment industry somewhat later than Graham, though he did have substantive exposure to the 'Great Bull Market of the 1920's' having entered the fledgling Stanford Business School as a first year student in 1927-8. Though he started his own investment firm, Fisher & Company in 1931, this venture was a from-scratch startup in San Francisco by a young entrepreneur with little market experience. While the appearance of Graham and Dodd (1934) solidified Ben Graham's already considerable reputation in the New York financial community, by 1935 Fisher was just stabilizing his client list and achieving a small measure of success. It was not until the 1950's that Fisher rose to national prominence as a security analyst, a reputation that was solidified by Fisher (1958) a book that marks the beginning of systematic identification of the investment characteristics of 'growth' stocks. Even though the investment philosophies of both Graham and Fisher were greatly influenced by events surrounding the Great Bull and Great Bear Markets of the late 1920's and early 1930's, there is a distinctly different flavour to their approaches to equity security valuation and investment strategy.

The popularity of Fisher (1958) in the practical valuation of equity securities is due, at least partly, to the fashion in which the material is presented. Fisher was fond of providing point form summaries of his approach to investment analysis. In Fisher (1958), *fifteen key questions* are provided that need to be answered satisfactorily before a common stock is purchased. These questions, which are similar to those found in Fisher (1975) can be summarized as:

'1. Do the company's products or services have sufficient market potential to make possible a

significant ***increase in sales*** for at least several years?’

‘2. Does the management have a desire and savvy to continue ***developing products or processes*** that will further increase total sales potential when the growth potential of current product lines have largely dissipated?’

‘3. In relation to company size, how effective are the company's ***research and development*** efforts?’

‘4. Does the company have an effective and efficient ***sales organization***?’

‘5. Does the company have a viable ***profit margin***?’

‘6. What is the company’s strategy for maintaining or improving this profit margin?’

‘7. Does the company have superior ***labor and personnel*** relations?’

‘8. Does the company have superior relationships among the ***executives***?’

‘9. Does the company have strength and depth in its management structure?’

‘10. Does the company have adequate cost analysis and ***accounting controls***?’

‘11. Are there other aspects of the business, specific to the industry, that will give the security analyst important clues to identifying if the company is outstanding in relation to its ***competition***?’

‘12. Does the company have an adequate short-range or a ***long-range profit outlook***?’

‘13. Is there potential common stock ***dilution*** in the foreseeable future, i.e., will the growth of the company require additional equity financing that will dilute the existing common stockholders' benefits from future anticipated growth?’

‘14. Does the ***management*** willingly provide details about company activities when things are going well, but are reluctant to talk when troubles and disappointments occur?’

‘15. Is the company management of unquestionable integrity and ***honesty***?’

By themselves, these questions are useful, if not overly revealing. The strength of Fisher (1958) is in the discussion and anecdotes that illustrate these various questions. In contrast to the Graham and Dodd (1934) view that ‘all security analysis involves the examination of financial statements’, it is apparent that Fisher is ‘focussed’ on the characteristics of a company. The general approach can be summarized in the quote: “I don't want a lot of good investments; I want a few outstanding ones.”

INSERT Table 3-w

Philip Fisher’s Eighteen Common Stocks

The essence of Fisher’s approach is captured in Table 3-w that reports the price performance of eighteen stocks recommended in Fisher (1958) over the subsequent 26 months. Most attention is given to the remarkable ratio of the equally weighted average return to the return on the Dow Jones industrial average. While the Dow was able to gain a quite remarkable 40% over the less than two year period, Fisher’s stocks increased 2.82 times more at 113%. As 9 of the stocks are considered to have capitalization large enough to be sufficient for significant institutional trading and 4 more are close to that status, it is not possible to explain such results by claiming the Fisher portfolio achieved the returns due to a ‘higher beta than the market’. What a focus on the global portfolio performance obscures is ***biases in Fisher’s individual stock selection*** to companies in certain types of industries. Seven of the eighteen companies are either completely in or have significant exposure

to the chemical industry, eight if the battery maker P.R. Mallory is included. Four companies had exposure to the fledgling computer industry, five if Ampex is included because magnetic tape played a significant role in early computer storage. Stock grouping, such as resource companies, do not enter the mix.

Though at the time still actively involved with his firm, Fisher (1980) was written when Fisher was well past the conventional age of retirement. The short monograph provides *key points in Philip Fisher's investment philosophy*. The key points are summaries, buttressed with practical, hands-on discussion of the various points using examples from his personal experiences. The accompanying discussion is short and largely autobiographical. The first point deals with the elements of the 15 points from Fisher (1958) and the first three dimensions of Fisher (1975):⁷

- 1) Buy into companies that have disciplined plans for achieving dramatic long-range growth in profits and that have inherent qualities making it difficult for newcomers to share in that growth.
- 2) Focus on buying these companies when they are out of favor; that is, when, either because of general market conditions or because the financial community at the moment has a misconception of its true worth, the stock is selling at prices well under what it will be when its true merit is better understood.⁸
- 3) Hold the stock until either (a) there has been a fundamental change in its nature (such as a weakening of management through changed personnel), or (b) it has grown to a point where it no longer will be growing faster than the economy as a whole. Only in the most exceptional circumstances, if ever, sell because of forecasts as to what the economy or the stock market is going to do, because these changes are too difficult to predict.
- 4) Making some mistakes is as much an inherent cost of investing for major gains as making some bad loans is inevitable in even the best run and most profitable lending institution. The important thing is to recognize them as soon as possible, to understand their causes, and to learn how to keep from repeating the mistakes.
- 5) For those primarily seeking major appreciation of their capital, de-emphasize the importance of dividends. The most attractive opportunities are most likely to occur in the profitable, but low or no dividend payout groups.
- 6) There are a relatively small number of truly outstanding companies. Their shares frequently can't be bought at attractive prices. Therefore, when favorable prices exist, full advantage should be taken of the situation. Funds should be concentrated in the most desirable opportunities.

Given this general background, Fisher provides a variety of directions, clarifications and explanations to aid in the identification and valuation of growth stocks.

The desire to purchase targeted stocks as cheaply as possible is common sense and is found in virtually all analyses of securities trading and investment activities. The view is not unique to Fisher and GDC. Unlike GDC, Fisher does feel that if the company is good enough then buying the

common stock is recommended when it is fairly valued in line with the fundamentals. In advocating the use of intrinsic value and the margin of safety principle, GDC would seem to be in disagreement with this recommendation, per se, but this could be due to a difference in semantics. Fisher is *using the P/E ratio to measure value*, i.e., the fourth dimension, while GDC is using DCF to measure intrinsic value. Presumably, Fisher is implying that the growth in earnings from companies that have the strongest fundamentals is not being fully captured by the *P/E*. Where Fisher is saying the *P/E* fairly reflects fundamentals, GDC could say that the intrinsic value is low enough to qualify for purchase using the margin of safety principle. However, the difficulties of estimating the future cash flows for the types of companies Fisher's first three dimensions identify may mean that GDC would not advocate a purchase.

While there are possible interpretations that would have Fisher and GDC agreeing on criteria for purchasing common stocks, on *the issue of when to sell* there is unambiguous disagreement. GDC want to purchase common stocks that have the estimated intrinsic value less than the price by the margin of safety. These stocks are then held until an overvaluation is observed and then the stock is sold. In contrast, Fisher (1975, p.43) is a long-term buy and hold investor in favor of retaining stocks "even though their prices seem too high. If the fundamentals are genuinely strong, these companies will in time increase earnings not only enough to justify present prices but to justify considerably higher prices." For Fisher there are only a small number of companies that genuinely qualify for selection using the first three dimensions. Selling such companies because the price reflects an 'overvaluation' implies that there are similar companies available for purchase that are 'undervalued'. Yet this is unlikely due to the small number of such companies. Parking the money from the sale in cash and waiting for a pull back in price requires illusive market timing skills: "it is my observation that those who sell stocks to wait for a more suitable time to buy back these same shares seldom attain their objective."

What specific criteria does Fisher propose for when to sell a successful stock? In addition to emphasizing 'never sell the most attractive stocks you own for short-term reasons', Fisher does recognize that, as companies grow, small companies that were efficiently run may fail to change management style to meet the different skill set that big companies need. The upshot is that, if management fails to grow as companies grow, shares should be sold. Fisher proposes a '**three year rule**' for any new purchase. If the company has not achieved the objectives set out when the stock was purchased, then it is time to consider selling. Fisher basically wants to get in relatively early in the company growth cycle and hold onto the stock until the company has reached the point where future growth is problematic, always keeping a close eye on the first three dimensions. If the initial analysis is later found to be faulty, the position has to be unwound, but sufficient time has to be allowed for the company fundamentals to play out.

From Graham and Dodd (1934, ch.29) onward, the 'Graham and Dodd' approach has struggled with the importance of dividends: "From one point of view, the dividend rate is all-important; but from another and equally valid standpoint it must be considered an accidental and minor factor" (Graham and Dodd, p.324). Similarly, GDC (p.487) maintain: "The quality of common stock, which reflects itself in the multiplier applied to current or prospective earnings and dividends, is in most cases largely determined by the dividend record". Yet, GDC (p.488) are willing to accept: "that a fundamental difference may exist between the appropriate payout policy for average and subaverage companies and that for the exceptional growth issue." Shareholders in growth companies will be

better off if the company maintained a policy of complete retention of earnings. Recognizing the potential validity of the Miller and Modigliani (1961) argument on dividends (see sec. 2.4), GDC observe that ‘synthetic’ dividend cash flows can be obtained by selling a fraction of the stock if desired. In addition, low or no dividend payout can have potential tax advantages for many stockholders due to the lower tax rate on capital gains vs. dividend income.

Fisher recognizes that outstanding companies will often have a real need funds to finance expansion. As a consequence, Fisher identifies *low dividend payout aspect of the growth stock* profile. This view is also identified in modern Finance as being consistent with a desirable company characteristic advanced by ‘growth stock’ advocates such as Fisher. However, this aspect is not a necessary condition for Fisher (1975, p.72): “As long as dividend policy is consistent, so that investors can plan ahead with some assurance, this whole matter of dividends is a far less important part of the investment picture than might be judged from the endless arguments frequently heard about the relative desirability of this dividend policy or that ... dividend considerations should be given the least, not the most, weight by those desiring to select outstanding stocks.” Retained earnings can just as easily be used to “enlarge the inefficient operation rather than to make it better.” Allowances for increases in the capital stock can in some cases be achieved through depreciation rates.

Portfolio composition is another key point of difference between growth stock proponents, such as Fisher, and traditional value investors, such as GDC. What is the optimal number of securities to own? On this point Fisher (1980) observes: “For individuals (in possible contrast to institutions and certain types of funds), any holding of over twenty different stocks is a sign of financial incompetence. Ten or twelve is usually a better number.” While Fisher does make allowance for “the costs of the capital gains tax” impacting the time to achieve a “complete a move towards concentration”, the basic result is the same: “As an individual's holdings climb toward as many as twenty stocks, it nearly always is desirable to switch from the least attractive of these stocks to more of the attractive.” Whereas GDC recommended holding 20-30 stocks which are rebalanced on a regular basis, Fisher maintains that for individual investors this number is so large as to be “*a sign of financial incompetence*”. There is some need to diversify across industries and in cases where the holdings are in venture capital or small cap situations. The bulk of these holdings will be of the long-term buy-and-hold variety.

