



## Undergraduate research: the senior thesis in finance

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### Abstract

An undergraduate senior thesis offers the individual student an opportunity to pursue a topic of special interest or in greater depth than available in a traditional course. This paper describes the Senior Thesis in Finance required of all finance majors enrolled in The College of New Jersey, specifies the objectives of the thesis, and offers the results on an assessment survey of alumni, who completed the senior thesis. © 1999 Elsevier Science Inc. All rights reserved.

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### 1. Introduction

Instituting a senior thesis for undergraduate majors can offer both students and faculty an opportunity for a challenging academic experience. By emphasizing a single topic, which is covered in depth, the senior thesis serves objectives that are distinct from traditional courses. It can tie together material learned in various business courses and allow the student to explore one topic in detail. The senior thesis can also be used to investigate an area in finance not offered by the major, which broadens both the appeal of the school's program and marketability of the student.

This paper discusses the senior thesis in finance at The College of New Jersey (TCNJ).

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The paper begins with a brief description of the TCNJ finance program. Next follows the mechanics of the course, objectives of the senior thesis, assessment, and special problems. The primary purpose of this paper is to report the TCNJ experience and initial efforts to assess it. Faculty at other institutions who are considering initiating a senior research project for majors should also find the discussion of the mechanics and implementation problems useful.

## 2. The TCNJ finance program

TCNJ is medium-sized school of about 6,000 students with average SAT scores of 1,200. The School of Business has approximately 1,000 undergraduate students with 200 freshman admits and 50 transfers each year. (No graduate degrees are offered by the School of Business.) There are 30 to 34 faculty in the School of Business, depending on how administrators who also teach are counted. The finance program has about 160–180 majors (about 40 graduates a year) currently being taught by four faculty. When the senior thesis was started, the number of majors was about 120 with three full-time faculty. While new faculty do not supervise theses during their first year, they are integrated into the program during the spring semester of the second year. Adjunct faculty are used to teach finance courses but not the senior thesis. The number of adjunct faculty varies each semester, as regular faculty are granted release time for research or administrative duties.

The finance curriculum is part of the School of Business, which offers traditional business programs in accounting, economics, general business, international, management, and marketing as well as finance. The finance program consists of

1. A general education core
2. A core of business courses consistent with AACSB requirements
3. Six courses (18 credits) in finance above the intro course required of all majors in the School of Business.

Four of the six finance courses are required (Introduction to Investments, Working Capital Management, Capital Budgeting, and Senior Thesis), and two “options” are chosen from such courses as Corporate Valuation, International Finance, Commercial Banking, Derivatives Securities/Portfolio Management, and Estate and Retirement Planning. If students were not required to complete the senior thesis, they would substitute one of the options. Thus, the alternative to the senior thesis (assuming the number of finance courses remains at six) would be to require the student to take three finance options.

National interest in capstone experiences increased during the 1980s in response to critical studies of American higher education. (See, for instance, the National Commission on Excellence in Education. *A Nation at Risk: The Imperative for Education Reform*, 1983 or the Association of American Colleges. *Integrity in the College Curriculum: A Report to the Academic Community*, 1985.) The senior thesis in finance is one possible capstone experience. In a wonderful analogy, Heinemann (1997) classified senior experiences as either “domes,” which are designed to integrate and unify a body of knowledge, or “spires,” which are designed to focus on further exploration in a specific area.

The TCNJ senior thesis in finance is designed as a “spire.” The School of Business has its own capstone course (Strategic Management) which integrates material from the various functional areas of business. The required courses in corporate finance give students a thorough grounding in financial theory and applications and the required course in investments repeats some of this material from a different perspective. Hence, a unifying capstone course is unnecessary.

The senior thesis in finance was started in 1992 and initially only a handful of students (transfers into the program) had to complete the thesis. Students who enrolled prior to establishing the requirement were exempted. During the phase-in period, one faculty member handled all the theses except for a few specialized topics that were covered by another faculty member on an ad hoc basis.

