
Have Leading Finance Textbooks Incorporated Recent Events?

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In this paper we examine how four of the leading undergraduate, introduction to finance textbooks have incorporated topics that have seen a shift in belief due to recent events and research over the last 20 years. These topics include behavioral finance, market efficiency, the distribution of stock returns and the capital asset pricing model (CAPM). We find that all of the textbooks profiled here rarely, if ever, use the world bubble, fail to discuss non-normal distributions, still talk about the CAPM as if it was empirically viable, and only lightly cover, if at all, behavioral finance. We then suggest some alternatives that faculty can use to supplement these textbooks to provide their students a view of finance that is closer to reality than is suggested by these textbooks.

INTRODUCTION

There is considerable evidence over the past 20 years that many of the key concepts in modern finance—efficient markets, rational investors, and corporations regularly doing the right thing for their shareholders—have not been borne out empirically. For example, there is significant recent evidence that bubbles and crashes shift prices away from their efficient, rational values for substantial periods of time.¹ Indeed, the NASDAQ composite index stood at 5000 in March 2000 and yet a decade later was still thousands of points lower. Similarly, housing prices declined 30 to 40 percent in some areas over the period 2007-2009.

Extensive evidence in behavioral finance supports the existence of investor irrational behavior. Consider the story of Harry Markowitz, the famous financial economist. A number of years ago Markowitz was working at the RAND Corporation and trying to determine how to allocate his retirement account. He knew what he modern portfolio theory, the theory he himself established argued he should do: “I should have computed the historical co-variances of the asset classes and drawn an efficient frontier.” But, he said, “I visualized my grief if the stock market went way up and I wasn’t in it — or if it went way down and I was completely in it. So I split my contributions 50/50 between stocks and bonds.”² As Zweig (2007) notes:

Mr. Markowitz had proved ‘incapable of applying’ his breakthrough theory to his own money. Economists in his day believed powerfully in the concept of ‘economic man’— the theory that people always acted in their own best self-interest. Yet Mr. Markowitz, famous economist though he was, was clearly not an example of economic man.³

Indeed, this response from Markowitz shows that even he, the founder of modern portfolio theory, uses rules based on rule of thumb rather than a rational/scientific approach.

Given the above, and numerous other events that have occurred over the past 20 years, the question this paper examines is, how have introductory finance textbooks incorporated these new realities? To do this we take four of the current best-selling, undergraduate, introduction to finance textbooks, i.e. Ross, Westerfeld and Jordan’s *Fundamentals of Corporate Finance*, Brigham and Houston’s *Fundamentals of Financial Management*, Block, Hirt and Danielsen’s *Foundations of Financial Management* and Gitman and Zutter’s *Principles of Managerial Finance*, and investigate several areas that have come under repeated questioning in the news and in research.⁴ Specifically, we examine: behavioral finance, efficient markets, the normal distribution of stock returns, and the Capital Asset Pricing Model (CAPM). Textbook content is an important subject to investigate as it is the key source of information for the typical introductory finance student. If current research and events are not incorporated then students receive a view of finance that is outdated. In the next Section we examine how the four textbooks have covered the above topics.⁵ The following section provides suggestions of some alternative approaches that professors should consider using to deal with the lapses in the textbooks. We conclude in the last section.

COVERAGE IN TEXTBOOKS

Behavioral Finance

In 2002 the Nobel Prize in Economics was awarded to Daniel Kahneman for his pioneering work in behavioral economics and finance. Moreover, over the past twenty years there has been an explosion of research into behavioral finance with new journals and conferences specifically geared towards behavioral finance. Despite the rising interest in behavioral finance there is very little coverage of it in the leading introductory undergraduate textbooks. Indeed, in the two of the four books (Ross, Westerfeld and Jordan, 2012; and Block, Hirt and Danielsen 2011) there is no treatment of behavioral finance. In Brigham and Houston (2012), and Gitman and Zutter (2012), there is some treatment of behavioral finance consisting of about one or two pages in each textbook (in Brigham and Houston this amounts to eight paragraphs on pages 6, 49-50; in Gitman and Zutter this amounts to seven paragraphs on pages 39 and 277-278). While these textbooks at least discuss behavioral finance, they do not discuss how it can influence many traditional

theories covered in the book such as cost of capital or the CAPM. Indeed, in the Gitman and Zutter book they state:

While challenges to the efficient market hypothesis, such as those presented by advocates of behavioral finance, are interesting and worthy of study, in this text we generally take the position that markets are efficient. This means that the terms expected return and required return will be used interchangeably because they should be equal in an efficient market. In other words, we will operate under the assumption that a stock's market price at any point in time is the best estimate of value.⁶

In essence, this textbook states that the model may not hold, yet then continues on as if the model holds. As a result, students in their first and possibly only finance course (for non-majors) receive a view of finance that is only shaped by the assumption of efficient markets rather than an approach reflecting not just recent developments in the field but also how financial markets actually operate. This seems to be case in other textbooks surveyed here as they also pay little attention to alternative approaches; the efficient markets approach gets the overwhelming majority of coverage in all these textbooks.