To adherents of the ‘efficient diversification’ approach of modern Finance, *the approach of holding a narrow stable of winners* will appear to be foolish and misguided. Yet, this approach is not unique to Fisher and can be found in other successful members of the trade. For example, Loeb (1935; 1965, p.11) observes: “Diversification is a necessity for the beginner. On the other hand, the really great fortunes were made by concentration. The greater your experience, the greater your capability for running risks, and the greater your ability to chart your course yourself, the less you need to diversify”. Given this, Fisher does maintain that some degree of diversification across industries (and possibly countries) is essential. Hyper-selective growth stock valuation and selection strategies, such as the Moore et al. (1999) gorilla game that preaches investment only in selected technology stocks, would not be advisable from Fisher’s growth stock perspective. The degree and extent of diversification is a slippery slope that marks a major point of divergence between the views of GDC, growth stock traditionalists, such as Fisher, and the modern growth stock proponents of the technology bubble.

C. The Warren Buffett Synthesis

Often described as the world's greatest investor, Warren Buffett has developed an approach to equity valuation that synthesizes the traditional GDC 'analysis of financial statements' approach with the 'focus on the company characteristics' of the growth stock approach, e.g., Lowenstein (1995). Given the well known relationship between Buffett and Graham, the connection to the Fisher growth stock approach is apparent in various Buffett writings such as (Cunningham 2002, p.100-1):

Your goal as an investor should simply be to purchase, at a rational price, a part interest in an easily-understandable business whose earnings are virtually certain to be materially higher in five, ten and twenty years from now. Over time, you will find only a few companies that meet these standards – so when you see one that qualifies, you should buy a meaningful amount of stock. You must also resist the temptation to stray from your guidelines. If you aren't willing to own a stock for ten years, don't even think about owning it for ten minutes. Put together a portfolio of companies whose aggregate earnings march upward over the years, and so also will the portfolio's market value.

While there is some overlap in the basic notions advanced by Graham and Fisher, it is on selecting appropriate points of emphasis and divergence that Buffett was able to arrive at a successful synthesis of the two approaches to equity valuation. For example, Graham proposed methods of determining whether common stock prices were selling below intrinsic value, emphasizing the use of financial statements. In contrast, Fisher is concerned with the characteristics of the business, emphasizing the quality of management and the company's ability to generate sales and profits. Basic Buffett security selection dictums like searching for businesses with excellent management, focussing on a small number of core holdings (because there are only so many outstanding companies) and 'buy a business not a stock' are more echoes of Philip Fisher than Ben Graham, though Graham did make passing reference to these concepts as well.

Buffett starts from the Graham and Dodd view that securities have an intrinsic value and that for a number of reasons, the prices of securities may not trade at intrinsic value creating trading opportunities. Following Williams (1938), Buffett advocates the use of the discounted cash flow model to estimate the intrinsic value. In order to overcome the difficulties of estimating the future cash flows, Buffett recommends examining only businesses that the analyst is capable of understanding: "You don't have to be an expert on every company or even many. You only have to be able to evaluate companies within your circle of competence. The size of the circle is not very important; knowing its boundaries, however, is vital" (Cunningham 2002, p.100). Once the cash flows have been determined, the margin-of-safety principle is used to decide whether the security is a buying opportunity. Because there are only a few companies that will meet the appropriate criteria, a Buffett portfolio for a retail investor will have few securities and be relatively inactive in trading.

INSERT Table 3-a Performance of Berkshire vs S&P 500
 INSERT Table 3-b List of Berkshire Hathaway Subsidiary Companies

Examining the evolution of security analysis as reflected in the different editions of Graham and Dodd, it is apparent that the historical evolution of security markets has a profound impact on the prescriptions of security analysis. For example, whereas in the pre-WWII period it was possible at various times to identify significant numbers of companies with common stock prices trading below the net current asset value per share, such companies are relatively uncommon in current US stock markets. Where such situations are available, this is, more likely than not, a situation that is to be avoided because the large balance of net current assets is likely being soldiered to stave off an impending sequence of negative earnings. While the views of GDC and Fisher may have provided considerable insight into securities markets of earlier times, there is no assurance that markets have not evolved beyond the lessons contained in those texts. This speaks to the importance of the Warren Buffett synthesis. Buffett has obtained his track record more recently and, as such, his prescriptions are relevant to contemporary observers. To this end, Table 3-a provides evidence on the performance of Berkshire-Hathaway vs. the S&P 500 and Table 3-b provides a listing of the companies in which Berkshire Hathaway currently has a substantial position.

Hagstrom (1995, 2000) has summarized the '*Buffett approach to investment*' into five principles. Though these principles do not do full justice to Buffett's value investing prescriptions, e.g., Cunningham (2002), the basic structure is sound.⁹ These principles can be briefly summarized as:

1. Don't follow the day-to-day fluctuations in the stock market. The market is a forum for buying and selling, not for precisely setting value. Investors need to be able to ignore significant short-term reductions in the value of a common stock. Follow the market only when the objective is to sell a stock at prices well in excess of intrinsic value.
2. Don't try to predict the direction of the general economy. If the stock market cannot be predicted, then how is it possible to predict the economy?
3. Buy a business, not its stock. A stock purchase can be viewed as though the entire business is being purchased. Four important elements apply to valuing the business: business characteristics, management, financial numbers and value. Business characteristics include: the business needs to be simple and understandable to the investor and the business needs a consistent operating history and favorable long-term prospects. The management has to be honest, capable and candid with shareholders. Management with a high fraction of personal wealth invested in a company, e.g. Buffett and Munger at Berkshire-Hathaway, have a greater incentive to manage effectively. Key financial numbers to examine are return on equity, as opposed to earnings per share, profit margin and the ability to add value with retained earnings (return on additions to equity greater than cost of capital).
4. Buffett requires the intrinsic value to be less than the market price by the margin of safety for a security to qualify as an eligible purchase.
5. Manage a portfolio of businesses – act like a business owner rather than a stock trader. The implication is that being widely diversified is inconsistent with being able to manage so many businesses.

In addition to these general principles, Buffett is credited with numerous interesting quotes such as: “It is just not necessary to do extraordinary things to get extraordinary results” and “As far as I am concerned, the stock market .. is there only as a reference to see if anybody is offering to do anything foolish”.

INSERT Table 3-c BH “Acquisition Criteria”

Despite all the reverence given to Buffett as the proto-typical value investor, it is apparent that individual investors would have difficulty pursuing the types of strategies that have brought considerable success to Berkshire Hathaway. For example, consider the “**Acquisition Criteria**” in Table 3-c that is published annually in the Berkshire Hathaway annual report. This buy-a-business approach is reiterated in Buffett’s various writings. The following statement is contained in the Berkshire-Hathaway (2003, p.69) 2002 annual report:

Our preference would be to reach our goal [of maximizing Berkshire’s average annual rate of gain in intrinsic value on a per-share basis] by directly owning a diversified group of businesses that generate cash and consistently earn above-average returns on capital. Our second choice is to own parts of similar businesses, attained primarily through purchases of marketable common stocks by our insurance subsidiaries. The price and availability of businesses and the need for insurance capital determine any given year’s capital allocation.

While it would be nice for individual investors to be able to search out companies and take a 100% interest, this is not practical for all but the select few investors (see Table 3-b again). The detailed emphasis on business characteristics, which usually requires on-site visits and access to senior management, also makes it difficult for individual investors.¹⁰ In this regard and in the general approach to detailed fundamental analysis of the business, Buffett has much more in common with Philip Fisher than Graham and Dodd.

Being a practitioner rather than an academic, the folksy writing style that characterizes Buffett’s published contributions often makes it difficult to untangle the analytical recommendations aimed at making 100% acquisitions from those associated with making fractional purchases of companies using common stock. However, this observation relates to the part of the Buffett synthesis that has a close connection to Philip Fisher, i.e., the economic analysis of the underlying business. Buffett’s approach to fundamental analysis also has a component that is closely related to Ben Graham. Whereas Philip Fisher concentrated on business characteristics, for the Graham and Dodd approach: ‘all security analysis involves the analysis of financial statements’. Unlike Fisher, who did not proceed much beyond the *P/E* ratio, profit margin and sales growth in the level of financial statement analysis, Buffett provides considerable insight into using financial accounting to identify investment opportunities (Cunningham 2002, p.185): “In our own investing, we search for situations in which both [business analysis and financial statement analysis] give us the same answer.”

Buffett’s insights into the ***use of accounting numbers in business valuation*** are generally unrecognized. Yet, this aspect of the Buffett synthesis may be the most impressive and useful to individual investors. Buffett explicitly recognizes the importance and limitations of accounting

numbers (Cunningham 2002, p.213):

Accounting numbers, of course, are the language of business and as such are of enormous help to anyone evaluating the worth of a business and tracking its progress. Charlie and I would be lost without these numbers; they invariably are the starting point for us in evaluating our own businesses and those of others. Managers and owners need to remember, however, that accounting is but an aid to business thinking, never a substitute for it.

Because the most important source of information for Buffett's views is the Annual Reports and Letters to Shareholders of Berkshire-Hathaway, many of the comments are addressed to accounting aspects of that company. This means giving detailed attention to accounting for taxation, acquisitions and for different levels of ownership in the various companies that comprise the Berkshire-Hathaway holding company.¹¹ However, there are also a number of general observations about accounting that appeal to a wider range of applications.

Buffett recognizes the failings of conventional interpretations of accounting numbers and related valuation measures (Cunningham 2002, p.218): "Common yardsticks such as dividend yield, the ratio of price to earnings or to book value, and even growth rates have *nothing* to do with valuation except to the extent they provide clues as to the amount and timing of cash flows into and from the business". A common theme in Buffett's writings is that reference to 'growth' and 'value' strategies reflect an ignorance of the valuation process. Growth can destroy value if the cash required to increase assets exceeds the cash generation of those assets in the future. For Buffett:

The primary test of managerial economic performance is the achievement of a high earnings rate on equity capital employed (without undue leverage, gimmickry, etc.) And not the achievement of consistent gains in earnings per share. In our view, businesses would be better understood by their shareholder owners, as well as the general public, if managements and financial analysts modified the primary emphasis they place on earnings per share, and upon yearly changes in that figure.

Earnings are too readily manipulated by unscrupulous management or misinterpreted by naive investors. The use of GAAP accounting does not ensure a meaningful earnings number, only that the earnings number is calculated according to 'generally accepted accounting principles': "managers and investors alike must understand that accounting numbers are the beginning, not the end, of business valuation".

