Finance Professors’ Use of the Case Method at Harvard and Darden MBA Programs: Ensuring Students’ Technical Knowledge in Finance Courses Using the Case Method

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ABSTRACT

One of the potential obstacles of using cases in finance courses is the task of ensuring that students receive the required technical knowledge of the quantitative material. This qualitative study provides a unique perspective of the specific recommendations and practices of multiple, seasoned finance professors from Harvard Business School and University of Virginia’s Darden Graduate Business School, two top-ranked MBA programs with long-standing commitments to the case method as their primary philosophy of teaching and learning. The information gleaned from the interviews and classroom observations of this study can assist educators in overcoming potential obstacle of students’ lack of technical knowledge.

Introduction

One of the deficiencies expressed by critics of the case method is that students of courses that use the case method of instruction lack deep quantitative ability, technical aptitude, and theoretical knowledge, especially in courses in quantitative areas such as finance. The argument is that students who use the case method of instruction make decisions based on feelings, intuition, or opinions rather than on their knowledge and application of theoretical models and formulas. This research study included interview questions to finance professors and observations of MBA finance courses which illuminated the perspectives and practices related to these criticisms and potential obstacles. The participants of the study were finance professors from Harvard Business School and the University of Virginia’s Darden Graduate School of Business Administration, two top-ranked MBA programs that have used the case method as their primary approach to teaching and learning for many years and have a commitment to instructional excellence. The methodology employed was a qualitative field-based case study which utilized interviews of the finance professors, observations of case discussion courses, and analyses of relevant program documents.

This article addresses the ten factors that Harvard and Darden MBA professors consider vital for ensuring technical knowledge in a finance case method class. These include (a) Readings; (b) Technical Notes and Online Tutorials; (c) Case Questions; (d) Theory Integrated in the Cases; (e) Optional Summer Prerequisite; (f) Lecturette and Interactive Lectures; (g) End-of-Module Notes and Online Practice Problems; (h) Quizzes and Exams; (i) Weekly Tutorial Sessions and Mentoring Programs; and (j) Forcing Quantitative Support, Analysis, and Calculations. Each of these practices and recommendations is discussed by integrating the unique perspective from the insights gleaned during the interviews and observations of the case discussion leaders at Harvard Business School (HBS) and the Darden Graduate School of Business Administration. This article provides specific themes, narrative, and observations regarding the qualities of a successful case discussion leader which can assist educators in developing their abilities and skills to implement when using cases in the classroom.

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Review of the Literature

The factors of student performance in a finance course are documented in several studies. Didia & Hasnat (1998) found that a high cumulative GPA and strong prerequisite knowledge in accounting, economics, and math were positively correlated with a strong performance in Principles of Finance Courses. Paulsen & Gentry (1995) found that deep-level learning strategies were more positively related to performance in a finance course than surface-level learning strategies. These strategies include elaboration-organization (ELOR); metacognition (MC); and time, study, and effort regulation (TSER). Johnson, Joyce, and Sen (2002) found a positive relationship between students’ levels of effort and their performance in the Finance Principles course. Filbeck and Smith (1996, p. 84) determined that students’ learning-style preferences as they relate to the teaching style and course content they receive have a positive effect on their performance in a Corporate Finance course. They surmised from their study that, “finance instructors should encourage students to examine and analyze the overview, patterns, and connections between the material; to approach problems in a creative and innovative way; and to grasp abstractions and complexities.” They believe that students with these skills would rise to higher levels of leadership and have the ability to adapt to a complex, volatile business environment.