Beyond the limited coverage of behavioral finance, the word “bubble”—which is well used in all media to explain the housing crisis in the U.S. and the European Debt Crisis—is almost never found in these four textbooks. Only in Brigham and Houston, and Block, Hirt and Danielsen, is the word even mentioned (in both books it appears twice: in pages 6 and 49 of Brigham and Houston in pages 6 and 49 and in Block, Hirt and Danielsen. However, in both cases the word appears without an explanation of what bubbles are or how they are created. Although this word may be an anathema to proponents of efficient markets, its absence impairs students' abilities to navigate the many news stories on all media that use the term. Indeed, a student who reads these texts could conclude that a bubble is not really a finance topic at all.

Market Efficiency

Over the last twenty or so years, the topic of market efficiency has become one of the most debated subjects in finance as a significant amount of high quality research has found that markets are not efficient. For example, Shleifer and Vishny (1997), Shleifer (2000), Shiller (2000), and Fox (2009) all show strong empirical and theoretical arguments against market efficiency. Moreover the massive and rapid declines in the price of equities, oil and housing during the 2007-08 financial crisis further illustrate that the market may not be efficient.

Despite this research, the leading undergraduate textbooks generally do not dwell much on the idea that markets may not be efficient. Indeed, the same two textbooks that had no coverage at all of behavioral finance (Ross, Westerfeld and

Jordan, and Block, Hirt and Danielsen) fail to cover the idea of market inefficiency in much detail. In Ross, Westerfeld and Jordan, the authors give two sentences and a graph showing overreaction in prices (page 401). In Block, Hirt and Danielsen they devote only a single sentence: “It would appear that security markets are generally efficient, but far from perfect, in digesting information and adjusting stock prices” (page 459). Hence, while these two texts both describe the theory of market efficiency they do not provide any indication that this theory may not hold empirically.

In Brigham and Houston, and Gitman and Zutter, both sets of authors only briefly mention that markets may not be efficient (pages 48-49 in Brigham and Houston, and pages 39 and 278 in Gitman and Zutter). However, while they mention the issue, they do not describe how market inefficiency could influence the cost of the capital, capital budgeting or the CAPM, concepts that rely on market efficiency holding.

The Normal Distribution of Stock Returns

In all four of the introductory finance textbooks surveyed here, the assumption is made that stock returns are normally distributed. For example in the Ross, Westerfeld and Jordan text the authors state: Figure 12.11 illustrates a normal distribution and its distinctive bell shape. As you can see, this distribution has a much cleaner appearance than the actual return distribution illustrated in Figure 12.10. Even so, like the normal distribution, the actual distributions do appear to be roughly mound-shaped and symmetric. When this is true the normal distribution is often a very good approximation.⁷

In the early 1990’s such treatment of stock returns might have been warranted. However, now we know from much research (see Taleb (2007) or Mandelbrot and Hudson (2008)) that the normal distribution does not in fact hold for stock returns. Instead, stock returns are much better approximated by a distribution with fat tails, as extreme outcomes are much more likely than predicted by a normal distribution. For example, when using daily Standard and Poor’s index returns, the normal distribution suggests that over the period 1916-2003 there should have been 58 days when stocks moved 3.4 percent (positive or negative) or more. Yet over this period there were 1001 such days! Similarly theory predicts only 6 days of index swing more than 4.5 percent (positive or negative) and yet there were 366 such days.⁸

One argument for only using the normal distribution in the text is that it is easier for students to understand as they have likely seen the normal distribution before in statistics classes. Yet simplifying a discussion to the point of misrepresenting the truth cannot be in the best interest of students. Again, the point here is that we have much recent evidence that stock index returns are not normally distributed and yet the textbooks do not even allude to this possibility.

Capital Asset Pricing Model (CAPM)

All four textbooks describe the Capital Asset Pricing Model (CAPM) and then use the ex post empirical results of the model in their analysis of cost of capital, capital budgeting and stock valuation. However, in all the textbooks there is little to no criticism of the empirical application of the model. In Ross, Westerfeld, and Jordan and Block, Hirt and Danielsen, there is no criticism whatsoever. Indeed, a student reading these books alone would have very little idea that this model has questionable empirical support. Gitman and Zutter provide criticism of the CAPM but only on their Internet site (myfinancelab.com); their actual textbook lacks any criticism at all. Only the Brigham and Houston text mentions that this model may not work well empirically, yet does so very briefly in only two paragraphs (section 8.5 (page 286)). Consequently, most of these textbooks have little or no treatment of the fact that CAPM does not work well empirically in the ex-post measurement of risk, nor of John Cochrane's (2010) recent assessment of CAPM:

