

# *A Theoretical Discussion on Financial Theory: What Should We Teach and How?*

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## ABSTRACT

This essay addresses some of the critical and cohesive teaching philosophies regarding finance theory education in an effort to rekindle and increase our awareness thereof in the wake of rapid advancement and propagation of technology-based practical skills training, which appears to increasingly discount the usefulness of classroom-taught theories. Recognizing the significance of fostering problem-identifying ability in today's financial management, the paper advocates the importance of theory education in finance. Renewed attention to the issue should help reshape finance education for the better in this rapidly changing environment.

## Introduction

As a separate subject of discipline, finance is still in its infancy. It was only the latter half of the twentieth century that witnessed most of major developments in finance with scientific rigor.<sup>1</sup> This means that the whole profession of finance had to digest a very large amount of new theoretical developments in a relatively short time period. Teachers, students, and business people have been continuously introduced to new models, theories, and empirical results thereof over the recent years and the trend continues.

Started out as largely a descriptive, institutional field of study, finance has quickly transformed into a science full of theoretical thrusts. While few would dispute its origin as a branch of applied microeconomics, finance now is as theoretical as its mother discipline.<sup>2</sup> The rapid changes in finance have had a profound implication for business education. Especially, such extensive and rigorous theoretical developments over the recent past have made finance teaching in college classrooms increasingly challenging.

Finance is one of the most quantified and theorized disciplines in business curriculum. The dynamic and complex nature of finance requires continuous development of new theories. As intellectual advances in finance continues in the form of more sophisticated theoretical inquiries, the challenge of teaching finance theories will only grow bigger.

Yet, finance is somewhat unique in terms of the correspondence between theory and evidence. While we educate students to make independent critical evaluations of the contending points of views, many finance theories are still at their developmental stage and so they are highly controversial, debatable, and subject to close scrutiny.<sup>3</sup> This poses as the very first problem to a finance instructor – What particular theories and models should be taught?

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<sup>1</sup> Although some might think otherwise, many seem to agree that the historical demarcation point for today's finance was the work of Markowitz (1952) and Modigliani and Miller (1958). See Miller (1998, p.4), Weston (1981, p.6), and Martin et al. (1988, p.3).

<sup>2</sup> Miller (1998, p.4) described the phenomenal developments in finance by saying, "In the forty years since then, the field has come to surpass many, perhaps even most, of the more traditional fields of economics... in the quality and quantity of combined scholarly output."

<sup>3</sup> The Efficient Market Theory presented by Fama (1970) is a prime example. The theory is critically opposed by, among others, a group of finance scholars known as behavioralists. While largely refuting this criticism, Ball (1994) admits that the theory has obvious limitations. He further notes that with a limited tradition the much of the evidence on stock price behavior cannot reliably address the issue of efficiency. On the other hand, Miller (1998) recognizes the Efficient Market Theory as one of the major works that

Finance textbooks today have a fairly common coverage of theories and models. In addition to such Nobel-winning theories as the Portfolio Theory, the M&M Irrelevance Theorems, the Capital Asset Pricing Model, and the Option Pricing Models, a typical finance textbook carries other theoretical works such as the Efficient Market Theory, the Dividend Discount Model, the Arbitrage Pricing Theory, and the theories about agency costs and information signaling. Nevertheless, individual instructors still have to determine the extent and depth of coverage, the level of difficulty, and the philosophy of addressing the issues.

Over the last several decades there has been an outcry that theory-oriented analytical subjects, such as finance, should make way for more important, newly emerging subjects such as leadership, communication, ethics, global management perspectives, technology, and other soft skills. Besides, the rapid and widespread propagation of educational technology places an increasingly heavy weight on learning and mastering practical capabilities such as spreadsheet skills and thereby disregarding theoretical learning approaches.

In the wake of these developments, finance instructors may well feel embarrassed and even frustrated because finance textbooks are still criss-crossed by theories and models. So, questions arise. Are we overteaching finance theories? Are finance theories of any use and help in today's environment? Should we continue to teach them? If so, how?