There has also been research conducted on the use of cases in the business school classroom. Reynolds (1976) stated that the primary purposes of using cases with students include imparting the ability to recognize a broad range of problems in their field, working with known concepts that are useful to problem-solving, and approaching new situations and then discovering and adapting new models to solve them. Weil, Oyelere, Yeoh, and Firer (2001) studied students’ perceptions of the usefulness of case studies for the development of finance and accounting-related skills and knowledge. They found that the use of case studies enhances student learning by helping to develop certain thinking skills. These include requiring decision-making to solve real-world problems; dealing with uncertainty, ambiguity, and incomplete information by devising several innovative solutions; and application and integration of knowledge and theory through visualization of a myriad of possibilities. Garvin (2007, p. 369) states that, according to his experience and research, for MBAs, “Cases provide a form of simulated experience. They give students exposure to environments and roles that they have not yet encountered personally.” He also states that an instructor’s progression from novice to expert can be smoothed out by sharing knowledge and assisting fellow instructors in the best practices of using cases. Bruner (1999) identifies key elements of the successful use of cases in the finance classroom. These include appropriate case selection for the course level and objectives, highlighting the dilemmas of the decision-maker, getting the relevant numbers and critiquing them, embracing uncertainty, demanding the action recommendations arising from the analysis, looking for unintended consequences to the company, and exploring opportunities for further work or research. He explains that, “How we teach is what we teach.”

Current research provides information regarding the factors of performance in a quantitative business classroom, the benefits of using cases in the quantitative classroom, and an overall framework for implementing cases in a quantitative course. Interestingly, many of the factors deemed in the research as necessary for student success in a quantitative classroom correlate with the outcomes revealed in the students that use cases in the classroom. However, the current research is scarce on developing strategies for ensuring that students of quantitative courses in business schools receive the necessary level of technical skills demanded by employers for use in their future careers. This study provides key findings that will contribute toward the pursuit of this goal based on the unique perspective of institutions and faculty with long-standing commitments to the case method and instructional excellence.

Philosophy and Rationale for Using the Case Method of Learning in Quantitative Courses

According to interviews with the professors included in this study, schools that use the case method believe that the true value of an MBA program comes from self-discovery of truths, application of theory to real-world decision making, and collaboration with others versus merely the acquisition of facts. The classroom should be reserved for higher-level learning activities rather than the dissemination of facts from the professor as the “sage” to the students, who are considered “empty vessels.” The case discussion leaders in this study indicated their belief that MBA students are responsible, possess valuable experiences, and will be self-directed when this is fostered in them. Based on these assumptions, the students should
have the ability to teach themselves a significant portion of the quantitative material rather than using valuable class time teaching it to them. Instead, class time should be spent on more value-added activities and deep learning as described above. As a result, the observed case method-based, MBA programs place a significant burden for obtaining quantitative knowledge and theory on the students. However, these MBA programs provide them with the necessary tools to learn or solidify relevant quantitative theories, test their quantitative knowledge, and then challenge them in class to discuss and apply their quantitative knowledge. The professors described several methods used to help students obtain quantitative mastery of the material. These are presented in the following sections.

**Recognizing Ambiguity of Quantitative Analysis**

Case discussions seek to ensure foundational quantitative knowledge and skills in students. However, professors desire for students to recognize that there are many ambiguities surrounding seemingly black-and-white calculations based on varying assumptions, constraints, risk and return objectives, amounts of available data, options and choices, and stakeholder demands. In an interview with Professor Peter Tufano at HBS, he stated that even technical models have limitations and ambiguities and often the parameters are gray. Based on the interviews and observations, students of case discussions must combine technical skills with reasoning in order to effectively utilize quantitative models and formulas. The students must be able to evaluate and consider the variables used in the model. They must use common sense and reasoning to recognize whether the outcomes of the model seem valid and are applicable to the specific decision and case. They must be able to challenge the assumptions used in the formulas. They must use the calculations in the context of varying demands of diverse stakeholders. They must listen to other students’ practical experiences regarding how this model is used in the real world and understand that the theoretical versus realistic implementation of a model often varies significantly. Students must seek to integrate and consider the many different variables and constraints of the case when utilizing models and formulas. This approach ensures that students obtain necessary quantitative skills but are also able to recognize the limitations and constraints that must be considered when implementing the formulas and models in real-world situations.