Our empirical view of the world has changed 100% and more since the early 1970s. In the early 1970s, it seemed that expected returns were constant over time, and the CAPM accounted well for their variation across assets. Now we know that expected return variation over time and across assets is much larger than anyone anticipated. Asset valuations move on discount rate news far more than on news of expected cash flows. *The CAPM explains nearly none of the cross-sectional variation in stock average returns.* Such variation is related to a bewildering variety of new factors instead.⁹

Given the absence of empirical support for the CAPM, why do most of the textbooks surveyed here continue to argue that the model works well empirically? We can understand that the CAPM is useful in helping students understand the tradeoff between risk and return, and as an ex ante model it does provide extremely useful insights for students, but this is no substitute for honest information about the empirical validity of the model. So much research has been conducted over the past 20 years on the CAPM that ignoring its empirical weaknesses is a substantial oversight. Students who rely on these textbooks would have no reason to question the empirical validity of CAPM and its use in calculating the cost of capital, capital budgeting or stock valuation.

ALTERNATIVE APPROACHES

In this section we provide some approaches to deal with the textbook limitations described in the prior Section. Here we try to provide some deeper motivation for why these alternative approaches should be taught to introductory students as opposed to the standard textbook approaches.

Behavioral Finance

Since Adam Smith's *Wealth of Nations*, the assumption in economics and finance has been that humans are generally rational. That is, we are rational decision makers who calculate the value of all the options we face and then follow the best choice of action. Furthermore, if we make a mistake market forces will come down on us and force us back to rationality. We will get punished and we will learn from our mistakes to be rational in the future.¹⁰

However, research in behavioral economics consistently shows that we are not so rational. Indeed, rather than learning from our mistakes we seem to make the same mistakes over and over again.¹¹ This is particularly true in finance where many of the assumptions of rational behavior do not hold consistently. Yet, as explained in the previous sections, students do not get this message from the leading introductory texts in finance.

To try to rectify this lack of coverage of behavioral finance in the textbooks, we present below three topics from behavioral finance that professors could use to illustrate that humans do not always behave as our models predict. These topics can be presented as a supplement to the standard material in textbooks.

Present Bias

In introductory finance, one of the core subjects is the time value of money. Here, among other things, students learn to make decisions based on the present value of a future stream of money. We teach that a rational individual faced with two options will always choose the option with the higher present value.

But this concept does not always hold in reality. Thaler and Shefrin (1981) among others have shown that individuals show a strong bias for the present over the future. Indeed, much of the explanation for why many individuals do not save enough or do not maintain a healthy weight can be tied to the present bias.

What happens with the present bias is that individuals discount the future much more heavily than rational models would suggest. To get students to understand this concept, within the context of the time value of money, tell the following story from the book *Temptation: Finding Self Control in an Age of Excess* by Daniel Akst.¹²

The U.S. military had to cut back on its force (after the cold war ended but before September 11, 2001). The government offered more than 65,000 individuals who were about to be let go a choice between a one-time lump sum and a series of annual payments. The terms depended upon rank, but one typical example was \$22,283 up front or \$3,714 annually for 18 years. There was no risk of default as they were getting paid directly by the U.S. Government.

The present value of the first option was obviously \$22,283. The present value of the annuity (assuming a 5 percent discount rate) was:

$$(3714 * \left[\frac{1}{.05} - \frac{1}{.05(1 + .05)^{18}} \right]) = 43,415.13.$$

Moreover, students should understand that government went out of its way to explain the choices with pamphlets, counseling and media. Also, the lump sum also would have been taxed at a higher rate than the annual payments. Yet, in spite of all the theory suggesting that individuals will rationally choose the option with the higher present value, more than half of the officers and more than 90 percent of the enlisted personnel chose the lump sum!

This example is very useful to students since it clearly shows how many people, some highly educated, are subject to a present bias. It also shows how they can avoid such errors in their own life and the firms at which they work by learning and using the time value of money to maximize wealth.

Overconfidence and Feedback Loops

Again, the assumption in introductory finance textbooks is that most investors are rational. If faced with any problem, investors will be able to see the situation clearly and without prejudice and we should assess the pros and cons objectively.¹³ For example, we should be able to discern if stock prices are too high and force the prices back down to rational reasonable levels.

However, evidence from behavioral research indicates that we often too confident. Instead we are subject to behavioral biases that cause us to make systematic errors in judgment. One of the more important of these biases is overconfidence which is arguably, the main cause of bubbles in asset prices, at least by the investors at the margin that are determining the current security prices.

To better illustrate the concept of overconfidence to students we suggest the following approach. First, convey to students that a large number of studies have found that in anything we regard as a positive trait, e.g., intelligence, attractiveness, driving ability as examples, we tend to think ourselves better than we are. One of the more famous of these is Svenson's (1981) finding that 93% of American drivers rate themselves as better than the median! Then go on to note that this same phenomenon has also been found when individuals try to predict financial markets (see Barber and Odean (2001) or Odean and Gervais (2001) among others).