Buffett clearly states that the object is to maximize 'economic earnings' and not 'accounting earnings'. This point is not original to Buffett. What Buffett brings to the table is the invaluable interpretations of an individual who has accumulated a remarkable record from understanding the difference. One example concerns 'economic goodwill' versus 'accounting goodwill': "You can live a full and rewarding life without ever thinking about Goodwill and its amortization. But students of investment and management should understand the nuances of the subject." On this subject, writing in 1983 Buffett makes a veiled reference to the incorrectness of the Graham and Dodd treatment of goodwill (Cunningham 2002, p.197-8):

My own thinking has changed drastically from 35 years ago when I was taught to favor tangible assets and to shun businesses whose value depended largely upon economic Goodwill. This bias caused me to make many important business mistakes of omission, although relatively few of commission.

Keynes identified my problem: "The difficulty lies not in the new ideas but in escaping from the old ones". My escape was long delayed, in part because most of what I had been taught by the same teacher had been (and continues to be) so extraordinarily valuable. Ultimately, business experience, direct and vicarious, produced my present strong preference for businesses that possess a large amount of enduring Goodwill and that utilize a minimum of tangible assets.

Unlike accounting goodwill, which is 'excess of cost over equity in the net assets being acquired', economic goodwill is the capitalized value of the excess over market rates of returns on net tangible assets. Both concepts are related to intangible assets, but in different ways.

Economic goodwill provides a connection to the "earnings power value" identified by proponents of 'value investing' (Greenwald et al. 2001, ch.5). To illustrate the concept of economic goodwill, Buffett examines the purchase of See's Candies in 1972, a basically debt free company that Berkshire-Hathaway continues to own up to the present. The purchase price of this company was \$25 million and the net tangible assets of the company was \$8 million.¹² Observing that the after tax earnings of See's was approximately \$2 million per year, it is apparent that the 25% return on assets represented more than just the market return earned on tangible assets. The excess return above what could be earned on the net tangible assets at prevailing market rates of return, capitalized at an appropriate discount rate, is the economic goodwill. See's had intangible assets associated with reputation, consumer loyalty and quality of product. In contrast, accounting goodwill would depend on a combination of factors, i.e., the premium over book value of the price paid for the firm, adjusted for fair value revaluation of inventories and tangible assets, plus amortization of goodwill and adjustments for deferred taxes. The resulting number may, or may not, capture the implicit value of the intangible assets.

Considerable discussion in value investing analysis is dedicated to the sources of 'earnings power value' associated with "assets plus franchise". Businesses where the return on tangible assets is in excess of market rates of return are strong candidates for increased competition. This competition can arise in various forms, e.g., on the price side from competitors already in the market or from the entry of new firms. The end result is irresistible market pressures that force the return on assets to the market rate of return, or possibly below. What factors enable firms to resist these market pressures? Identifying **sustainable sources of competitive advantage** is the subject of numerous books and theories. A number of such sources of competitive advantage include: **licenses**, such as television or telecom broadcast rights; **production efficiencies** due to factors such as patents, specialized human capital or economies of scale; **access to cheaper sources of either capital, labor or other inputs**; and, **the franchise factor** associated with customer loyalty or acquired tastes.¹³ It is not surprising that arguably the most important franchise factor business, Coca-Cola, is also a major holding of Berkshire-Hathaway.

Another key difference between accounting and economic values identified by Buffett involves the treatment of **depreciation**. This is directly related to the concept of "owner earnings" (Cunningham 2002, p.211):

"owner's earnings" ... represent (a) reported earnings plus (b) depreciation, depletion, amortization, and certain other non-cash charges ... less (c) the average annual amount of capitalized expenditures for property plant and equipment, etc. that the business requires to fully maintain its long-term competitive position and its unit volume.

Except in special cases, (c) will be difficult to estimate and, as a result, can only be a guess. However, for Buffett: "the owner earnings figure, not the [deceptively precise] GAAP figure [is] the relevant item for valuation purposes -- both for investors in buying stock and for managers in buying entire businesses." Buffett cautions that the use of measures such as EBITDA to determine 'cash flow' will likely lead to "faulty decisions". Economic depreciation is not the same as amortization and this is another essential feature required to take into account in arriving at an estimate of intrinsic value.

3.2 Modern Finance and New Finance

A. Conquering the Old Finance

Merton (1987, p.150) describes "old finance" as "an essentially loose connection of beliefs based on accounting practices, rules of thumb and anecdotes". In contrast, modern financial economics featured "rigorous mathematical theories and carefully documented empirical studies". The battle for the academic high ground in Finance between institutionalists – representing the old Finance approach – and the neoclassicals – representing modern Finance – was particularly vicious, even by academic standards. The opposition, it seems, was completely flattened and forgotten. Any helpful ideas were rolled into the scientific movement express train that was modern Finance, e.g., Poitras (2007). As it played out, the wide gap between the *ex ante* claims advanced by the modern Finance movement and the actual *ex post* performance of the theories in the market place brings to mind another observation of Stigler (1965, p.15): "we commonly exaggerate the merits of originality in economics ... we are unjust in conferring immortality upon the authors of absurd theories while we forget the fine, if not particularly original, work of others".

While recognizing that the benefits of diversification had been identified long before, Markowitz (1999) emphasizes the contributions of Markowitz (1952, 1959):

What was lacking prior to 1952 was an adequate *theory* of investment that covered the effects of diversification where risks are correlated, distinguished between efficient and inefficient portfolios, and analyzed risk-return trade-offs on the portfolio as a whole.

Markowitz (1999) recounts that his motivation to develop a formal optimization model of the risk-return tradeoff for a portfolio of securities was inspired by a rejection of Williams (1938) where the rule guiding investment decisions was to "maximize the discounted ... (expected) value of future returns". For Williams, the value of a stock was the discounted expected value of future dividend payments. The resulting investment strategy called for selection of securities with the highest expected return. For Markowitz, the Williams approach to investment decisions ignored benefits of diversification. Though Williams (1938) did deal with the impact of uncertainty, the approach

suggested was to assign probabilities to possible future states and evaluate the expected value of the investment. Williams felt that diversification would result in an elimination of security risk premia, a view that does not deal adequately with security covariances.

Markowitz (1999) reviews many contributions dealing with aspects of diversification, the risk-return tradeoff and the like appearing in the two decades before Markowitz (1952, 1959). The general assessment of prior contributions is that the discussion did not provide much beyond general terms and “did not clearly indicate why it is desirable”. As demonstrated by Rubinstein (2006), Dimand (2007) and others, this ignores the contributions of precursors such as Bruno di Finetti and Irving Fisher. To see this, consider the contribution by Fisher (1930) that receives no mention. In a discussion of “Taking Risk from Speculation” (p.204-7) Fisher clearly deals with the issue of diversification:

A little reasoning permits of a startling corollary. It is this: If we can, by sufficient diversification in investments, get a greater certainty and thus run less risks from our speculation, then the more unsafe the investments are, taken individually, the safer they are taken collectively, to say nothing of profitableness, provided that the diversification is sufficiently increased.

This paradox is derived directly from exploiting the old-fashioned fear of common stocks and the consequent refusal to deal in them, except well below their “mathematical value”.

What follows is a delightful discussion of the fair game model that is used to motivate the notion of the “caution coefficient” – Fisher’s term for the cost of risk, a concept developed in Fisher (1906).

Fisher measures the cost of risk as the difference between the expected value (“mathematical value”) and the price that will be paid for the gamble: “a sound minded investor will pay less than the mathematical value for a chance to gain money on a risk. That is, he will trim the price by means of a ‘caution coefficient’” (p.205). It is clear that Fisher was advocating the use of mean-variance expected utility functions to model investor choice:

The “caution coefficient” becomes, in practice, greater and greater as the risk grows. If my chance of getting a dollar is a certainty, there would be no reduction on account of the caution factor. If it is like the chance of betting on “heads” or “tails”, the caution factor may trim the price of the chance down from fifty cents, in mathematical value, to say, forty cents for the chance to win the dollar. That is a reduction on account of caution to 20 per cent. But if one bets on two heads in succession, the reduction on account of caution would be correspondingly greater, so that instead of paying twenty-five cents, the mathematical value, the investor might insist on a reduction of more than 20 per cent to say, fifteen cents. It is both normal and proper that the higher the risk the cheaper the chance of winning can be obtained, compared to its mathematical value.

What remains is for Fisher to translate this risk-return tradeoff into a portfolio context.

A key result of modern portfolio theory is that the market does not reward the total variability of a security’s return, only that part which cannot be eliminated in an efficiently diversified portfolio. Whether Fisher grasped this point is unclear from the key part of the discussion:

Hence, the more risky the investment would be to a lone individual playing the game, the safer it is, if, by pooling in an investment trust with wide diversification in investment, the individual risk is thereby absorbed. For as the (individual) risk grows it can be constantly absorbed by corresponding increases in diversification. Thus the individual investor of the trust may gain more on the riskier investments, bought by the trusts at much less than their mathematical value, than if he played the market alone with less risky investments, but bought at much nearer their mathematical value.

Fisher goes on to observe that the aggregate risk reducing benefits associated with increasing use of “investment trusts, investment counsels and other skilled means of diversifying” contributed to the overall rise in stock prices during the 1920's.

Fisher (1930, ch.13) contains a number of other intellectual gems. For example, Fisher (p.206) seems to anticipate what Markowitz was to do over two decades later: “This principle (of higher expected return for the same level of risk through diversification), so far as I know, never has been definitively formulated in the investment market”. Fisher directly ties the benefits of diversification to the “principle of constant inspection”. Portfolios have to be actively monitored – “rebalanced” in modern terminology -- in order to achieve the anticipated portfolio expected return. Bond portfolios require less monitoring than stock portfolios. Fisher explicitly identifies the value of “scientific appraisals of the stock market” to increasing the value of stocks in general and spoke favorably about the benefits of what has come to be called “fundamental analysis”. Fisher recognizes the differences between the various entities using the moniker ‘investment trusts’ — some of which were “avowedly of the most speculative type ... because they may heavily concentrate their holdings”. Finally, Fisher explicitly recognized the diversification benefits of holding foreign securities.

From Markowitz to Fama

A number of candidates are available for selection as the intellectual beginning of modern Finance. Numerous sources identify Markowitz (1952, 1959) as the starting point, e.g., Brealey (1991), Rubinstein (2002), Markowitz (1999). In contrast, Rubinstein (2003) suggests an earlier beginning, tracing the roots back to Fisher (1906, 1907, 1930a) and Williams (1938). Rubinstein (2006) identifies the important role of di Finetti. Recognizing that the Markowitz approach was not widely recognized until after the contributions by W. Sharpe (Sharpe 1963, 1964), the contributions of Modigliani and Miller (Modigliani and Miller 1958; Miller and Modigliani 1961) (MM1;MM2) are arguably an appropriate starting point. This position is supported by a close reading of the literature at the time. For example, in launching a “hostile review” of MM1 (Bernstein 1992, p.175), Durand (1959) represented a broad consensus of academic opinion at the time that MM1 appeared. Durand (1960) demonstrates that, at the time, the Markowitz model had not received the close scrutiny that was given to MM1. Initial criticisms of the evolving modern Finance approach included individuals that, at first glance, would seem to be disposed to MM1, MM2 and the Markowitz approach, e.g., Durand (1957).