**Less is More**

The case discussion leader interviews revealed several perspectives on the students’ acquisition of quantitative knowledge in a case discussion class as compared to students in lecture classes. Many professors stated that one of their philosophies as case discussion leaders in finance is that “less is more.” During an interview with Darden Professor Ken Eades, he stated that case discussion students may not be able to explain the theoretical underpinnings of a model as well as lecture students, but they can more effectively explain how it is used, consider varying assumptions and constraints, and ascertain what to do with the data in order to make a decision. He stated that case discussions use a learning process of “applied repetition” in which professors cover less material but investigate each topic area several times and apply the material to real-world issues. This method is compared to the lecture-based approach, which often covers a larger breadth or quantity of material and focuses on the theoretical underpinnings of the model rather than its application to decision-making. The professors stated that students need to acquire quantitative knowledge but also indicated that it is just as important for an MBA student to learn how to use the quantitative information to make decisions rather than simply stopping at the analysis or calculation. In an interview with Darden Professor Matthew McBrady, he stated that case discussions focus on the core competencies required for financial managers and place an emphasis on mastering these quantitative competencies and integrating them into the workplace.

**Best Practices for Ensuring Technical Knowledge in Quantitative Case Method Courses**

**Readings**

Both schools require students to read selections in a well-respected finance textbook and in additional supplemental articles. These readings cover the theories and quantitative material that will be integrated in the upcoming cases. The courses are divided into modules which represent key topic areas such as capital
structure, option pricing, hedging and exchange rates, corporate valuation, financial policy and strategy, mergers and acquisitions, and cost of capital. The required readings cover each of these topic areas.

**Technical Notes and Online Tutorials**

Darden provides students with technical notes that describe difficult models or formulas which will be integrated in the cases for that week. These are available to the students online and provide them with a description of the model, several examples of how the model is used, and how to analyze the data obtained from the model or formula. These technical notes have generally been written by the professors at Darden, based on the knowledge that students need to acquire or solidify for the upcoming cases. Often these technical notes accompany the cases or are provided as online supplements, which are available to professors outside of Darden.

HBS’s approach to providing students with technical knowledge is to utilize online tutorials called Zoologic, which take them through the quantitative material that will be applied in the upcoming cases. For example, one tutorial is entitled, “Introduction to Options.” The tutorial describes the theory, assumptions, use, and application of options. It provides students with examples throughout the tutorial to test their knowledge of the theory or model by requiring them to perform a calculation or answer a question. The tutorial then provides them with the correct answers after they have given their answers. These Zoologic tutorials are optional and provide students who feel deficient in the topic for that week with a resource which will provide them with the quantitative knowledge necessary to conduct the cases for that module. Those with extensive practical or theoretical experience or knowledge in finance may choose to bypass the tutorials. HBS purchases the Zoologic tutorials from an outside company but then customizes the covered topics to meet the knowledge requirements of its students for specific learning modules and related cases.

**Case Questions**

The case assignments at both schools list specific questions and calculations that the students are required to conduct in order to understand effectively and analyze the case. Students must be prepared to answer these quantitative questions in class and thus have a strong understanding of the quantitative material and calculations in the case. For example, HBS offers the following case questions regarding managing working capital:

1. How was Dell’s working capital policy a competitive advantage?
2. How did Dell fund its 52 percent growth in 1996?
3. Assuming Dell sales will grow 50 percent in 1997, how might the company fund this growth internally? How much would working capital need to be reduced and/or profit margin increased? What steps do you recommend the company take?
4. How would your answers to Question 3 change if Dell also repurchased $500 million of common stock in 1997 and repaid its long-term debt?

These questions are often quantitative in nature, requiring calculations and the use of formulas and models. However, they also require students to use analysis and integration of the quantitative data to answer the questions. Some of these questions were asked by the professor during the case discussion, while others were simply included to help students think through and analyze the quantitative data and begin to understand some of the required decisions and issues that could emerge during the case discussions.