Next, relate to the students that what is particularly problematic about investor overconfidence in financial markets is that the overconfidence itself creates a feedback loop that leads to bubbles. That is, increases in asset prices create more investor confidence which then, of course, stimulates even higher asset values

which then causes even more investor confidence. In this way, investors become overconfident and this overconfidence then can fuel a rise in asset prices that is not warranted by fundamentals.

To illustrate this concept to students we recommend showing the results of a survey conducted by Shiller (2000, page 47) in which he asked the following question to a group of U.S. investors at three different time periods (1989, 1996, 1999). The results are below:

Question asked of Investors: “If the Dow fell three percent tomorrow, I would guess the day after tomorrow the Dow would:

		1999	1996	1989
1.	Increase	56%	46%	35%
2.	Decrease	19%	24%	34%
3.	Stay the Same	12%	18%	13%
4.	No Opinion	13%	11%	18%

This survey shows that after the massive rise in the market from 1989 to 1999, investors are much more confident in their predictive abilities. Their past successes in the market foster overconfidence in their own abilities. Such overconfidence just adds to the increases in the prices in the market leading to a bubble in stock prices. This same phenomenon is also one of the principal reasons for the bubble in U.S. housing prices from 2002-2006. Indeed, almost any financial bubble, whether tulip bulbs in Holland or dot com stocks in the U.S. in the late 1990s can be traced back to overconfidence among investors.

Another advantage in talking about investor overconfidence is that it allows the professor to address bubbles. What they are, where they come from, what they do to society, etc. Again, the leading textbooks hardly even use the word bubble.

Asymmetric Risk Aversion

The assumption given to student in textbooks is that investors are always risk averse. According to the textbooks, investors may have differing degrees of risk aversion but the assumption that is consistently conveyed in the texts is that investors do not like risk. It is from this concept that risk premia are formed.

However, Kahneman and Tversky (1979) and Kahneman (2011) illustrate that individuals are not always risk averse. Instead, when faced with losses investors often will become risk seeking as the pain of realized losses is so much greater than the benefits produced by gains. In other words, when faced with losses, investors

would rather roll the dice in order to have the possibility of avoiding the losses because they hurt so much. Indeed, Kahneman and Tversky have found that losses hurt about 2.5 times more than gains help.¹⁴ Hence, one needs to make 25 dollars in gains to compensate for the pain of a 10 dollar loss.

Loss aversion is not discussed in introductory textbooks yet it obviously has real consequences for financial behavior. Including this subject will provide an opportunity for the professor to show how people actually behave. Furthermore, students will see their own behavior in this discussion and possibly become more interested in the subject. Lastly, by tearing down the concept that we are always risk averse, students may better understand the concept of risk aversion.

To illustrate the concept of asymmetric risk aversion to students, have them take the simple following test taken from Andrew Lo (2005), p. 24:

Test I) Let's say you are offered two investment opportunities, A and B:

Option A yields a sure profit of \$240,000

Option B is a lottery ticket yielding \$1 million with a 25 percent probability and \$0 with 75 percent probability

Which would you choose?

Test II) Let's say you are offered two investment opportunities, C and D

Option C yields a sure loss of \$750,000

Option D is a lottery ticket yielding \$0 million with a 25 percent probability and a loss of \$1 million with 75 percent probability

Which would you choose?

Most students will choose option A in the Test I and option D in Test II. The reason is that they are loss averse. The pain of a loss is greater than the benefits of similar gain and hence students will be risk adverse when it comes to a gain (picking A in Test I) and risk seeking (picking D in Test II) when it comes to losses.

This discussion provides an excellent lead-in to a discussion of the disposition effect (see Shefrin and Statman(1984)), which refers to investors' predisposition to get back to even in their investments in order to avoid a very painful loss. Hence, if a stock goes down most investors will hold on until it comes back at least to the price at which they purchased the stock in order to avoid the feeling of a loss. This type of behavior governs much of the market, particularly individual investors and highlights yet another opportunity to show students power of behavioral finance.

Market Efficiency

In all four of the textbooks surveyed, the efficient markets hypothesis dominates the discussion. As is well known, according to the theory, prices incorporate all the available information and thus are fairly priced most of the time. The key behind this idea is that investors will observe arbitrage opportunities

and hence will take advantage of these opportunities. By taking advantage of these opportunities, the opportunities are eliminated and the market becomes efficient. Indeed, if everyone believed the market was efficient and consequently did not pursue arbitrage opportunities, the market would likely become inefficient.

As indicated in Sections I and II, much recent evidence indicates that the efficient market hypothesis may not hold for long periods of time. Professors should show this information to students. For example, ask them how market efficiency can explain the massive and rapid declines in the price of equities, oil, and housing during the 2007-08 financial crisis. Alternatively, show them the price-to-earnings ratios of the Standard and Poor's in 1999 relative to other years (see Shiller (2000), p.8), or the wide gyrations in stock prices that occur without a lot of new information (see Shiller (1987)). After this, the professor needs to illustrate why the market seems to be operating not very efficiently. To do this we suggest making the following three points which show that there are significant limitations to investors pursuing the arbitrage that is supposed to keep the market efficient.