As Rubinstein (2003) recognizes, the attribution of ideas to specific individuals is a difficult task, particularly where the individuals involved are no longer living. As such, the task of identifying the

origins of modern Finance has been simplified significantly by Bernstein (1992) which provides a wonderful collection of first hand insights into the individuals involved at the beginnings of modern Finance in the 1950's and early 1960's. While it is tempting to push back to time line to individuals writing prior to this period, such as L. Bachelier, J.B. Williams and I. Fisher, there is too much of a temporal gap separating these contributors from the widespread recognition of the “bombshell assertions” (Bernstein 1992, ch.9) that modern Finance adherents used to supplant the Old Finance from the core curriculum of business schools. In this interpretation, the modern Finance revolution begins with Modigliani and Miller (1958), gathers steam during the 1960's and reaches fruition by the middle of the 1970's. Though Markowitz (1952) appears at an earlier date, it is Markowitz (1959) that more appropriately fits into the time line suggested here.

The selection of MM1 for the beginning date of the modern Finance revolution is not intended to imply that MM1 was the most theoretically significant of the early contributions. Bernstein (1992, p.41) reflects the generally accepted view among modern Finance adherents about the relative significance of Markowitz's contribution:

The most famous insight in the history of modern finance and investment appeared in a short paper titled: “Portfolio Selection”. It was published in the March 1952 issue of the *Journal of Finance*, the only journal then in existence for scholars in the field. Its author was an unknown 25-year old graduate student from the University of Chicago named Harry Markowitz.

Having said this, Bernstein proceeds to recognize a time line that supports the primacy of MM1:

No one, including Markowitz, was aware that his paper would turn out to be a landmark in the history of ideas. Although his achievements would earn him a Nobel Prize in economic sciences 38 years later, the paper languished for nearly ten years after publication attracting fewer than twenty citations in the academic literature until after 1960. By that time, Markowitz had written his dissertation on the subject and had converted it into a full-length book.

In contrast to the slow acceptance of the Markowitz theory of portfolio optimization, MM1 gained almost instant notoriety.

Markowitz (1952, 1959), ultimately, became the theoretical foundation for the “modern portfolio theory” that is at the center of the modern Finance approach. In contrast, MM1 and MM2 did not make such a wide reaching contribution. This is, at least partly, due to the nature of the results being presented. MM1 demonstrated that, in perfect capital markets, the capital structure of the firm will be irrelevant to the market value of the firm, i.e., there is no optimal capital structure. Similarly, MM2 demonstrated, again in perfect capital markets, that the dividend policy of the firm was also irrelevant to the market value of the firm. In the case of the firm's capital structure, MM1 proposes that the market value of the firm ($=$ market value of debt + market value of equity) is determined by the assets side of the balance sheet. The liabilities plus equity side of the balance sheet only determines the division of the asset cash flows between security claimholders. It is not possible to change the market value of the cash flows from the assets by reorganizing the division of those cash flows between claimholders.

In addition to the basic demonstration that the value of the firm is determined by the assets side

of the balance sheet, the MM1 argument also had to deal with investor preferences for a specific type of capital structure. Given the random behavior of asset cash flows, firms with more debt on the balance sheet will have a higher variability in the payments made to equity claims. While this would seem to indicate that the common stock in firms with higher debt levels is riskier and, as a consequence, will have a different market value than the common stock of an otherwise identical firm with a lower debt level, MM1 demonstrates that by engaging in borrowing or lending activities in conjunction with purchases of the common stock, individual investors are able to create a 'synthetic capital structure' for the firm that is consistent with the desired portfolio cash flow variability associated with holdings of the firm's securities. Because the individual investor is able to synthetically achieve a desired capital structure through portfolio allocation, the market value of the firm's debt and equity claims will not be priced to reflect differences in firm capital structure.

MM2 follows lines similar to MM1. The dividend policy of the firm is irrelevant because individuals are able to create a synthetic dividend that is consistent with the individual's desired dividend payout. From the firm's perspective, dividend payments made to shareholders represent foregone retained earnings. In cases where retained earnings are insufficient to sustain the capital requirements needed to fund the firm's growth, the dividend payments are recouped through new share issues. Where the dividend policy is lower than dictated by the firm's capital requirements, then the excess retained earnings will be used to repurchase the firm's common stock. Within this context, if the individual finds the firm's dividend policy is lower than desired, then a fraction of the share holdings can be sold each period to obtain the desired level of 'synthetic dividend' cash flow. Similarly, if the dividend payout is higher than desired, the surplus can be used to purchase shares. While, over time, the number of shares outstanding will differ between otherwise identical firms with different dividend policies, the market value of the equity claims will be the same. As in MM1, this occurs because the value of the firm is determined by the assets side of the balance sheet.

Though MM1 and MM2 did not go on to play a central role in the theoretical development of modern portfolio theory -- the core of modern Finance -- MM1 and MM2 did play a central role in the attack on the Old Finance. Dividend policy and the capital structure of the firm are key concerns in traditional security analysis. The theoretical claim that such concerns are irrelevant is potentially devastating. More importantly, the irrelevance results were made by exploiting the analytical properties of perfect capital markets. The rational, maximizing individual operating in a 'frictionless' market environment -- a central feature of the economic positivism that characterizes modern Finance -- represented a metaphor that was to prove irresistible compared to the institutionally and legally driven model of the Old Finance. However, the topics that concerned MM1 and MM2 were focused largely on the central issues of Old Finance and did not play a crucial role in the evolution of the core theory of modern Finance.

What early contributions did play a key role in the evolution of the core theory of modern Finance? The general consensus among modern Finance academics, e.g., Rubinstein (2002), is that at the head of the list are the seminal contributions that led to the capital asset pricing model (CAPM) and the market model: Markowitz (1952, 1959) and Sharpe (1963, 1964). In addition, as recognized in Markowitz (1999), Tobin (1958) can also be given some credit for containing the essence of the two fund separation result, albeit within the context of modeling the demand for money in a portfolio optimization framework. Markowitz (1999, p.10) observes: "At a meeting with Tobin in attendance, I once referred to his 1958 article as the first capital asset pricing model". Apparently Tobin did not

accept this interpretation. In any event, while making an important contribution to monetary economics, Tobin (1958) did not have a similar impact on Finance. It was Sharpe (1963, 1964) that recognized the key revolutionary result: “the expected return on each security is linearly related to its beta and only its beta”.

The core theory of modern Finance is not limited to the Markowitz mean-variance optimization framework and the CAPM. Running roughly in parallel with the development of these concepts was the work on the random character of stock market prices that culminated in Cootner (1965) and Fama (1965). While interesting in itself, this work also laid the foundation for the efficient markets hypothesis (EMH), and the modeling of stock prices (returns) as conditional expectations with information sets characterized as weak form, semi-strong form and strong form.¹⁴ This progression was aided considerably by Fama et al. (1969) which introduced a novel statistical methodology, based on cumulative abnormal residuals, that could be used to empirically test the semi-strong (and strong) form of the EMH. In turn, development of the EMH strengthened the argument for using the CAPM and Markowitz model. More precisely, under the EMH, it was not possible to use available information to earn systematic, risk-adjusted abnormal returns. This substantively undermined the basis for doing ‘Old Finance’ security analysis, strengthening the rationale for the elimination of diversifiable risk through portfolio optimization methods.

While circa 1965 modern Finance was still in the process of evolving into a coherent package, Fama (1970) illustrates that by the end of the decade modern Finance had developed into something resembling a coherent whole. With the appearance of Fama (1976) (*Foundations of Finance*), the revolution against the Old Finance was largely completed, the corpus of modern Finance was solidified and the program of future research was well defined. In addition, by the mid-1970's, attention of the modern Finance school was shifting to extending and exploring the seminal contribution of Black and Scholes (1973). Though a connection can be made between the CAPM and the Black-Scholes formula, it is difficult to meld the notion of pricing by arbitrage with that of pricing by expectation. Though there were substantive efforts to exploit the continuous time pricing technology used in Black and Scholes (1973) to the CAPM framework, e.g., Merton (1969, 1973a), a disconnect between these two streams of modern Finance survives to the present day.

Modern Finance has adopted the rational, maximizing individual as the central abstraction upon which theoretical knowledge about security pricing can be obtained. Inductive methods – especially variants of regression analysis – are used to determine whether a particular version of a theoretical model is consistent with observed data. If the null hypothesis is not empirically supported, the model is restructured, typically by altering an assumption, and retested. While sharing this general epistemological approach, there have been three distinct tracks in modern Finance: the *CAPM* and Markowitz mean-variance portfolio optimization model; the *EMH*; and, the *contingent claims pricing models* that emerged following Black and Scholes (1973). Though there has been some complementarity between each of these tracks, each evolved somewhat differently and, as a consequence, modern Finance cannot be viewed as coherent doctrine of interlocking parts. Questioning of one part – such as the EMH being questioned by the ‘New Finance’ – does not necessarily involve questioning another part – such as contingent claims pricing models.

The lack of initial coherence between the inductive EMH and the theoretical CAPM created a number of confusions that, at the time, puzzled those seeking to understand the emerging school of thought. Some of these confusions still survive to puzzle those being introduced to the dictates of modern Finance. This is illustrated by the use of the term “efficient frontier” to define a central

concept in the Markowitz approach. The ‘efficiency’ in this case is only loosely connected to the informational ‘efficiency’ that concerns the EMH or the Pareto ‘efficiency’ that arises in microeconomic theory. Similarly, the different tracks in modern Finance each lead to somewhat different implications for security analysis and investment strategy. For example, while the CAPM leads to two fund separation as the appropriate investment strategy, contingent claims pricing technology suggests that dynamic portfolio insurance is an appropriate strategy. In the end, what binds the strands of modern Finance together is the underpinnings provided by the positivist approach.

B. Two Fund Separation and Exchange Traded Funds

Strategic Asset Allocation

Asset allocation involves determining the asset mix for a specific portfolio. Following Statman (2001) and Poitras (2005, ch.10), the asset allocation decision is a precursor to the security selection decision. Strategic asset allocation is a key first step that professional investment advisors take in the process of establishing new account parameters for unsophisticated investors, e.g., Bodie (1997). The new client is asked a range of questions regarding income level, risk tolerance, age, expected retirement age and the like. The types of questions asked are much the same across investment advisory firms. The end result is typically some target percentages for equity and fixed income holdings that will likely be slowly changed as the individual investor ages and the contribution levels to the portfolio change. This process is guided by the intuition that bonds are ‘safe’ and equities are ‘risky’. Investors approaching retirement with low levels of risk tolerance are directed to portfolios that are heavily weighted to fixed income while those investors that are younger and have a higher level of risk tolerance are funneled into portfolios heavily weighted to equities. Despite the practical importance of such asset allocation strategies, Elton and Gruber (2000, p.27) observe: “almost no attention has been paid [by academics] to examining advice regarding the asset allocation decision”.