Senior thesis sections are scheduled as a regular course with specified hours and specified rooms. While traditional courses have 25–30 students, enrollment in a section of senior thesis is capped at ten students. Under optimal conditions, this distribution implies each of the four faculty would have one section of ten students during the spring semester. This distribution of the workload assumes the number of majors remains stable at approximately 40 students each year and all students complete the thesis during the spring semester. However, the number of majors does fluctuate, so a given section may have fewer or more than ten students. In addition, not all students can complete the thesis during the spring. To meet this need, one section is offered during the fall semester.

Since the senior thesis is treated as any other course, students sign up for individual sections. The faculty member responsible for the section is identified in the roster of courses. From prior course work, students know the areas of the various instructors (e.g., investments, international, or financial institutions) and enroll in the appropriate section based either on their desire to work in a specific area or to work with a specific instructor. As with any other course, the instructor cannot refuse to work with an enrolled student.

How an individual section is conducted depends on the instructor. Usually during the first week a formal class is held to identify topics and start the general process described in the next section. Additional classes may be held at intervals during the semester to meet specified progress milestones. Since the section has a specified meeting time and place, both student and faculty know there is a time available at which they can meet. This avoids the problem of not being able to find a mutually convenient time for meetings but does not preclude meetings at different times or at different places such as faculty offices, computer labs, or the library.

### **3. The mechanics of the TCNJ senior thesis**

While there are differences among each instructor’s approach, the following gives the general process for the student’s completing the senior thesis. The first step is for the student to identify a topic. Undergraduate courses in the functional areas of business generally start at the junior level, so students will have completed at best a modest amount of coursework in finance. Students with topics need guidance to refine and make the thesis manageable for

the short period (one semester) during which they have to complete the project. Students tend to be too ambitious with regard to scope, and the better defined or focused the topic, the easier the project will be for both the student and the faculty member.

Students who have not identified a topic require more initial assistance. A series of questions such as (1) What areas did you enjoy in your course work? (2) What do you plan to do upon graduation? or (3) Do you have a special interest that may be tied to finance? may help the student identify a particular area of interest. Flexibility on the part of the faculty member helps. For example, one finance student expressed a desire to work for the FBI upon graduation, which led to a senior thesis on white-collar crime: bank fraud. While bank fraud is not a traditional or typical finance topic, the thesis resulted in the student interviewing FBI agents as well as researching traditional finance literature. The topic also helped the student understand how the finance major could contribute to a career in law enforcement.

Individual students are permitted to pursue similar topics. For example, comparing mutual fund performance is an area that is potentially useful to a finance major considering a career in financial planning. Students who are working on similar topics are encouraged to share information, but each thesis is individually written and goes through the process of review and revision. There are no joint projects.

The knowledge and interests of the faculty also affect the selection of a topic. A student, however, may want to pursue a topic about which the faculty member has, at best, modest knowledge and, at worst, knows virtually nothing. An alternative approach discussed in Amyotte (1989) is to determine a set of senior projects and let the student select a topic from the list. Having a list improves the faculty member's comfort level but relieves the student of having to identify a topic. The list also may reduce student interest and defeat one of the objectives of the senior thesis to pursue an area of special interest. Since the discomfort problem can only occur if the student suggests the topic, instructors have to balance their discomfort level with the possible enthusiasm the student may have for the topic. Unless the topic is far afield, it is unlikely that someone cannot be found to supervise the thesis.

After selecting the topic, the student is asked to complete a literature search. Since one of the objectives discussed in the next section is exposure to academic literature, each student is encouraged to find readings in the *Journal of Finance*, *Financial Management*, the *Journal of Portfolio Management*, or the *Financial Analysts Journal*. The business reference librarian then helps identify which publications are immediately available and which require interlibrary loan. (The School of Business covers the costs of interlibrary loans.)