Just as these questions sound all too familiar and obvious, so should the answers. The only problem seems to be how often and easily we forget the importance of theory education. So, this essay once again reminds finance teachers of a long-cherished but oft-forgotten educational philosophy – in its essence education is a quest for better theories. As long as we keep finance education within the confines of ivory tower, we should diligently and continuously teach finance theories, and we should do it the right way.

### **Necessity of Financial Theory Education**

It is almost a tautology to start anew a discussion about the necessity of theory instruction. That is because the answer to why we teach and learn theories must be general in that it applies to all areas of study – physics, sociology, engineering, finance, and so forth. Theories are an essential part of education. Winds of change may be sweeping the globe right now. But our belief in this fundamental educational idea may never change.

If we just feed students guidelines to cope with routine problems, we are giving vocational training, not real education. Although they are often used interchangeably, we should not confuse education with training. If we take education as an intellectual process that makes people hear more when they listen, reach deeper when they think, and say more when they speak (McDonald 1988), then education must be different from, and more than, simple repetitive training.

While there is no denying of the necessity of skills training such as how to operate spreadsheets, ready-made software packages, and financial calculators, finance education in college should not stop there. College education ought to produce not those run-of-the-mill type machine operators, but critical thinkers with analytical ability, creative minds, and leadership.

Facing an enormously complex real world, we have to have a device to capture the "essence" of various events, states, phenomena, processes, developments, behaviors, and decision-makings of our interest by abstracting from reality via a theory. A theory is an attempt to give reasons for some observed regularity among things that are complex and often changing. In this vein, we can understand that because of the increasing complexity of the financial environment, finance theory education is mandatory at all levels of instruction (Martin et al. 1988).

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have contributed to the development of the field of finance but which has so far not received the much deserved attention from the Nobel Committee.

As in many other behavioral science fields, explanations and predictions are the main goals in finance.<sup>4</sup> To this end, both theoretical analyses and empirical investigations are necessary. Theories employ abstract deductive reasoning by which conclusions are drawn from sets of assumptions, whereas purely empirical studies are inductive in nature. As theories provide guides for empirical studies and empirical studies provide tests of the assumptions and conclusions of theories, they are complementary (Henderson and Quandt 1958). Nevertheless, it is a theoretical argument that drives us to launch further quest for truth and that is why all areas of science evolve around theories.

No single theory can completely resolve problems. Given the real-world complexities, actual decision-making procedures are often heuristic. Obviously, case study settings can give more accurate descriptions of the real world than any finance theory can. But theories can guide us toward answers. It is theories, not practical rules of thumb based on experiential learning, that help us identify and analyze the right issues in a changing environment.

By adapting theories to the realities of circumstances, we can develop new theories which could shed more light on reasoning process. Theory learning can provide such high-echelon cognitive objectives as "analysis" and "synthesis," which will further develop into accumulation, distillation, and merging ability with respect to similar, divergent, and seemingly unrelated notions. Moreover, as Samuelson (1986) points out, finance as an inexact science benefits enormously from theoretical models that are themselves only partially accurate.

We should let the student clearly understand why we learn finance theories which often accompany formidable equations. They should know that without theories there is only a mass of meaningless observations (Lipsey et al. 1990). Otherwise meaningless observations in our financial world are theorized into equations, graphs, or articulate verbal statements.

By the standards of traditional social sciences, mathematics of some finance theories is indeed intellectually challenging. However, the underlying concepts are often nothing more than common sense or simple intuition. It is therefore important for students to realize that theories are not necessarily quantitative, highly mathematical, or conceptually sophisticated.

Professional education should place sufficient emphasis on the application and practicality of the relevant knowledge. However, practitioners should also be properly educated to transfer new developments from ivory tower to corporate briefing room. It is sad, therefore, to see many academic journals in finance being turned away by corporate America. Part of the reason lies in the unpreparedness on the part of practitioners to receive new theories.