Canner et al. (1997) and Campbell and Viceria (2002) initiated a discussion about the inconsistency between central propositions of modern Finance, such as the capital asset pricing model and the two fund separation theorem, and the strategic asset allocation advice conventionally provided by professional investment advisors. In particular, the *two fund separation* theorem requires that the asset composition of the risky tangency portfolio – the market portfolio – is the same for all investors. Differences in risk tolerance across investors are handled by altering the value weights allocated to the riskless asset and the risky tangency portfolio. Hence, the ratio of stocks to bonds will not change across investors. This is inconsistent with the conventional strategic asset allocation advice of professional investment advisors. However, as Elton and Gruber (2000) illustrate, a range of qualifications are required to accommodate the various possible specifications of “modern portfolio theory” which includes the two fund separation theorem as a special case. Included in these qualifications are: the presence of a riskless asset; whether short sales are permitted; and the number and type of risky assets permitted in the risky portfolio.

The two fund separation result goes by a number of related names, such as the ‘portfolio separation theorem’, ‘two mutual fund theorem’ and the like, e.g., Ingersoll (1987, ch.6), Elton and Gruber (1995).¹⁵ The essence of the two fund separation result is that ***all investors will hold combinations of only two portfolios, the market portfolio and the riskless security***. In practice, this can be

achieved by using a combination of broad based, value weighted market index ETF combined with a money market fund or long term government bond ETF. In the purest form, the investment strategy decision associated with two fund separation is solely a strategic asset allocation decision: how is the total amount of invested capital divided between the riskless asset and the market portfolio. Because two fund separation is predicated on the assumption of market efficiency, it is not feasible to engage in tactical asset allocation where the proportions invested in the two funds varies according to market timing decisions. The investment strategy decision is based on the risk attitudes of the investor. While the composition of the market portfolio is fixed externally, the proportion of the portfolio held in the riskless asset can be either positive (lending) or negative (borrowing). If the proportion is negative then the investor has borrowed at the riskless rate and has a leveraged position in the market portfolio.

The theoretical conditions required for two fund separation to apply are quite restrictive. If all other assumptions of the model are maintained, the basic two fund separation result is not affected by whether short sales are allowed. Given the assumed homogeneity of investors, the tangency portfolio is the market portfolio because all assets have to be held in equilibrium. Short sales of the riskless asset are used to move the investor along the capital market line. Dropping the assumption that there is a riskless asset requires a zero beta portfolio to be determined as a substitute for the riskless asset. This will require a short sales assumption for the risky assets. Using the zero beta portfolio in place of the riskless asset, a version of the two fund separation theorem still holds with the additional implication that “all portfolios on the efficient frontier are a linear combination of any two other efficient portfolios” (Elton and Gruber 2000, p.28). It follows that “any recommended portfolio must be a linear combination of any two other recommended portfolios”. This provides an additional restriction on the properties of portfolios recommended by professional investment advisors.

Dropping both the riskless asset assumption and the short-sales-allowed assumption is sufficient to undermine the two fund separation theorem. Elton and Gruber (2000, p.28-9) provide a summary of the implications arising from dropping these assumptions:

If short sales [and the riskless asset] are not allowed, the nature of the efficient frontier changes. The two-fund theorem no longer holds. Securities enter and leave the efficient frontier at different risk-return tradeoffs. The points where they enter or leave are called corner portfolios. Securities may be held in zero weight for a range of risk tolerance and some assets are never held. Generally, the maximum return portfolio on the efficient frontier will consist of one asset and the minimum risk portfolio will consist of multiple assets. Thus, if short sales are not allowed and advisors are rational, any allocation recommendation should not be a linear combination of any two others unless all three lie at or between adjacent corner portfolios.

It follows that the practical implications of modern portfolio theory depend on the assumptions made to generate the results of interest. Depending on the assumptions made and the empirical return data used to determine the associated portfolio allocations, a range of possible specifications have to be considered in determining whether specific professional investment advice is consistent with the prescriptions of modern portfolio theory.

The central impetus for Canner et al. (1997) was to develop tests of rationality consistent with modern portfolio theory that could be applied in assessing the validity of strategic asset allocation

advice of professional investment advisors and financial planners. Though Canner et al. argue for the irrationality of a decrease in the ratio of bonds to stocks as investors risk tolerance increases, Elton and Gruber (2000, p.40) demonstrate: “whether or not short sales are allowed, the sign of the relationship between the bond stock ratio and risk hypothesized in Canner et al. cannot be used as a rationality test”. In general, it seems that simple theoretical tests derived from modern portfolio theory are problematic and empirical properties of bond and stock returns have to be considered. Yet, once empirical properties are introduced this raises the problem of using *ex post* parameter estimates to determine the *ex ante* values required to make the strategic asset allocation decision. Ultimately, an underlying feature of this discussion is the implicit assumption that modern portfolio theory is the appropriate measure of rationality. Even if the epistemological approach of modern Finance is accepted, the various possible specifications of the model admit a range of sometimes conflicting strategic asset allocation prescriptions.

What is Tactical Asset Allocation?

Tactical asset allocation is a catchall expression that is aimed at capturing gains to **market timing and portfolio rebalancing** decisions. Tactical asset allocation strategies can take a variety of forms, e.g., Arnott (1998). A common format is reflected in Ragsdale and Rao (1994, p.209):

In tactical asset allocation, the central question is: Which asset class will provide superior future returns? Because relative returns are more important than absolute returns in this particular setting, many tactical asset allocators have focused on expected return premiums or spreads. As a practical matter, the most important comparison is that between stocks and fixed income (either bonds or cash) and the forecast on which the most effort is expended is the expected return for stocks. The comparison between stocks and fixed income is crucial because these are the two largest pools of assets in institutional portfolios. Stock return forecasts are important because, historically, stocks have provided the highest and most volatile investment returns.

ETF's that track specific stock indexes are well designed for this approach to tactical asset allocation. Though a number of methods can be used to determine tactical asset allocation decisions, the basic procedure involves starting from a **benchmark** asset mix derived from the strategic asset allocation decision and then employing tactical methods to systematically deviate from the benchmark mix. Precisely how much deviation from the benchmark is permitted depends on the specifics of the fund being managed. Using the studies in Lederman and Klein (1994) as a guide, it appears that tactical strategies based on mean-variance optimization techniques are an important component of the class of available strategies.

As portrayed in modern Finance, tactical asset allocation takes place prior to a security selection decision. As such, the composition of risky assets is usually associated with a stock fund, such as the S&P 500, and a bond fund. Following Fox (1999), this leaves two key elements in the tactical asset allocation decision: “the tilt” and **forecasting ability**. The **tilt** is concerned with the amount of deviation from the benchmark holdings of the risky assets. If the benchmark is, say, 60/40 stocks and bonds then a “full tilt size” could be 20% deviation, i.e., maximum values of 80/20 and 40/60. Fox uses this full tilt value in combination with a forecasting ability variable to simulate a range of tactical asset outcomes. Fox (1999, p.46) describes some results of the simulation relationship: “In

the long run, managers with forecasting ability of 60% or better will virtually never underperform the benchmark. For managers who have superior forecasting skill, increasing tilt size improves the entire range of possible return outcomes.” As with other tactical asset allocation studies, performance is measured relative to the benchmark portfolio. In a study of the *tracking error* that arises in tactical asset allocation, Ammann and Zimmermann (2001, p.32) demonstrate that the higher returns to forecasting ability are not at the expense of benchmark tracking accuracy: “imposing fairly large tactical asset allocation ranges produces surprisingly small tracking errors”.

Another element in the tactical asset allocation exercise is the *rebalancing frequency*.¹⁶ Fox (1999), for example, uses monthly rebalancing as do Ammann and Zimmermann (2001). Presumably, this fixed rebalancing interval is a restriction imposed by the requirements of the research design, rather than being reflective of actual fund manager practices. However, Fox (1999, p.40) observes: “the relatively small size of the US [tactical asset allocation] universe. Other types of portfolio managers can be compared to fifty to eighty peers, each with a long investment history. [Tactical asset allocation] managers have many fewer counterparts and only a handful have long-enough observed histories for accurate assessment”. It would appear that the relevance of the tactical and strategic asset allocation approach is due more to the connection to modern Finance than to the practical importance of the approach in the fund management industry. As such, there is little guidance from practicing fund managers as to the appropriate rebalancing interval. Perhaps a daily or weekly tilt would apply for some funds while a quarterly or annual tilt would apply for other funds? Perhaps an irregular rebalancing interval is most appropriate but, if so, the process for determining a rebalancing point needs to be adequately specified.

Though there are decided similarities with other approaches to investment strategy, the terminology ‘tactical asset allocation’ is intimately tied to strategic asset allocation and, in turn, to the modern Finance approach to investment strategy. As for similarities with other approaches, tactical asset allocation strategies can be contrasted with, say, the Dow theory where: the tilt is *usually a “bang-bang” solution*, i.e., 100% stocks during bull markets shifting to 100% fixed income during bear markets; the forecast is generated by interpreting the Dow theory signals; and the rebalancing period is determined by the movements of the market rather than by a fixed time interval such as monthly or quarterly. Within the conventional tactical asset allocation framework, industry rotation and country rotation strategies are considered to be too close to the realm of security analysis. There are some practical reasons for this. For example, certain institutional investors, such as pension funds and life insurance companies, have restrictions on holdings of foreign assets. A similar comment applies to the allowable tilt, where there are also various restrictions on the tilt imposed on institutional investors.

The connection between security analysis and tactical asset allocation is explored in various sources, e.g., Poitras (2005, ch.10); Brinson et al. (1991); Blake et al. (1999); Kritzman and Page (2002). When security analysis is eventually added to the process, there are a number of potential feedbacks into the tactical asset allocation decision that have to be considered. For example, the tracking error associated with deviations from the benchmark portfolio could become substantial if the actual risky assets are small collections of individual securities (or even individual securities), as opposed to broadly diversified passive index portfolios. Another potential feedback concerns the re-balancing frequency. Using, say, a monthly re-balancing interval would require that securities be purchased and sold on specific days while security analysis typically requires that transactions be determined by value calculations. In effect, the tilt is determined by the number and variety of

securities that satisfies the security analysis selection criteria at a given point in time. It is not obvious how to integrate security analysis, which involves decisions about a significant number of individual securities, into the tactical asset allocation framework, where forecasts are made for a passive index.

Despite the connections between tactical asset allocation and modern Finance, there is a lack of agreement among modern Finance adherents about the efficacy of the practice. To purists, tactical asset allocation is another form of market timing strategy. Even when the potential for market timing is recognized, modern Finance purists usually observe that the range of optimal changes in portfolio weights is much less than typically recommended by tactical asset allocators. For example, Samuelson (1990) observes:

If you do have timing ability, flaunt it! But in the absence Napoleonic pretensions to clairvoyance, your rational flauntings are more likely to involve switches of a few percent in your equity fraction around some optimal intermediate level rather than the swings from 100% in stocks to 10% in stocks that characterized many asset allocation systems ...