**Theory Integrated in the Cases**

Another source for ensuring quantitative knowledge and skills in a case discussion course is through the integration of technical and theoretical explanations imbedded in the cases. The cases present data and information from actual, real-world problems or dilemmas that have occurred within an organization. Often a paragraph is inserted in the written data presentation of the case describing a technical concept, theoretical underpinning, or practical use of an instrument or mechanism in the real world. For example, if the emphasis of the case is developing the weighted average cost of capital (WACC) in order to value a company, the case may include a section that walks the student through the process of developing the WACC. Thus, the student receives technical explanations as it relates to a specific problem as needed. This
can augment and solidify a student’s ability to recognize and understand the application of theoretical or technical material in order to solve a realistic problem rather than simply learning theory in a vacuum.

Optional Summer Prerequisite

Harvard and Darden both offer optional summer prerequisite courses for students which provide intense quantitative analysis, guidance, and review. Many students with minimal practical experience or academic knowledge in quantitative areas such as finance or statistics choose to take these electives in order to provide them with additional foundational quantitative knowledge, and skills to prepare them for the rigors of the case discussion MBA program.

The integration of readings; technical notes; online tutorials; case questions; theory integrated in the cases; and the summer, quantitative, prerequisite courses provide students with multiple opportunities to expand their quantitative knowledge and skills. However, many of these resources are optional to students and require outside time, preparation, and study by the student. This allows students who already possess strong quantitative knowledge and skills, through either work experience or academic study, to avoid wasting time listening to lectures that are redundant to them, as in other programs. Many of these resources replace the professors’ lectures, as used in other passive method schools, and allow the students to self-learn these skills rather than depending on the professors’ explanations. The professors explained that this leaves time in class for higher, value-added activities and learning via the application of theory to practical decision-making through case discussions rather than using the time for listening to and memorizing theory and formulas from lectures. The students are advised before beginning their programs that, in order to be successful in this case-based curriculum, they must ensure that they possess or obtain the necessary theoretical knowledge by using these tools provided by the school.

Lecturettes and Interactive Lectures

Some critics of the case discussion style of teaching believe that professors infrequently provide direction or offer explanations of quantitative material in class. Based on the interviews and observations of finance faculty at HBS and Darden, this perception is inaccurate. During an interview with HBS Professor Peter Tufano, he explained that, during the first year of the finance program, professors lecture 5 of the 30 sessions in each semester. However, these lectures are not unidirectional from professor to student. The lectures are still interactive with frequent questions and answers and application of the theory or formulas to practical examples. Thus the lectures are still an exercise in active learning rather than strictly passive in nature. These lectures are generally either conducted at the beginning of a module or for topic areas that are extremely technical or quantitative in nature and would be difficult for the students to understand solely through the self-teaching resources provided. For example, when the students begin a module on option theory, the professors may begin the module using PowerPoint slides to walk through the process of using the Black-Scholes model to value options. They will then walk through several examples on the board with the students to ensure their ability to use this model in a practical manner to solve problems.

In addition, professors often weave in what they refer to as lecturettes throughout the case discussions. These lecturettes often cover a technical concept that students are struggling to understand or apply. They are often conducted spontaneously by professors in response to their perceived confusion from students and often over quantitative material. They generally only last five minutes or less and are immediately followed with application or questions to the students regarding how to implement this material in the case. For example, during a classroom observation at Darden, Professor Ken Eades recognized some confusion in the class between operating and financial leverage and then provided a lecturette on the differences between them. Darden Professor Matthew McBrdy conducted a lecturette on a new financing instrument and then brought the discussion back to a practical question by asking, “Why did they use this kind of debt instrument in the case?” A classroom observation of HBS Professor Nabil El-Hage revealed that he inserted a lecturette on factoring receivables and then related it to a practical example of personal mortgages in order to help students understand and apply it. He also asked if any students had practical experience with factoring receivables. HBS Professor Ken Froot seamlessly wove in a description of zero-coupon bonds and OIDs (original issue discounts) as he was speaking and then immediately led into a question which applied this knowledge to the case.
These interactive lectures and brief lecturettes allowed the professor to integrate quantitative knowledge into the course without depending on them as the primary sources of student knowledge. They were brief in nature and were normally conducted spontaneously when it became obvious to the professor during the case discussion that confusion existed over a specific concept. They were still interactive in nature by integrating questions and the inclusion of student experiences to the explanations. The lecturettes and interactive lectures are additional tools for the case discussion leader to integrate in order to ensure quantitative knowledge while still emphasizing student self-discovery and learning.