Fortunately many finance theories are widely employed today throughout the business community. Few would deny that the CAPM has significantly changed the world of both finance practitioners as well as academicians. The demand for knowledge of finance theory in day-to-day business is ever growing. Therefore, we should encourage the student to challenge finance theory by all means. We should let them fully appreciate that finance theories continuously give a profound impact on professional behavior in the financial world.

## **What Should Be Taught about Finance Theories**

### *What is this theory about?*

The first thing to be instructed in theory education is where the theory stands. We must make it clear upfront where a particular finance theory fits within the framework of financial decision-making. Students should be informed of what specific question(s) the theory addresses. How should assets be valued? How should investment decisions be made? What is the cost of capital to be used for capital budgeting? How

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<sup>4</sup> The deductive-nomological model by Hempel and Oppenheim (1953), which is based on Aristotle's scientific deduction, started formal treatment of "explanation" as a necessary condition of scientific understanding. While "explanation" and "prediction" are often used synonymously, the latter seems to be favored by the so-called instrumentalists, who argue that theories using unobservable concepts could never be explanatory while they could be useful for "prediction" (see Friedman 1953). Yet, Roll (1988) argues that the paucity of explanatory power (and poor forecasting power) represents a significant challenge to finance.

much debt should the firm employ? Why should price changes be random in an efficient market? What dividend policy is most appropriate?

A caveat is that finance issues are interrelated, sometimes highly intricately. Rarely is one finance issue completely isolated from others. Thus, not only should each issue the theory attempts to address be clearly spelled out, but it also needs to be approached from the integral perspective of financial managers with value-maximizing objective. Although theories are often presented on a 'ceteris-paribus' basis, we should let students be aware how difficult, if not impossible, it is in the real world to hold other things constant.

Most important is that throughout the discussion of a particular theory, we must frequently remind the student of what the relevant issues are and explain what they mean in plain language so that they do not lose sight of the big picture. More often than not, students lose the really critical questions in the midst of mathematical detail. For example, we do not want students to get lost in the maze of statistics when we really want to address the practically meaningful issues of the portfolio theory.

### *Assumptions and Conditions*

Through theory education we must help students develop critical thinking by evaluating important issues conceptually and logically. It is such critical thinking ability that enables students to engage in "process learning," which in turn enables them to adapt to the changes occurring in financial world. An often-raised question is whether we should discuss the assumptions and conditions a theory works under?

It is almost inevitable to utter a word or two about the assumptions of a theory in classroom discussion. Typically we say that all theories are based on a set of assumptions and they may be sometimes very crucial and unrealistic. For example, students are taught that the Dividend Discount Model is based on the assumption that the firm grows at a constant rate indefinitely. At this point, many students become quite concerned about the justification of the assumption. Therefore, while there is a need to explain the assumptions and conditions, we have to do it properly. Otherwise, we only make students more confused.

Simply listing the assumptions is not enough. We should explain what each of these assumptions means, and more important, why each of them is needed for the theory to follow. This turns out to be one of the most fundamental parts in theory education.<sup>5</sup> Relaxing the assumptions often means a new theoretical breakthrough. By raising "what if" questions students learn not only the limitation in the theory's applicability but also the various aspects the theory can improve upon. This is how theory education provides the much-needed adaptability, flexibility, and critical thinking ability.

The ultimate motivation to study any subject is the desire to improve our world. Unfortunately, the world is enormously complex in its every aspect. So, the first step toward our goal is to understand this complexity. But to be able to explain why companies and financial managers behave the way they do, we need a device to capture the essence of their behaviors. This procedure requires abstracting things from reality via a set of assumptions.

So, assumptions are invoked to make complex things simple, not more complex as some students might misbelieve. Assuming a perfect capital market when there is no such thing in the real world may be unrealistic but it is inevitable as we try to get to the core of the matter while disregarding immaterial ramifications.

At this point we may enlighten our students by saying that a finance model, such as the famed CAPM, is functionally no different than a supermodel we see on TV commercials or fashion shows. In both cases a model is presented as a method of depicting reality whose infinite but minor variances are tucked away under the model's long sleeves called assumptions. It is impossible to encompass and comprehend all the divergence in every detail. We thus present a proxy and assume a certain set of circumstances where the statement the proxy makes is true.