The basic intuition behind the attack on tactical asset allocation is embedded in the terminology used by Samuelson (1990) to describe the practice: “across-time deviations from diversification”. Market timing requires the investor to temporarily deviate from the allocations that provide optimal, long-term diversification. Hence, unless there are sufficient gains in expected returns, tactical asset allocation will produce a sub-optimal amount of diversification resulting in a lower measured performance using, say, the Sharpe ratio. While this conclusion is strongest for iid returns and log utility, the basic result carries through to other situations.

Performance Measurement and Cash Management

Portfolio performance measurement is a central concern of modern Finance. Yet, as demonstrated in Campbell et al. (1997), Daniel et al. (1997) and Cochrane (2001), adequate treatment of this topic can take the discussion decidedly in the direction of sophisticated financial econometrics. Even when such techniques are employed, there is still considerable scope for manipulation of performance measures (Goetzmann et al. 2007). To illustrate the issues involved, consider the application of performance measurement to the specific topic of cash management. Included in the useful studies on the topic of performance measurement are Brown et al. (1992), Elton et al. (1996), Elton (1999), and Carpenter and Lynch (1999) which consider the problem of *survivorship bias* in studies of fund (or common stock) performance. This bias can arise in empirical studies of mutual fund performance because poorly performing funds disappear and are typically deleted from the sample because the price history does not cover the full sample (and other reasons). The result is that the samples used for fund performance studies may be biased toward over-representation of the better performing funds. Other recent studies of portfolio performance measurement include Pastor and Stambaugh (2002), Carhart (1997) and Ferson and Schadt (1996).

Despite being an integral part of investment strategy, little attention is given to the cash management element of the decision. For example, in the CAPM, which provides a theoretical basis for two fund separation, the cash management decision is modeled as a problem in riskless lending and borrowing. Yet, unless the investment horizon of the portfolio is exactly equal to the term to

maturity of the default-free, zero coupon fixed income security used as the riskless asset, then there will be a reinvestment risk associated with rolling the security over at maturity.¹⁷ In addition to confusions associated with specifying the riskless asset, there are also complications associated with the cash flow requirements of the portfolio over the investment horizon. The basic optimization model underlying the CAPM and two fund separation assumes that there is a fixed level of initial wealth that is invested at the beginning of the investment period. Depending on the specification of the optimization problem there may be rebalancing along the time path. In addition, in the consumption-investment form of the problem, allowance could be made for cash inflows or outflows along the time path, in the form of consumption and investment expenditures that can take positive or negative values. In a practical context, this leads to consideration of trading strategies concerned with buying along the time path, such as dollar cost averaging, e.g., Leggio and Lien (2003).

Adherents of modern Finance have long recognized the *practical limitations of the riskless asset* concept, e.g., Roll (1978). This concept of ‘cash’ as a riskless security that pays the riskless rate of interest differs from actual ‘cash’ which is legal tender – Federal Reserve bank notes in the US – that do not pay interest. Even this type of cash is subject to the erosion of purchasing power associated with price level inflation. Ignoring inflation, it is possible to view cash as a ‘riskless’ security but this requires the riskless rate of interest to be set equal to zero. Perhaps an interest bearing chequeable bank account is a more appropriate security to use as cash? What about using a money market mutual fund? Both of these securities feature changing interest rates, violating the CAPM condition that the security is riskless unless the frequency of interest rate changes equals the portfolio rebalancing frequency. In models with a fixed rebalancing frequency of, say, 3 months, then it is possible to use a 3 month US Treasury bill as the riskless asset. In any event, the issue of defining cash is a significant complication in assessing the appropriate cash management strategy to pursue. However, because the resolution of this complication diverts attention from more germane issues, it will be assumed that, somehow, an appropriate cash asset has been identified.¹⁸

It is conventional in the modern Finance approach to investment strategy to unbundle the cash management decision from the investment management decision. There are a number of reasons given for this simplification. For example, the previous discussion illustrated the point that the cash management decision requires ‘cash’ to be defined. Even when an acceptable definition for the cash asset(s) is given, the cash requirements for the portfolio decision are usually given exogenously. Over time, there may be cash inflows to the portfolio from net labor income or cash outflows due to drawdowns during retirement. However, such cash flows do not typically impact the optimal solution to the theoretical investment decision problem in a transparent fashion. Interpretation usually involves making sense of intertemporal marginal rates of substitution, correlations between labor income and investment returns, rates of time preference and the like. To avoid such complications, it is conventional to simplify the cash inflow/cash outflow component of the portfolio decision by assuming that a lump sum of initial wealth is invested at the beginning of the investment horizon and is held until the end of the horizon. This framework can be adjusted to permit the initial lump sum to be invested over a sequence of time periods, as in dollar-cost-averaging strategies.

Unbundling the cash management decision from the larger investment optimization problem permits a number of possible approaches to be pursued. Unfortunately, this unbundling does not necessarily lead to useful and practical recommendations. Following the theoretical approach used in economics, *the optimal cash management solution* will depend on the individual investor’s supply and demand for cash. The supply of cash will depend on the initial capital and, possibly,

other factors such as the cash flow requirements, investment returns and labor income over the time path. The demand for cash will have three basic elements: precautionary demand; transactions demand; and speculative demand. Unfortunately, using this approach opens a hornet's nest of conflicting opinions about: the specification of the different demand functions; the various definitions of money, from "high powered money" to "near-money" to "outside money"; the empirical properties of the possible demand function specifications and so on. Following Tobin (1958), the speculative demand for money can be modeled using much the same theoretical framework as that employed in the derivation of the Sharpe-Lintner CAPM. This approach reduces the solution of the cash management decision problem to that contained in the CAPM.

In the CAPM framework, optimal holding of the riskless asset (cash) depends on a combination of investor risk attitudes and the spread between the riskfree rate and the expected return on the risky portfolio. When appropriate, this optimal holding is adjusted at each of the potentially diverse number of rebalancings that occur over the investment horizon. In practice, this process reduces to deciding the optimal method of purchasing risky assets over the rebalancing period (investment horizon). Cash assets are held as a buffer to support such purchases. A number of possible methods are available. **Lump sum investing** involves purchasing the desired asset allocation at the beginning of the rebalancing period (investment horizon). The disadvantage of this approach is that the purchase decision may occur at a time when the risky assets are selling at 'high' prices, somehow defined. In addition, the change in asset prices over time will cause the portfolio weights to deviate from the desired asset allocation. If no rebalancing is permitted along the path, or if the optimal lump sum allocation is 100% in risky assets, then the lump sum approach reduces to the **buy-and-hold** approach. In such cases, the tactical and strategic asset allocation decisions are identical.

At least since Merton (1973) it has been recognized that the buy-and-hold approach is generally sub-optimal. A widely recommended alternative approach to buy-and-hold is **dollar cost averaging** (DCA) where the investor makes a fixed dollar investment at regular intervals during the rebalancing period. The underlying rationale for DCA is that the risk of buying at a market high associated with lump sum investing is avoided. In addition, for risky assets with volatile prices, the larger number of shares purchased at low prices will more than offset the smaller number of shares purchased at high prices, resulting in a net gain. An alternative to DCA is **value averaging** where, instead of investing a fixed dollar amount each period, the size of the investment is set to maintain a constant increase in the value of the portfolio each rebalancing period. For example, assume the objective is to increase the portfolio value \$100 per month (the rebalancing window). If the portfolio increases 5% in the first month, then investment in the second month would be \$95 ($+ \$105 = \200). If there is a 2% drop in the second month then the investment in the third month would be \$104 ($+ 196 = \300) and so on. Both value averaging and DCA are aimed at capturing the gains of 'buy low, sell high'.

In comparing these different approaches, it is useful to identify the various types of investment situations being compared. The conventional structure is associated with an inheritance. The investor acquires a sum of money at the beginning of the investment horizon and has to determine the strategy for achieving the highest level of expected utility at the end of the investment horizon, allowing for possible rebalancing within the horizon. This basic structure would also apply to, say, a retired investor trying to determine the optimal method for withdrawing funds from an investment account to use for consumption expenses, e.g., Vora and McGinnis (2000). In this case the relevant question being determined can be described as: is it optimal for the retired investor to make one large

withdrawal at the beginning and hold cash over the horizon or is it optimal to make regular withdrawals? To address these types of questions, Leggio and Lien (2003) set the rebalancing frequency at one month and the investment horizon at one year. Distributional information, such as average returns and standard deviation of returns, are then calculated over the sample of annual returns. This general approach tends to mask other possible aspects of the typical investment decision. For example, by working with the arithmetic average of returns, the growth in the value of the portfolio over time is not directly incorporated.

In addition to the structure of the underlying investment decision, to determine the optimal investment purchasing strategy some method of performance measurement is required. It has long been recognized that any claim about the optimality of this or that investment strategy also involves an implicit claim about *the method of performance measurement*. In turn, because optimality is usually situated within an expected utility framework, it follows that performance measurement be similarly situated. As such, it is conventional to take both the risk and return of the strategy into account, except in situations where the objective function imposes risk neutrality. The various limitations and failings of the CAPM have made the subject of performance measurement an active research area within modern Finance, e.g., Ferson and Schadt (1996). Included in the various issues that have arisen are: the method of measuring risk, e.g., beta vs. standard deviation; the structure of the investment problem, e.g., are cash inflows and outflows permitted; the method of measuring return, e.g., geometric return vs. arithmetic average vs. CAPM alpha; and, the types of portfolios being compared.

Perhaps the most widely used method of performance measurement in modern Finance is the *Sharpe ratio* (SR):

$$SR_p = \frac{E[R_p] - r}{\sigma_p}$$

where $E[R_p]$ and σ_p are the expected return and standard deviation of portfolio return and r is the riskfree interest rate. Being the empirical representation of the capital market line, the Sharpe ratio is directly related to the CAPM. This measure is closely related to a number of other performance measures that are also based on the CAPM such as: Treynor's measure, which adjusts the SR by substituting the beta of the portfolio for σ_p ; and, Jensen's alpha, which uses the alpha estimate from the market model expressed in excess return form. Because these measures are all based on the CAPM, it is possible to develop precise theoretical relationships between these measures. Significantly, the reliance on the CAPM to measure performance raises some questions about these estimators.

In addition to portfolio performance measures associated directly with the CAPM, a number of other measures have been proposed. The primary insight of the CAPM measures is that both the risk and the return of the portfolio have to be considered in assessing performance, not just return alone. Though it is possible to consider higher moments of the distribution, this is not conventional. The focus on risk and return leads to consideration of the various methods of estimating the relevant parameters. For example, the $E[R]$ could be estimated using the arithmetic or geometric averages.¹⁹ Sortino et al. (1999) provide an illustration of a performance measure that does not employ standard estimators. More precisely, the *upside potential ratio* (UPR) is calculated by taking the ratio of the Sortino downside risk measure (δ) (Sortino and Price 1994) to an upside expected return measure (θ):

$$\delta^2 = \int_{-\infty}^r (r - x)^2 f[x] dx \quad \theta = \int_r^{\infty} (x - r) f[x] dx$$

where r is the riskfree interest rate, x represents the random variable for security return and $f[x]$ is the return distribution.