The Limits to Arbitrage

Students need to understand that the arbitrageurs who make the market efficient may become constrained in their ability to do the arbitrage. The limitation takes place because the underlying investors and bankers who provide capital to the arbitrageurs may get nervous and pull their money when the arbitrage bets do not pay off quickly. This theory was developed by Shleifer and Vishy (1996)). To help students understand this better have them consider a case similar to that described in Justin Fox's *The Myth of Rational Markets: A History of Risk, Reward, and Delusion on Wall Street* (p. 253-255).

Consider a situation where the market is falling fast (too fast), creating opportunities if one buys in. For example, in early 2009 the price to earnings ratios of the U.S. market were very low by historical standards. If these opportunities are taken, the market stops falling and the prices quickly return to their "correct" position. The problem is that the people who are investing the capital into the funds get nervous as they are losing a lot in the present time as the market continues to fall. Hence, these underlying investors cannot continue to offer capital to continue the bet. As a result, the arbitrageurs have to get out of the market. Thus the very force that is supposed to stabilize the market and bring it back to efficient levels is not allowed to work because the remaining investors in the fund cannot stand the pressure. Consequently stock prices can fall into a downward spiral and go to levels that are not efficient.

Conversely, a professor could have the students consider a case where the market is rising too fast, and thus creating opportunities if one sells short. The problem here is that the people who are investing the capital into the funds get nervous as they are not making a lot of money (when everyone else is) in the

present time. Hence, they cannot continue to offer capital to continue the bet. As a result, these arbitrageurs are forced out of the bet to sell the market short. Again, the very force that is supposed to stabilize the market and make it efficient is driven out of the market because the remaining investors in the fund cannot stand the pressure. Consequently stock prices can rise into a bubble that is not corrected quickly.

This example shows how the lifeblood of efficient markets—arbitrage—sometimes is limited due to how money is, in reality, managed. Since many sophisticated investors manage other people’s money, and because the other people are sometimes short-sighted (due to the present bias), the sophisticated investors cannot make the arbitrage type bets that bring the market back to its efficient level.

Herding

Another subject that professors should relate to students to make them understand why arbitrage does not work properly is herding. Similar to the above example, students should again be made aware that, in reality, most participants in the market are now managing other people’s money. Indeed, in 1965 (when efficient markets theory first was published) only about 15 percent of stocks were held by institutional investors. In 2007, conversely, 68 percent of all stocks were held by institutional investors.¹⁵ One of the direct consequences of this shift is that if an institutional investor makes a mistake, they can be fired quickly by the underlying investors. Because the institutional investor wants to keep their job, they are incentivized to behave in ways that can help move the market away from efficient values.

To illustrate this issue for students, consider a simple example similar to that found in Nate Silver’s book *The Signal and the Noise: Why Most Predictions Fail But Some Don’t*.¹⁶

Let’s say that the market is currently trading at a price-to-earnings ratio that is considered very high historically (as in 1999), and the chances that the market crashes during the next few years are higher than normal. So the trader now has the decision to buy or sell. If they buy they are doing so when markets are already at very high levels historically. If they sell, they may lose out, if the market continues to increase.

Let’s assume the trader does the right thing for themselves:

- a) They buy and then the market goes up.

or

-
- b) They sell and the market immediately goes down after they sold.

In both cases the trader is well off. But in the second case they will probably have been seen as brilliant as very few people can call the time before a market will decline. They may get a significantly better job, but brilliant people are not always in demand especially after a market crash. Hence, they may be right but not benefit from their actions a great deal.

However, now let's assume the trader does the wrong thing for themselves:

- a) They buy and the market crashes right after they buy

or

- b) They sell but the market rises after they sell.

The first case has negative consequences for the trader but since there are many others who have done the same thing, they are probably not singled out. In the second case, the trader is in real trouble. They are probably fired as they have failed while everyone else has not. Their future employment prospects will be dimmed. Their career earning potential will be much lower.

This example shows that for traders it is better to fail conventionally, than to try to succeed unconventionally. Yes, the trader may sell exactly at the right time and be seen as a genius, but the costs of selling at the wrong time are enormous (lose their job and probably can't get another one for a while). Instead, it is better for the trader to be conventional so they will not be singled out. So the truly rational behavior for the manager of other people's money is to ride the bubble and buy in rather than sell the overpriced market and bring it back to its efficient levels. This herding behavior among traders, of course, continues to perpetuate the bubble making the problem worse and causing the market to be inefficiently priced for long periods of time. In short, students will be able to see from this example that the arbitrage-seeking behavior that is supposed to keep the market efficient can be muted by traders' own incentives.