Therefore, a model is a model whether it exists as a physical being such as cars, airplanes, houses, appliances, and fashion supermodels or it comes in the form of conceptual designs, descriptive blueprints,

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<sup>5</sup> Mossin (1973) contends that by examining assumptions we can find precisely what is being violated and evaluate the nature and significance of the discrepancy observed in reality.

or financial equations. We should let the student understand clearly that these models do not necessarily give us exact reflection of all the details of reality, such as individual differences, preferences, needs, and goals. Instead, they just try to provide 'blanket representation' that can practically cover the overall reality.

As for the realism of the assumptions, we cannot emphasize too much that it is not appropriate to criticize a theory based on the realism of its assumptions. We must tell the student that the validity of a theory must be judged on empirical tests and remind them that explanatory power and prediction ability is what a theory is all about.

### ***Derivations of Equations and Formulas***

Should we teach students how to derive the final equation of a theory? The answer appears to be a resounding no (except probably for doctoral students pursuing academic careers). Most finance instructors seem to consider the detailed mathematical derivation of a finance theory as not only unnecessary but also harmful to those math-paranoid students. Students who are not well prepared in mathematics tend to dislike finance theories (and the entire finance subject, for that matter) once the professor starts to lead a mathematical discussion.

True, we should not complicate finance education unnecessarily. We should not scare away those math-fearing, otherwise competent, students by presenting the mathematical details of horrendous equations. So, not too many finance professors seem to spend much time talking about stochastic calculus for the Black-Scholes Option Pricing Model.<sup>6</sup>

However, the answer to the above question can also be an affirmative one. An equation of a formula may be memorized, but understanding a theory means understanding the logic and principle underlying the final equation (Ross et al. 2005). Again, if we just teach students how to solve a particular problem with a given formula, we are not doing real education. Providing an opportunity for logical thinking process is an important aspect of theory teaching.

In discussing the capital market theory and the resultant CAPM, for example, it is critical to show the student how one can develop a simple risk-return tradeoff intuition into a formal, precise relationship in equilibrium. Presentation of the calculus-laden CAPM derivation may not be needed, but we do need to explain the logical sequence of the model development, once again in plain language.

Instructors who skip the entire discussion of how the CAPM is derived, mathematically or logically, and jump right into its final equation would miss the important ideas of the model – why the asset's expected return is composed of the two components, what the risk premium means and how it is determined, why the market portfolio is important, and why a particular risk measure is employed. But again, such approach would fail to deliver the most important element of (theory) education – critical thinking process.

### ***Hypotheses, Propositions, Predictions, and Implications***

Presenting a theory's final results is sometimes enough to convey its messages. Conclusions of some theories are simple enough to be considered self-explanatory (e.g., the CAPM), others carry mathematically specified propositions (e.g., the M&M Capital Structure Theorem), yet others posit articulate and spelled-out hypotheses (e.g., the Efficient Market Theory).

However, theory teaching should not end with numbers and notations or some pedantically worded statements. The main messages of a theory should be conveyed to students in plain language. Writing the final formula followed by some number-crunching exercises is not the end. A "so what" question should be raised and answered. Students should be driven to appreciate the significance of the theory's implications in the real world. We should translate those unfriendly equations into layperson's language.

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<sup>6</sup> This brings us another controversial question. What amount of mathematical knowledge should be required for finance education today? Are basic high school algebra and elementary statistics enough or do they need calculus, linear algebra, multivariate statistics, etc.? While a lengthy debate may well follow, let's suffice it to note that the more mathematical training one receives, the better off the person will be regardless of the career choice.

In teaching finance theories, we should emphasize the structure of hypotheses, especially the highly sought-after economic rationale. While in some cases well-confirmed empirical generalizations without an economic rationale are sufficient as testable hypotheses, we typically require reasonableness or plausibility of hypotheses which is the assessment of prior probabilities about the characteristics of hypotheses (Salmon 1963). Such discussion would lay the foundation for better understanding of empirical testing of the theory.