INSERT Table 3.3.z Annualized Excess Returns and Risk Measures

As an illustration involving some of these performance measures, consider the Leggio and Lien (2003) empirical comparison of dollar cost averaging, value averaging and lump sum investing (see Table 3.3.z). This study uses the monthly returns from the Ibbotson and Associates Yearbook from four different asset classes: large cap stocks, with returns calculated using the S&P composite index, small cap stocks, which is measured with the Ibbotson small cap index, with US corporate bonds and US government bonds measured using total return indexes for long-term maturities. The riskfree interest rate is US Treasury bills. The study uses the Sharpe ratio, *the Sortino ratio* ($\{E[R] - r\} / \delta$) and the upside potential ratio (θ / δ) to compare the strategies. In doing the calculations, the strategies are assumed to have an investment horizon of one year. It is assumed that a fixed amount of capital is received at the beginning of each period. Dollar cost averaging would then involve investing 1/12 of the capital in the risky asset each month while lump sum investing would invest all the capital in the risky asset at the beginning of the period. The $E[R]$ is then estimated as the arithmetic average of the annual returns over the sample, with other parameter estimates following appropriately. In calculating the results in Table 3.3.z, a 1970-99 sample is used. Leggio and Lien also report results for other samples, such as 1950-1999 and 1926-1999, with some differences in results.

Table 3.3.z is useful for comparing the trading strategies, as well as the properties of the performance measures. Leggio and Lien (2003, p.219) describe the results:

For the sample period of 1970-99 ... the Sharpe ratio and Sortino ratio lead to identical rankings of investing strategies for all asset classes. For corporate bonds, the Upside Potential ratio also ranks the investing strategies consistently with the other ratios. However, for both large-cap stocks and government bonds, Upside Potential ratio ranks the preferred investing strategy as reported by the Sharpe ratio to be the least preferred strategy.

As for the different trading strategies, the relative rankings reveal that, using the Sharpe and Sortino ratios, lump sum did best for large stocks, while value average did the best for small stocks – a case where DCA did significantly worse than the other two strategies. For corporate and government bonds, DCA had the best performance. Value averaging was disastrous for the two bond cases. Using the upside potential ratio to measure performance produced generally contrary results, e.g., value averaging had the best performance for government bonds. Such results raise substantive questions about the different possible methods used to measure portfolio performance. In addition, claims about the superior performance of DCA often made by practitioners are also brought into question.

Milevsky and Posner (2003) seek a theoretical resolution to the popularity of DCA among practitioners and individual investors. Working within a continuous time framework using Brownian bridges, Milevsky and Posner model DCA as a path dependent claim and develop a

mathematical proposition that ‘proves’: “the expected return from ... the DCA strategy — conditional on knowing the final value of the security will uniformly exceed the return from the underlying security for all sufficiently large volatilities.” In effect, DCA outperforms lump-sum investing. This leads to the conclusion that rational investors using DCA are working with target prices. This makes sense in the context of value investing, where adherents of DCA would be working with expectations based on calculated intrinsic values. In this framework, the more volatile is the underlying security price, “the greater is the benefit to dollar-cost averaging — conditional on knowing the final value”. This result is in sharp contrast to what has been generally accepted wisdom about DCA, based on Constantinides (1979) and later theoretical studies where DCA is shown to be a dynamically inefficient trading strategy, e.g., van Duffel (2009).

C. From Modern Finance to New Finance

While the *‘trente demoiselles de Geneve’* investment scheme is of historical interest, it is not possible to date the beginnings of modern Finance from this date. Not only is this date far removed from the institutional context of modern financial markets, the subject of modern Finance is much more than a collection of notions such as ‘the gains to portfolio diversification’. The various notions are connected by a philosophical approach – economic positivism – that unifies these notions to create a coherent and persuasive school of thought. The relevance of this school is clarified by considering the process by which modern Finance was able to supplant during the 1950's and 1960's the "Old Finance" school epitomized by ‘Graham and Dodd approach’ that emphasized individual equity security valuation and selection. By shifting focus onto the portfolio diversification problem, modern Finance argued for the elimination of the firm specific risk that was the stock in trade of the Old Finance adherents. In this process, a new philosophy of equity valuation and selection emerged.

As discussed elsewhere, e.g., Poitras (2005, sec.1.3), a range of philosophical issues need to be addressed in order to develop insight into the prevailing approaches to equity security valuation and selection. It was argued that modern Finance has an inherent philosophical bias that is reflected in both the rhetoric and the prescriptions of academics and, to a lesser extent, practitioners. This bias has resulted in a methodological approach to the subject that seeks to emulate the natural sciences. Yet, being concerned with variables that are the outcome of human interaction, Finance is inherently a human science. While the inductive methods of the natural sciences are necessary to the progress of knowledge in Finance, these techniques are insufficient in the human sciences. Knowledge about phenomena in the human sciences is not rigidly cumulative. Events are historical and, as such, require interpretation in the context of the times. The process of interpretation and prediction is complicated by having to deal with the ‘uncertainty’ of future events. Unlike the natural sciences, it is possible for writers of the past, working with less data and knowledge, to have insightful understandings of a specific phenomenon that compare favorably with the views of contemporary writers.

This chapter has been concerned with developing the intellectual history of security analysis. This also required some selected discussion of financial history. The time line incorporates Graham and Dodd (1934), a text that is heavily influenced by the historical events which preceded its publication. Yet, the text stands as an example of how writers from a previous era, working with less data and ‘knowledge’, produce results that have a timeless quality. To be sure, Graham and Dodd (1934) has

to be read in the context of the time the book was written as do other such books from that period, e.g., J.M. Keynes (1936). Given this, Graham and Dodd (1934) acts like a beacon that can be used to determine where modern Finance is now situated on the equity valuation landscape. As a consequence of recognizing the biases in modern Finance, even basic results such as "stock returns will outperform bond returns in the long run" can be given a more useful interpretation in terms of predicting what type of valuation method to employ for identifying particular securities to purchase or sell.

Haugen (1999a,b) provides a refreshing description of the academic evolution from the "Old Finance" of Graham and Dodd to the world of "Modern Finance" (modern Finance) associated with modern portfolio theory, the CAPM and the EMH. Haugen proposes that the evidence against modern Finance, in terms of anomalies and the poor predictive ability of the models, is so strong that a "New Finance" is emerging to replace modern Finance. For Haugen (1999b, p.8), the New Finance represents the complete supremacy of the inductive method:

And now Modern Finance begins to teeter.

And a New Finance appears.

Discard those theories that obviously have *no* predictive power. Discard the requirement that all explanations must be based on rational economic behavior. Look carefully at the data and measure accurately without preconception. Discard the tradition that you must model *first* without looking and *then* verify. Carefully measure behavior first, and then find *reasonable* and *plausible* explanations for what you see. Ascension of the *ad hoc*, expected return, factor model. The measure of any model's relative merit: the *unmined, out-of-sample, relative accuracy of its predictions*.

For those unable to see whether this is sincerity or sarcasm, the next sentence is telling: "Go back to teaching students a *craft* rather than a *religion*". For Haugen, the New Finance achieves complete supremacy for the inductive methods of the natural sciences.

Putting aside some enthusiastic views concerning the emergence of the New Finance, Haugen (1999b, p.3-8) does give a useful analysis concerning the progression of Finance from the time of Graham and Dodd (1934) to the present. Haugen obtained his education in Finance in the early 1960's, "when Modern Finance was relatively young and when the Old Finance was dying". Accounting and law were the basic foundations of the Old Finance and the professors of the time were experts in those fields. The theme of the Old Finance was the analysis of financial statements and the nature of financial claims. Classic texts were Graham, Dodd and Tatham (1951) and Dewing (1953). "Graham and Dodd spent most of their book showing us the painful process of adjusting accounting statements so that earnings and assets of different companies could be directly compared ... In (Dewing), we learned the legal rights of financial claims – *in great detail*. We learned the laws relating to merger and acquisition as well as those governing bankruptcy and reorganization."

Haugen describes Graham and Dodd as "very *dry* stuff and not too interesting". Dewing, on the other hand, made Graham and Dodd "look like a Stephen King thriller". Haugen views the professors of the Old Finance as teachers of a craft. "As possible future financial executives, we needed to know the rules of the game if we had to merge or go bust, as well as the legal impediments on our firm's behavior created by the financial claims that were there today or might be there tomorrow". The time of Haugen's graduate finance education, the early 1960's was "an interesting

time indeed" as modern Finance was breaking onto the academic scene, doing battle with and, eventually vanquishing the Old Finance. Though the birth of modern Finance can be traced to the portfolio optimization model of Markowitz (1952, 1959), the model was largely unnoticed until the emergence during the late 1950's and early 1960's of the other pillars of modern Finance: the Modigliani-Miller irrelevance theorems; the capital asset pricing model; and the efficient markets hypothesis. In contrast to the accounting and law foundations of the Old Finance, modern Finance was a product of financial economics. The central theme was that securities could be valued using models assuming rational economic behavior.

The emergence of modern Finance represented a direct attack on the teachings of the Old Finance. Haugen (1999b, p.6) observes: "The craft of finance and the teachings of my old professors had been rendered *obsolete*. *It's not nice to be obsolete*. The professors of the Old Finance fought very hard to retain their relevance. The battles of this intellectual war are still recorded in the pages of the old issues of the Journal of Finance and the American Economic Review. But the professors of the Old (Finance) lost most of these battles, and eventually they lost the war itself." The winning of the rhetorical intellectual battle brought a wave of new professors into Finance programs, trained in graduate programs that emphasized theorizing using the assumption of rational economic behavior. The position of the proponents of modern Finance was buttressed by the emergence of option pricing theory: "Modern Finance took off. It became the dominant discipline in business schools, and it carried great influence in the real world." Having gained a position of intellectual superiority, proponents of modern Finance actively promoted the paradigm.

The intellectual history of modern Finance from the mid-1960's until the present makes for an interesting case study in the process by which knowledge is created in an academic environment. The developments are similar to those in economics where the assumption that economic agents are rational also became the central theme of economic theory, e.g., Kindleberger (1989, p.29); Mirowski (1989); Weintraub (2002). Even though rationality is only an assumption that may or may not be an accurate description of the world, Haugen, Kindleberger and others observe that the validity of the assumption was "intellectually enforced" by the younger network of academics. This enforcement process took place in the journals and in the classrooms. Given the substantial investment of human capital that had been made by the younger network in the techniques and knowledge associated with the rational maximizing models, such enforcement activities are not surprising. However, as Haugen puts it (1999b, p.7), "even when the mud is thick, truth always makes its way to the surface".

Haugen provides an interesting description of the enforcement process:

Those who would dare to question the validity of the (Modern Finance) paradigm – especially that of efficient markets – were summarily dismissed as *gauche*.

Those who dared to publish papers contradicting the paradigms were ridiculed. Their studies were supposedly replete with bias. And their methods, of course, were naive.