If the topic requires data, the librarian can also help the student locate or access a database. Obtaining data are often a major constraint on the undergraduate thesis. Inaccessibility of data available in a timely fashion or the need to limit the amount of data forces the student to answer many questions. Should the sample size be reduced? Should annual, monthly, or weekly data be used? What time period should be covered?

In addition to the bibliography, the student submits a statement of purpose. The statement is corrected for grammar, form, and content. Students subsequently submit a section on methodology, a presentation of results, and other appropriate sections as completed. Submissions are returned with comments and encouragement. This system contributes to original work and reduces the potential for cheating.

Table 1  
Selected titles of senior theses

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A Comparison of 401(k) Plans
Art as an Investment
Credit Card Arbitrage
Escrowed to Maturity Bonds: Call Provisions and Yields
Financial Leverage and Risk in the Retail Department Stores Industry
Insuring Mutual Funds with Stock Index Put Options
Manager Tenure as a Predictor of Mutual Fund Performance
Municipal Bond Defaults, 1988–1992
Predicting Airline Bankruptcy
Price Appreciation of Vintage Claret
Residual Price Difference Between Japanese ADRs and Their Underlying Securities
Returns to Investments in Cartoon Art
Socially Responsible Investing

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Faculty comments serve several purposes. First, the suggestions help refine the topic and make it more manageable. Second, the student becomes more aware of the importance of grammar, organization, and structure. Third, the comments help the student develop self-criticism. Many students will have to write more during their careers than they currently realize and now is the best time to start becoming more aware of the need to develop self-criticism and improve writing skills.

After the paper is finished (or virtually finished except for the last rewrites), the student gives a 15 to 20 min oral presentation. Four to six students give their papers at a session. After completion of the presentation each student attending the session is expected to ask at least one question which forces everyone to listen.

The topics covered by the students have been varied, especially those selected by the students themselves. A brief list of titles is provided in Table 1. Students who want to work with a specific instructor may select a topic that both instructor and student find interesting. These topics may not be as varied, since the faculty member may direct the selection process. Since many finance students prefer investments, a large percentage of theses (perhaps as many as 50%) are completed in that area. The growth in enrollment in international finance has generated topics in that area, which in some cases combine investments and international.

While publication is not an objective of the senior thesis, an occasional thesis has been published or presented at professional meetings. (See Table 2 for titles of articles and presentations that have evolved from the senior thesis.) All senior theses that are published or presented at professional meetings are the joint work of the student and the sponsoring faculty. Refining the thesis for possible presentation or publication requires considerable work and effort by both the student and the faculty member. Even if a student does exceptional work, the review process operates against publication. The need to revise and resubmit requires the student to continue working on the thesis after graduation. Most students' jobs and other constraints make subsequent revisions difficult, but the successes given in Table 2 are exceptionally gratifying to both the student and the sponsoring faculty member.

Table 2

Senior theses that have been published or presented at professional meetings

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- Kagan, G. & Mayo, H. (1995). Risk-adjusted returns and stock market games. *Journal of Economic Education*, 26, 39–50.
- Landis, M. & Patrick, T. (1998) Mutual fund risk and return. *Proceedings of the Northeast Business & Economic Association*, Annual Meetings.
- Paladino, M. & Mayo, H. (1995). Investments in REITs do not help diversify stock portfolios. *Real Estate Review*, 23–26.
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- Pikul, J. & Mayo, H. (1999). Performance and eligibility for arbitration or free agency and salaries of professional major league baseball players, the 1994–1995 experience. *Journal of Sport & Social Issues*, 23, 353–361.
- Philbrook, L. & Patrick, T. (1999). The relationship between bond ratings and yield curves. *Proceedings of the Northeast Business & Economic Association*, Annual Meetings.
- Wunder, G. & Mayo H. (1995). Study supports efficient-market hypothesis. *Journal of Financial Planning*, 128–135.
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#### 4. Senior thesis objectives

The objectives for the senior thesis include the following.