By explaining what the theory implies, we actually subject it to its first validity test. What does Miller and Modigliani's dividend irrelevance theory imply? As it says one particular dividend policy is as desirable as any another, changing dividend policy should not affect the value. A question naturally follows, "Is that true?" Thus, it will lead students to look into the discrepancy between theory and practice, which will raise another important question, "Why?"

### ***Empirical Testing of Theory***

Understanding a theory also suggests that the learner has acquired awareness of how and when it can be applied to achieve some desired goal. Unlike case studies, theories are examples of generalizations disregarding differentiation (Vandell 1988). Since no theories are perfect in the inexact science of finance, we must not only understand the theory itself but also review the empirical evidence which either supports or refutes the hypothesis and predictions of the theory.

Lintner (1975) argues that major contribution to theoretical evolution is fulfilled when students learn how to respond to new conditions or needs which invalidates earlier models. We thus have to address the question, "which theory is applicable in these circumstances and what are its practical limits?" The strengths and weaknesses of a theory should be analyzed via empirical testing. Student's motivation to master a theory is enhanced when evidence is presented to show that the theory has some power to explain real-world phenomena (Fama 1976).

The treatment of financial theory should not ignore the real world problems that gave rise to its development in the first place. In this sense, bridging the gap between theory and practice poses as a constant challenge to finance researchers and instructors.<sup>7</sup> We need to discuss a theory's ability to fit actual data by examining empirical evidence for and against it. Students should be correctly informed that theories are falsified only by discordant facts along with alternative theories (Cook and Campbell 1979), and again, not by unrealistic assumptions.

Students should also be cautioned to take heed of the problems empirical tests accompany. We should tell them as most theories are imperfect so are most empirical tests. Empirical studies are incomplete because of their inherent limitations and arbitrariness in sample data and test periods, estimation bias in input variables, methodological flaws, and so forth. We should elaborate distinctively on the problems of both theoretical and empirical aspects.

### ***Demonstration of Numerical Examples***

If the potential contribution of financial decision theory is largely indirect, as Fama and Miller (1972) argue, it is unclear whether we should spend much time to detailed examples to show how to apply the theory in precise quantitative terms. We do not want students to be mere number crunchers. This means that we should not place too much emphasis on detailed and specific solutions to certain narrowly posed numerical problems.

A pitfall in theory education is that frequently we face the dilemma that we may not be addressing real problems (Andrews 1979). So, finance theory education will not be complete unless we provide students with presentation of theoretical concepts, review of empirical evidence, and application of validated theory

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<sup>7</sup> Throughout the years many notable finance researchers, such as Myers (1984), Miller (1991), and Stulz (2002), have been ardently "preaching" the idea of positively and correctly applying various finance theories in the real world.

(Copeland et al. 2003). Demonstration of theory application using numbers constitutes another integral part of theory education.

We should motivate students to identify mathematics with the world they know (Cissel et al. 1990). We need to put theory into practice and emphasize the practical relevance. In this context problems should be based on actual business data rather than hypothetical numbers. The theory of finance has not yet been, and perhaps never will be, brought to the cookbook stage (Fama and Miller 1972). So, rather than spoon-feeding we must encourage students to provide their own inputs necessary for theory application.

### **Some Instructional Ideas for Finance Theory Teaching**

Having confirmed the critical nature of theory learning in finance education, we now present here some useful and helpful instructional guidelines for finance theory education.

#### ***Scientific Rigor and Simplicity***

We should not settle for less scientific rigor in the pursuit of practicality. And we should also realize that scientific rigor does not necessarily imply high degree of technicality. What should be kept up is the rigor in logical argument which is the driving force of the theory.

Good teaching clarifies rather than confuses. Maintaining simplicity is particularly important in theory instruction. Since many finance theories start with intuitive ideas, once understood they are common sense by themselves (Brealey and Myers 2003). It is, of course, not easy to maintain academic rigor on one hand and simplicity on the other. But as many finance text authors argue that mathematics beyond elementary algebra is not necessary to understand their material, it might be true that finance theory never leaves fundamentals (Myers 1984).