Asymmetric Information

The efficient markets hypothesis assumes that all investors have similar information. Students should be told that this condition often does not hold in

reality. Instead we live in a world where some investors know much less than others and as a result the prices in the marketplace may not reflect the true state of affairs.¹⁷ Consider for example, the banking industry. Since the banks do not readily publish a list of all the loans they have made, nor disclose many of their positions in the derivatives market, the typical bank investor does not know the true condition of the bank. Moreover, the financial instruments of banks and other financial services are so complicated now that it is extremely difficult for the common investor to understand the financial statements of the bank. To put it bluntly, the bank knows much more about itself than the investor does. Consequently, without complete information it is impossible for the common investor to accurately price the bank. The arbitrage that is supposed to keep the market efficient cannot work because many investors are in the dark as to the true state of affairs of the company.

Another example is the high-frequency trading conducted by many well-known banks and hedge funds. Because of their sheer size and location these institutions get information on order flow ahead of what other investors receive and thus have an informational advantage that allows them to beat the market.¹⁸ Or consider the fact that these same funds also spend millions of dollars a year to acquire private information well ahead of its disclosure to the general public. Indeed, there is a multi-million dollar a year industry, called political intelligence, that employs former congressmen and staffers who search for new political information in the halls of congress and then sell this to hedge funds who then use this information to make profitable trades.¹⁹ Because this information is only known by a select few, the prices in the market do not reflect all the available information and hence are not fairly priced. Consequently, the arbitrage that is supposed to keep the market efficient is not allowed to take place fully because some of the participants know more than others.

The Normal Distribution in Stock Returns

If stock prices are governed by efficient markets, then there should be a random walk in stock returns as the only reason for stock prices to change from day to day is the new, random information that takes place the following day. Any other information should already be incorporated into the stock price. If this is the case, then we know from the law of large numbers that the daily stock returns should be normally distributed.

The above is an important point for students to understand as it has major implications for risk management. For example, have them consider the following case presented by John Cassidy in his book *How Markets Fail: The Logic of Economic Calamities* (p.92).

Have the students think about a bank with large holdings of mortgage-backed securities. By looking at how the portfolio has moved up and down during the

last year or two and assuming that movements follow the normal distribution, the bank should be able work out the odds of a big fall in its value over a certain time period (a day, a month, a year). And if the bank can do this, it will be able to take the necessary precautions in the form of capital reserves and financial hedges.

Students will be able to see from this example that if stock returns are normally distributed, risk can be managed scientifically.

The only problem with the above is that stock returns are not normally distributed. Yet as we discussed in the paper's second Section, none of the introductory textbooks make this point. They still all talk about stock returns being normally distributed.

As an alternative to the textbooks, professors should show that the stock returns are not normally distributed by providing the actual historical distribution of stock returns.²⁰ To do this a professor can easily go to Yahoo finance or other Web sites and download the daily Standard and Poor's 500 index returns for the last 40-50 years. Then, calculate the mean and standard deviation of the historical distribution using Excel which then can be used to calculate the probability that a daily shock takes place. The Excel function to do this is NormDist (z, mean, standard deviation). Following this, show that according to the normal distribution the probability of getting a plus or minus 7 percent in any one day is about once every 300,000 years. Indeed, we would almost never see these types of movements in the stock market if it is truly normally distributed. Finally, show the students the actual stock market returns, which indicate that over the 20th Century alone there were 48 times when the actual index moved plus or minus 7 percent on one day!²¹ Such an exercise can help convince students that we do not live in a world where stock returns are normally distributed and that risk is much harder to manage than assumed.

Professors should then relate to students the findings reported in Benoit Mandelbrot and Richard Hudson's book *The Misbehavior of Markets: A Fractal View of Financial Turbulence*. They find that the tails of the distribution of stock returns are much fatter than is indicated by a normal distribution.²² Hence, the chances of extreme outcomes are much greater than that implied by a normal distribution. They also find that stock return data display volatility clustering. That is, we see markets that are characterized by long period of calm when prices do not move much, interspersed with short periods of frantic activity when prices change dramatically. Large changes (positive or negative) tend to be followed by more large changes, positive or negative. Small changes tend to be followed by small changes.²³ Such a discussion is certainly not as parsimonious as the normal distribution but at least it represents reality.

This information on the normal distribution obviously fits well with the previous information on behavioral finance and market inefficiency. Professors

can empirically show with the above discussion that financial markets do not behave with mathematical precision and instead display behavior that is much messier than our textbooks would have students believe. Behavioral finance and inefficient markets play a role in why we see markets misbehaving.

The Capital Asset Pricing Model

Obviously the CAPM is a large part of financial history and should be taught as the ex ante model provides students with an insightful introduction to risk and return. However, the problem is that the introductory textbooks use the ex post empirical results of the model in their analysis of the cost of capital, capital budgeting and stock valuation. The problem with this approach is that there is little empirical validity for the CAPM. Indeed, as we stated in the second paper section, the CAPM explains nearly none of the cross-sectional variation in stock average returns.