Their studies included only firms that survived the study period – survival bias. They used earnings numbers that may not have been publicly available at the time they bought the stocks – look-ahead bias. They spun the computer countless times until they got an interesting result – data mining. They didn't take transactions costs into account. They didn't risk adjust their returns. They didn't test for statistical significance. Their results weren't robust in different time periods.

On and on ...

Haugen is quick to point out that early studies critical of the paradigms of modern Finance did turn out to be on the mark: "But (were) summarily *dismissed*, in any case". Haugen traces the emergence of the New Finance to the accumulation of theoretical and empirical results that challenged the main propositions of modern Finance, e.g., Kahneman and Tversky (1979); Lopes (1987); Tversky and Kahneman (1992); Statman (1995); Levy and Levy (2002). New Finance is based on the theme of psychological explanations for inefficient markets.²⁰ Though the connection between psychology and economics goes back at least to Katona (1951), the main empirical paradigm has been associated with inductive ad hoc factor models. The operative techniques are inductive methods from statistics and econometrics. There is a substantial overlap, if not a formal equivalence between Haugen's New Finance and behavioral Finance, e.g., Shefrin (2000); Akerlof and Shiller (2009).

While Haugen's description of the progress of modern Finance is helpful, the notion that there is a "New Finance" emerging is suspect. It seems to be predicated on a misunderstanding of the economic positivism that underpins academic modern Finance albeit with less emphasis on the formal logic of model development or, more precisely, with emphasis on model development related to prospect theory, e.g., Tversky and Kahneman (1992). Ultimately, the New Finance is just an evolutionary, more inductive branch of the scientific movement associated with modern Finance. Even an individual as jaded as Haugen about the lack of vernacular appeal of modern Finance still clings to the belief that the inductive process will lead to an accumulation of knowledge that progressively uncovers the true nature of the subject. There are physical laws of nature governing financial activities. Given enough data, these laws can be identified and used to make valid enough predictions about optimal portfolios or security prices to be of significance in the vernacular world of Finance.

Modern Finance approaches equity valuation within the context of models that assume rational economic behavior. A strong belief in market efficiency provides a basis for arguing that traditional security analysis, along the lines of Graham and Dodd, will not be able to consistently earn abnormal returns. Given this belief about the analysis of individual securities, rationality dictates that investment strategy focus on the identification of optimally diversified portfolios. Assuming that the capital asset pricing model is an accurate description of security market equilibrium, it follows that the rational individual investor will hold portfolios that are composed of two managed funds; the riskless asset, which can be traded using either a money market fund or a long term government bond fund; and, a broadly based, value weighted equity index ETF to capture the market portfolio. The weights in which these two assets are held depends on the risk attitudes of the investor. For example, investors with a high level of risk tolerance would borrow at the riskless rate (negative weight on the riskless asset) and leverage up in the market portfolio (positive weight greater than one). Those with low levels of risk tolerance would hold both the riskless asset and the market portfolio (both weights positive and less than one).

Economic positivism strives to achieve a scientific approach, divorced from normative values, emphasizing quantification, measurement and empirical verification of hypotheses. As such, modern Finance is a combination of theoretical hypotheses and the accumulation of empirical results aimed at testing those hypotheses. Initially, considerable effort was expended in developing models, based on rational maximizing behavior of economic agents. Included among the most important models are the Markowitz portfolio optimization model and the capital asset pricing model. The theoretical

framework employed to model the rational decision making process usually involved agents, subject to a budget constraint, choosing among available securities or capital assets in order to maximize the expected utility of terminal wealth. Because the value of terminal wealth depends on the prices of securities or assets that are not known at the time the optimization decision is being made, the models of modern Finance are particular examples of the more general decision making under uncertainty problem.

NOTES

1. Poitras (2007) quotes P. Bernstein regarding the personal equity security investment practices of T.B. Macaulay: "During the depression, when his bank loans secured by his personal equities were deeply under water, the banks still carried the loans because they wanted to continue with Sun Life's business."
2. Harold (1934, p.42-3) traces the initial statement that common stocks are acceptable as long term investments to a statement made William Hughes to a convention at the Institute of Actuaries in 1902, quoted in Raynes (1928). Harold observes: "Nothing of importance was done in the matter until 1912 when Professor Fisher and others suggested the theory, at least in part".
3. Christ (1994) and Dimand (2009) discuss the early history of the founding of the Cowles Commission for Research in Economics. The Commission was founded in Colorado Springs in 1932, basically because the investment advisory firm run by Cowles was located in Colorado Springs. The Commission was formed primarily at the initiative of Cowles and Irving Fisher, president of the recently formed Econometric Society. The first edition of Econometrica in 1933 followed shortly after the Commission was founded. In 1939, the Cowles Commission moved from Colorado Springs to the University of Chicago. Jacob Marschak served as director from 1943-1948, when T. Koopmans succeeded to the position. For a combination of reasons, including some opposition to the Cowles Commission within the economics department at the University of Chicago and a desire to attract James Tobin to the directorship, in 1955 the Commission moved to Yale University and was renamed the Cowles Foundation. While a graduate student at the University of Chicago in the 1950's, Harry Markowitz was a member of the Cowles Commission.
4. As evidence of quantitative background, Durand and Greenwood (1957) and Gumbel, Greenwood and Durand (1953) are two substantive contributions to mathematical statistics. Biographical information on Durand is available in a number of sources. The March 6, 1996 edition of *Tech Talk*, the official MIT newspaper, has a lengthy memorial by Enders Robinson, a close friend of Durand. Good coverage of available sources is given in Szekely and Richards (2005). See also Durand (1989) and Durand (1992) for more information on how Durand viewed his various contributions.
5. GDC do not use the words "primary" and "secondary" in the fashion that is conventional in modern Finance where a primary issue is a 'new' issue, such as an IPO for a common stock or a Treasury issue that has just been auctioned, and a 'secondary' issue is a previously issued security,

such as the common stocks traded on the NYSE or Treasury bonds traded in the OTC market. For GDC (p.3) a 'primary' stock issue is a "first line" or "standard" issue of "large and prominent companies, generally with a good record of earnings and of continued dividends." A 'secondary' issue refers to the more marginal common stock issues that have not obtained 'primary' quality. GDC estimate that about 80% of listed stocks and 90% or more of unlisted stocks belong in the secondary category.

6. The precise specification of the margin of safety is unclear. Recognizing that there is a target level of 20-30 stocks in a portfolio, presumably the margin of safety will change as the level of the market changes. When the market is 'high' there will be a greater proportion of fairly valued and overvalued stocks and it will be necessary to have a lower margin of safety, say 10-15%, in order for there to be stocks that will qualify for selection as there will be 'overvalued' stocks that were purchased previously that now require selling. Similarly when the market is 'low' there will be a proportionately greater number of 'undervalued' stocks to buy and less 'overvalued' stocks in the portfolio to sell. This will require the margin of safety to be raised to, say, 25-30%, in order for the portfolio rebalancing exercise to make sense.

7. The four dimensions are: (1) superiority in production, marketing, research and financial skill; (2) the people factor; (3) essential characteristics of the business; and, (4) the current value of the stock, measured in a relative *P/E* sense. This leaves Fisher with: *four dimensions*, used to structure the common stock selection strategy in Fisher (1975); *fifteen questions* used to assess business characteristics from Fisher (1980); and, *eight points* in the investment philosophy, given in Fisher (1980) but synthesized from Fisher (1958, 1975). Only six of the eight are listed here.

8. This explicit statement by Fisher contradicts the perception in modern Finance that 'growth' investors bias purchases toward high *P/E* and, presumably, high *P/BV* stocks. Much like 'value' investors, 'growth' investors want to purchase the desired stocks as cheaply as possible. As illustrated, high *P/E* stocks are not desirable for "fresh purchase with new funds".

9. A more expanded version of the thirteen "owner related business principles" plus one added principle underlying Buffett's approach can be found in the Berkshire-Hathaway annual report (2003, p.68-72).

10. For example, in the 2002 Berkshire-Hathaway annual report (p.4), Buffett recommends in reference to management: "to be a winner, work with winners". While this is good advice for Buffett who is able to secure a golf game, weekend retreat or cosy dinner with virtually any major figure in American corporate management, it is little comfort to a small individual investor seeking to make a purchase in, say, US Steel.

11. The reference to holding company is intended in a descriptive and not a legal sense. The description of Berkshire-Hathaway in the 10-K filing refers to an insurance company that owns a range of non-insurance related businesses.

12. Any 'economic value' calculation is subject to interpretation. The calculation of net tangible assets is no exception. A common convention is to use (cash + accounts receivable + inventory +

property, plant and equipment) - (adjustments to reflect differences between the accounting value of the assets recorded on the balance sheet and the replacement cost of the assets).

13. Various descriptions of the value investing approach, in general, and the Buffett approach to value investing, in particular, stress the key role played by the franchise factor as the source of long run corporate advantage and 'monopolistic' profit. However, while the franchise factor is of central importance in the many situations of sustainable competitive advantage, there are other sources that can also produce this result.

14. Though Fama (1970) can be credited with popularizing the weak, semi-strong and strong form terminology, Fama credits the origination of these terms to a colleague at U. of Chicago, Harry Roberts.

15. The 'two fund separation' terminology can be found in various sources. For example, Levy and Samuelson (1992, p.1530) observe: "The Sharpe-Lintner CAPM can be derived by assuming either a quadratic utility function or normally distributed returns. In a multiperiod framework, the quadratic utility assumption also leads to the two-fund Separation Theorem, and hence implies the CAPM."

16. Among others, Levy and Samuelson (1992) provide four sets of sufficient conditions for multiperiod generalization of the single-period Sharpe-Lintner CAPM where investors are permitted to have diverse holding periods and rebalancing frequencies. In the multiperiod context, if portfolio rebalancing is not permitted then the CAPM and two fund separation do not hold, even in the restrictive case of quadratic utility.

17. This assumes that nominal returns are the variable of interest. If, as is common in modern Finance, the real return is the variable of interest, even a default-free, zero coupon fixed income security with maturity date equal to the investment horizon will be risky. Even though the nominal return will be certain, there is still purchasing power risk associated with inflation. This complication can be handled by using an inflation-indexed default-free fixed income security as the riskless asset.

18. An alternative approach to defining cash is provided by the corporate financial statements where there is a 'cash and cash equivalents' item. There is also the "cash flow statement".

19. Strictly speaking, the return in the Sharpe ratio requires that the holding period for the return equals the investment horizon.

20. New Finance is theoretically based on psychological biases arising in prices. The following example of loss aversion is adapted from Kahneman and Tversky (1979). You currently own a stock that you purchased for \$10,000 and has fallen to \$2500. If you hold onto the stock there is a 75% chance the company will go bankrupt and the stock price will fall to zero, and there is a 25% chance the stock will recover to its original value. Based on an intuitive inspection of this decision, should you sell the stock today and lock in a loss of -\$7500 or hold on? What is the expected value of the two transactions? The 'gut instinct' solution to the decision reflects loss aversion?