End-of-Module Notes and Online Practice Problems

Darden provides students with end-of-module notes which review the core competencies, broad concepts, and key quantitative skills that the students should have gleaned from that module. These module notes integrate both quantitative and conceptual information to help the students feel confident that they have mastered the key components of the module. HBS offers online practice problems at the end of each module. These questions are multiple-choice and require calculations, the use of formulas, and adequate quantitative skills in order to answer them correctly. The students are required to conduct this review because it helps them identify their areas of quantitative weakness and then prepare adequately for the end-of-module quiz.

Quizzes and Exams

Harvard provides students with online quizzes at the end of each module which test their quantitative skills from the previous learning module. The quizzes are similar to the review problems by using multiple choice questions which require technical analysis and the use of quantitative skills. HBS Professor Peter Tufano stated that the quizzes have recently been implemented in order to provide feedback to both the students and faculty. The quizzes represent 20 percent of the overall grade. During an interview, Peter Tufano stated that the quizzes are an evaluation tool but are also intended to provide students with feedback. He stated that feedback is designed to occur soon after the event with the purpose of recommending areas of improvement, should be a normal part of the program and life, and will identify progress and deficiencies. The quizzes help the students gauge their progress in the key quantitative areas and recognize their deficiencies. This should motivate them to participate further in the quantitative resources available to them. The quizzes highlight the key quantitative areas that the students should be mastering from each module. They also provide the students with confidence that they have mastered the core quantitative skills of the module which then frees them to focus on the integration of these skills to the case discussions. The quizzes also help prevent the students from falling behind in the course by allowing them to recognize quickly their deficiencies and then seek additional help and resources. The quizzes also provide professors with frequent feedback of how well students are grasping the quantitative skills expected from the module. They can then adjust their case discussions by providing some additional lecturettes during class or reviewing some of the quantitative areas where students seem to show deficiencies.

The final exams are different from the quizzes in that they are case-based rather than black-and-white quantitative questions. They are comprehensive in nature and cover many of the key concepts discussed during the course. They require the integration and application of quantitative skills to make decisions and devise a plan of action. These exams simulate the case discussions conducted in class but require the student to complete them individually rather than collaboratively in order to test their individual comprehension and course knowledge.

Weekly Tutorial Sessions and Mentoring Programs

Harvard Business School offers weekly tutorial sessions for students, led by the department’s teaching assistants (T.A.s). These sessions are available to students who are struggling with the material or would like to glean further understanding and reinforcement of the previous week’s case issues. The sessions provide students with the opportunity to ask questions of the knowledgeable T.A. and get answers to specific quantitative questions. The T.A.s answer questions related to the case discussion issues and specific quantitative calculations or skills. They also provide students with some practice questions and
mini-cases to work through in order to obtain additional practice and exposure in using the technical models or formulas. The T.A.s then report back to the professors how students seem to be progressing in terms of their quantitative skills and conceptual understanding. Darden offers first-year students with an opportunity to participate in a mentoring relationship with second-year students who have displayed strength in that specific discipline. Second-year mentors are available on an as-needed basis in order to help students understand quantitative material, learn how to practice effectively and prepare, or explain difficult concepts and core issues from the courses.