As an alternative to the textbook treatment, we recommend that professors show to the students the results of Fama and French (1992) or Malkiel (1996, pages 229-239) which show that empirically, beta does a poor job of explaining actual returns. These results must be shown to students as they deserve to know the empirical efficacy of the model they are studying. Then try to explain why the model breaks down empirically. Specifically explain Roll's (1977) argument that it is very difficult to empirically measure beta with any degree of precision because we do not have a measure of the total market that can incorporate bonds, real estate, commodities, and human capital among other things. As a result we cannot really measure beta as it was intended and thus we see a failure of the CAPM in empirical tests. Then allude to Arbitrage Pricing Theory (APT). Even though the APT is probably a topic that will be discussed in an upper division course, make clear to students that several other systematic risk measures have been identified by Chen, Roll and Ross (1986) such as surprises in inflation, surprises in GNP, surprises in investor confidence (measured by the corporate bond premium) and shifts in the yield curve. Also possibly show that more recent research has found that oil prices and shocks to liquidity are important factors as well (see Huberman and Wang (2008) for good review of the literature on the other factors found for the Arbitrage Pricing Theory). Or discuss the Fama and French (1992) and Carhart (1997) results which show that firm size, P/E and P/B multiples, and momentum are possibly effective proxies for ex post systematic risk. Again, a complete analysis of other options to the CAPM is probably beyond the scope of an introductory class, but some mention of the problems with the empirics of the model needs to be mentioned throughout the teaching of this section of the class. As an ex ante model, the CAPM offers many benefits to students but this needs to be tempered by its severe empirical limitations.

Also note that we provide the additional material that should be added for each of the four textbooks surveyed in an appendix.

CONCLUSIONS

In the preface to the first edition (published in 1991) of their *Fundamentals of Corporate Finance* textbook, Ross, Westerfeld and Jordan state:

In the 1990's, the challenge of financial management promises to be greater than ever. The previous decade brought fundamental change in financial markets and instruments, and the practice of corporate finance continues to evolve rapidly. Often, what was yesterday's state of the art is commonplace today, and it is essential that our finance courses and finance texts do not get left behind. *Fundamentals of Corporate Finance* is our response to what we believe is a real need for a modern, unified treatment of financial management that is suitable for beginning students.²⁴

Although this short paper examines only a few topics, we argue here that the current edition of this textbook (the 10th) as well as the other three textbooks profiled *are* largely behind in explaining the realities of finance. Three of the four textbooks surveyed here never use the word bubble, do not use non-normal distributions, assume that CAPM largely holds, and only lightly cover, if that, behavioral finance. Only in the case of Brigham and Houston is there much coverage on these concepts and even then the coverage is very brief compared with the rest of the book. For example, Brigham and Houston mention the word bubble twice in a 500-plus page book, they cover behavioral finance in about two pages, they make no use of non-normal distributions to explain the distribution of stock returns, and they devote only two paragraphs to the idea that CAPM may not work well.

Why do textbook authors choose to not cover these issues? One reason could be that authors want to keep textbooks simple to facilitate students' understanding; too much questioning of key concepts in the textbook may interfere with a student's understanding. Moreover, concepts like market efficiency and the CAPM are wonderfully elegant and parsimonious and the textbook authors may not want finance to get too messy by introducing doubt in these models. But the flip side of this argument is that we are not conveying to students the realities of finance. Moreover, if we were to teach a finance course that was more open to the new research/realities of finance it would enhance students' learning as the process of questioning the theories presented forces students to think critically about the theory. We want our students to understand the material but often the best way for them to do so is to build up the material and then tear it down.

Another possible reason is that the textbook authors surveyed here were largely educated and practiced finance during a period when market efficiency was the norm. As a result it may be difficult for the authors to incorporate new challenges to their belief system. We know from behavioral research that losses are more painful to people than gains are helpful. We also know that changing

one's beliefs is, in many ways, akin to a loss as it involves admitting that a long-held belief system is wrong. Consequently, changing or challenging a belief system can be very painful for people, making it more difficult for them to change their view or in this case, the textbook.

Yet another reason for the lack of coverage of these topics in the textbooks may be that we want our professors to discuss these issues in class only. That is, we leave these issues out so that professors do not commit the cardinal sin of reading the book to the students in class. However, this comes at a significant cost. Students rely on textbooks to give them a clear view of subject and arguably, students will spend as much time with the textbook, if not more, than they do with the professor. If this is the case, shouldn't our textbooks incorporate this information?

The question we are really raising in this paper is why our field does not have a more balanced approach in introductory textbooks that seriously discusses alternatives to, and problems with standard ideas. We know that famous practitioners like Warren Buffett do not believe in the CAPM and that esteemed finance veterans like Paul Volcker do not believe in efficient markets.²⁵ Hence, why do we often expose introductory students only to the view that these models always work empirically?

Whatever the case, in spite of a large number of events and much research that have challenged the assumptions of traditional finance, four of the leading, undergraduate, introduction to finance textbooks still largely convey a view of finance that is at least 20 years out of date: that financial markets operate in an orderly manner and that these markets behave with mathematical precision. The last 20 years have shown that finance is not so straightforward. Events and recent research have raised real questions about long-held theories and have uncovered serious conflicts of interest that make the profession more of an art than a science. It is in the best interest of the profession to ensure that the material we present to our students incorporates what we have learned and how it matters.