"Is calculus needed? Statistics?" This is debatable. However, what we can and should tell students is why calculus is needed and what functions it does in particular problem-solving processes. A great deal of quantitative methods has been employed in the field of finance. Now we should muster up our wisdom to change quantitative discussion into descriptive one.

#### ***More Essay Questions***

In finance, problem-seeking ability is equally important as problem-solving skills. Often, the question is not to choose one from among the alternatives given, but to come up with viable alternative courses of action and evaluate each of them. In this regard, essay-type questions should be more emphasized than multiple-choice questions or simple numerical questions.

Finance theories should not be taught "down" to students, rather they should be led to think and produce better results. A good way to achieve this is to let students make up their own essay questions and answer them. Instructors can evaluate student performance by looking at the relevance, importance, feasibility, and validity of the self-made questions.

#### ***Examples, Readings, Presentations, and Discussions***

Finance theory education can easily be flat and dimensionless unless it is complemented by concrete examples. Without supplemental discussions, it would be very difficult to give students correct figuration of the theory. Fortunately, we have plenty of resources to complement our theory education. Textbooks, case studies, financial newspapers and magazines, and online resources constantly provide fresh financial data and events upon which theoretical applications can be tested. Students tend to give more credence to what the professor says when they encounter classroom-learned theoretical terms in *Wall Street Journal*, *Business Week*, or on *CNBC*.

A typical finance course may not be considered very interesting. But finance courses can become as palatable, down-to-earth, practical, and colorful as any other business courses if we throw in more Michael

Milkens, Enrons, Daimler-Chryslers, Black Mondays, Keiretsus, and so forth. A careful selection of readable articles from academic and practical journals can also produce insightful classroom discussion.

### ***Integrated Approach***

While we must give our students an integrated view toward business management, we often address problems from a very narrowly confined view. Misunderstanding, misjudgment, and misapplication of business problems arise frequently from such narrow, isolated approach. Although many business professors may not be well trained with respect to interdisciplinary teaching and research, we should try.

Various issues within the realm of finance are becoming more intertwined. Being unable to effectively address such integrated issues is probably the biggest reason for the gap between financial analysis in the classroom and real-world decisions. Integrating the various facets of finance is important as is integrating business functional areas. We should be mindful that despite all this exhortation for sound theory learning, a finance theory may not work satisfactorily in practice because it abstracts from, and sometimes totally ignores, many non-finance factors.

### **Conclusions**

Firmly grounded in principles of microeconomic theory and aided by sophisticated statistical methods and powerful computers drawing on massive data bases, the theory of 'modern finance' has made steady progress toward achieving internal consistency and predictive power (Chew 1986). For example, it is important to recognize that to the extent management views its function as the maximization of stockholder value, all financial decisions are based on some theory of capital market pricing. So, there is no doubt that scientific management will continue to search for the most effective means in financial decision-making.

Still, research and teaching in finance is often scoffed at for its professional irrelevance and pedantic sterility. Besides, classroom teaching in general is already difficult because people commonly learn by doing and in the classroom you can only discuss matters in the abstract which is far from real-world activity. Hands-on experience, on-the-job training, in-house training, or at least case studies are often favored over the expository teaching of finance theories.

Let's make no mistake, though. Dealing mostly with uncertain future, finance is bound to be full of uncertainty. Therefore, students should be forewarned that partial solutions, incomplete conclusions, and even no-answer situations are the rules rather than exceptions in finance. More important, they should be directed to realize the importance of finance theory in this environment. It can and should provide "minds-on" training and experience.

Theory education can give critical thinking. It can even nurture the student's capability to develop original, imaginative, creative, and innovative thinking. In this regard, finance educators can and should help drive out the scientific illiteracy that has been prevailing and plaguing this nation now for too long. It is our responsibility to produce "theory-armed" finance graduates who are issue-finding, analytic, practical, and interactive.

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