**Forcing Quantitative Support, Analysis, and Calculations**

Based on the interviews and observations, professors required case method students to substantiate their opinions and decisions with data, facts, and calculations from the case. The case discussion observations revealed that the professors often asked the students to support and reference the case data when answering a question or giving their opinion, as exemplified by the following instances. During a classroom observation, Darden Professor Yiorgos Allayannis responded to a student’s comments by stating, “Do we have evidence of this from the case data?” A classroom observation revealed that Darden Professor Ken Eades asked a question to the students and then referred them to the financial statements for their answer. Darden Professor Matthew McBrady directed his class to analyze the financial statements and determine what was driving the EBITDA, a measure of profitability. HBS Professor Ken Froot referred students to data in the appendices to answer the questions. He often challenged the students by asking, “Can you point to facts in the case that would lead you to believe that?” He referred students to the graphs and then forced them to weave in analyses of the quantitative data. HBS Professor Nabil El-Hage asked practical questions to the students which required them to analyze the data. He asked the students, “How much cash do we need?” and “Which model should we use to conduct our analysis?” Finally, HBS Professor Peter Tufano asked a student whether there were any quantitative facts in the case that supported their view that the fear of competition was the motivation of the protagonist.

The professors often called on students to describe a model or explain technical material. HBS Professor Nabil El-Hage called on a student to describe a complex investment tool and explain how it worked to the class. He then followed this explanation with his own brief summary of its function and use. Throughout the classroom observations, professors often drew charts, models, or graphs to help explain technical material. They then asked the students to describe the model in theory, apply it to the case problems using the data given or calculated in the case, and then explain how the data from the model could be used to make a decision. Many students immediately raised their hands when another student offered an incorrect answer or assumption in his/her quantitative calculations. Thus, the students quickly discovered the errors and the accurate or alternative way to use the model. It was apparent from the finance class observations that professors did not allow the students simply to offer their opinions or ideas without sufficiently supporting them with case facts, calculations, and analyses. They also frequently referred students to case data or the use of a formula when answering questions or giving their opinions. However, the calculations and use of formulas were performed in the context of the case constraints and with the purpose of answering the specific case problems or making a decision as compared simply to performing a calculation as an end in itself.

**Conclusion**

This article provides findings based on the insights from interviews, document review, and observations of Harvard and Darden Business School finance professors which describe their recommendations and practices in ensuring students’ technical knowledge and evaluating finance case method classes. The 10 key elements for ensuring students’ technical knowledge include (a) Readings; (b) Technical Notes and Online Tutorials; (c) Case Questions; (d) Theory Integrated in the Cases; (e) Optional Summer Prerequisite; (f) Lectureettes and Interactive Lectures; (g) End-of-Module Notes and Online Practice Problems; (h) Quizzes and Exams; (i) Weekly Tutorial Sessions and Mentoring Programs; and (j) Forcing Quantitative Support, Analysis, and Calculations. The unique information gleaned from this study of experienced practitioners of the case method in finance at Harvard Business School and Darden Graduate School of Business can serve as a valuable resource for educators using this method to integrate in their classroom or programs. It provides practical steps that professors can implement when using cases to
ensure that their students receive the necessary quantitative knowledge required for in-depth case analyses and as part of their permanent knowledge acquisition upon completing the class.

References


Recorded Personal Interviews with Professors:
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- Dr. Ken Froot, Harvard Business School
- Dr. Stuart Gilson, Harvard Business School
- Dr. Matthew McBrady, Darden Graduate School of Business Administration
- Dr. Yiorgos Allayannis, Darden Graduate School of Business Administration
- Dr. Ken Eades, Darden Graduate School of Business Administration
- Dr. Mark Haskins, Darden Graduate School of Business Administration
- Dr. Sherwood Frey, Darden Graduate School of Business Administration
- Dr. Ron Wilcox, Darden Graduate School of Business Administration
- Dr. Robert Bruner, Darden Graduate School of Business Administration