ENDNOTES

¹ See for example see Shiller (2000), p.8, which shows the Standard and Poor's Prices relative to Earnings over the last century. In 2000 the P/E of the Standard and Poor's was near 45 while it averages around 15 for the last century. Another example from Cassidy (2009), p. 238-239 (taken from the Harvard Joint Center for Housing Studies) is that the median house price/median income ratio in 2006 in Los Angeles and San Francisco was near ten when it normally averages at a level of three.

² Zweig (2007), p. 4.

³ Ibid, p. 4.

⁴ The method we determined the four best-selling textbooks was the following. First, according to Amazon.com's list of the 100 best-selling textbooks for fall

2011 Ross, Westerfeld and Jordan is the leading undergraduate finance text with Brigham and Houston second. These are the only introduction to finance, undergraduate textbooks on the list. See the list at <http://www.amazonseller-support-blog.com/2011/12/amazon-marketplace-top-selling-textbooks-for-fall-2011.html>. Second, according to Dyl (2007), Block, Hirt and Danielsen is a best-selling, introductory, undergraduate textbook so we chose to include this book as well. Finally, we choose Gitman and Zutter as it a long-standing text (currently in its 13th edition) and has often been a best seller. Of course, there are other texts but we felt these four would be representative of the finance textbook industry.

⁵ Note that we examine the textbooks to the best of our ability and cite the page numbers where various issues appear in the text. Any errors in this regard are ours alone.

⁶ Gitman and Zutter (2012) p. 278.

⁷ Ross, Westerfeld and Jordan (2012), page 391.

⁸ Cassidy (2009).

⁹ Cochrane (2010), p. 4. Italics added.

¹⁰ Ariely (2008), p.xx.

¹¹ For example the inability for people to adequately save for retirement, to stop smoking, to stop overeating are all examples where people continue to make the same mistake over and over again in spite of evidence that these behaviors are not good for us. For other examples see Ariely (2008).

¹² This example is from Akst (2011, p. 185-186).

¹³ Ariely (2010), p. 5-6.

¹⁴ Kahneman (2011) p. 284.

¹⁵ Greenwood and Scharfstein (2013), p.12. and Silver (2012) p. 353.

¹⁶ See Silver, pp. 353-355.

¹⁷ For a good introduction on asymmetric information in financial markets see Stiglitz (2010).

¹⁸ From the 60 minutes program “Wall Street: The Speed Traders”, October 10, 2010.

¹⁹ From the 60 minutes program, “Congress: Trading Stock on Inside Information”, November 13, 2011.

²⁰ See, for example, Mandelbrot and Hudson (2008).

²¹ This number is calculated by Mandelbrot and Hudson (2008) p. 168.

²² Mandelbrot and Hudson (2008), p.13.

²³ Mandelbrot and Hudson (2004) p. 248.

²⁴ Ross, Westerfeld and Jordan (1991), p. ix.

²⁵ See Morris (2009) for more.

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APPENDIX
Specific Fixes for the Textbooks

Textbook	Behavioral Finance	Market Inefficiency	Non-Normal Distribution of Stock Returns	Empirical Problems with CAPM
Block, Hirt and Danielsen	Although there is a brief mention of behavioral finance, there should be more information given and this information communicated throughout the semester in various sections of the class.	Use our Alternative Approach as there is no Coverage at all the possibility of market inefficiency.	Use our Alternative Approach as there is no Coverage at all of non-normal stock return distributions.	Use our Alternative Approach as there is no Coverage at all of the empirical problems with CAPM.
Brigham and Houston	Although there is a brief mention of behavioral finance, there should be more information given and this information communicated throughout the semester in various sections of the class.	Although there is some mention of the lack of efficiency, there should be more information given and this information communicated in other chapters that rely on market efficiency holding, e.g., the cost of capital.	Use our Alternative Approach as there is no Coverage at all of non-normal stock return distributions.	While there are two paragraphs that address some of the empirical problems with CAPM we suggest a section where professors relate that many famous practitioners do not believe in CAPM and relate possible alternatives.
Gitman and Zutter	Use our Alternative Approach as there is no Coverage at all on behavioral finance.	some mention of the lack of efficiency, there should be more information given and this information communicated in other chapters that rely on market efficiency holding, i.e. capital budgeting, CAPM, and cost of capital.	Use our Alternative Approach as there is no Coverage at all of non-normal stock return distributions.	Use our Alternative Approach as there is no Coverage at all of the empirical problems with CAPM.
Ross, Westerfeld and Jordan	Use our Alternative Approach as there is no Coverage at all of behavioral finance.	Use our Alternative Approach as there is no Coverage at all the possibility of market inefficiency.	Use our Alternative Approach as there is no Coverage at all of non-normal stock return distributions.	Use our Alternative Approach as there is no Coverage at all of the empirical problems with CAPM.