##### 4.1. Opportunity to pursue an individual interest

One important advantage of the senior thesis is the opportunity for the student to pursue something of personal interest. For those students, who have a general area they wish to pursue or a well-defined topic, the senior thesis provides an opportunity and incentive to explore their special interest. The thesis may also be used to cover a topic that may be important for career goals but that is not taught in existing courses. For example, a student interested in pursuing a career in financial planning may write a thesis on charitable annuities, which are not currently covered in existing courses.

##### 4.2. Development and application of research skills

The senior thesis presents an opportunity to apply analytical skills learned in specific finance courses and to use statistical, accounting or other analytical tools learned in various courses. While not every student pursues a topic that applies specific skills (e.g., regression analysis), an effort can be made by the faculty to encourage topics that involve analytical tools learned in finance and other courses.

### *4.3. Oral and written communication skills*

The development of oral and written communication skills is one of the most important goals of the senior thesis. Each student completes a written paper and gives an oral presentation of the results.

### *4.4. Interaction between student and faculty*

Increased interaction between faculty and student is more than a fringe benefit of the senior thesis. It forces one-on-one interaction between the student and the faculty member. While the process is time consuming and requires willingness on the part of the faculty member to work individually with the undergraduates, both the student and the faculty member can benefit. For example, letters of recommendation with substantive comments concerning the student's academic ability and communication skills are easier to write. Relationships after graduation are easier to maintain, which helps current students who are looking for internships or a job after graduation.

### *4.5. Literature exposure*

Many undergraduate courses in business do not expose students to primary research. All courses have time constraints. The use of problems, cases, and other instructional tools in business courses often comes at the expense of academic literature. One goal of the senior thesis is to introduce this type of academic literature. While most undergraduates cannot be expected to read and understand the majority of material in academic journals, they can be made aware of its existence. This exposure to research materials gives the student some indication of what advanced study in the discipline will cover.

### *4.6. Product differentiation*

TCNJ operates in a competitive market for quality students. Several colleges exist within a radius of fifty miles, and many offer programs in business with finance majors. The ability to study with an individual professor at the undergraduate level differentiates the TCNJ program from the majors offered by other schools in our immediate geographic area. Finance programs are offered at Lehigh University, Seton Hall University, Rider University, Villanova University, and Lafayette College. Each of these programs has a course with a title such as Directed Research, Independent Research, Independent Study, or Special Topics. Several (e.g., Lafayette and Villanova) have a thesis as a requirement in their honors program. None of the programs, however, requires a senior thesis of all undergraduate finance majors.

The same concept applies to the students who have to compete against graduates from other colleges and with other majors from TCNJ. Just as the TCNJ finance program uses the senior thesis to differentiate the school's program from competing finance programs, individual students may use the thesis to differentiate themselves from their competitors. Since finance majors have had similar classes, the senior thesis becomes a means to indicate the



uniqueness of the individual. Some students have reported that interviewers do become fascinated with the topic and that a large proportion of the interview was devoted to the thesis. While it may be impossible to know if the thesis results in better employment opportunities, it provides an opening for the student to discuss specific skills and to impress the interviewer.

## **5. Assessment**

While courses have objectives, the determination if the objectives are met requires assessment. Identifying strengths and weaknesses may help provide evidence of the senior thesis's effectiveness. In addition to determining if the specific objectives were being met, we wanted to learn if the graduates believed that the thesis should be continued or if it would be more beneficial to substitute another finance course.

When the Senior Thesis was instituted, the finance faculty members were concerned with the writing abilities of their students. Interest in improving writing skills was also a concern of the School of Business, which was pursuing AACSB accreditation. Since written communication skills are an important component of AACSB accreditation standards, the School was considering alternative means to integrate writing into the curriculum. Finance, however, was the only program to institute a senior thesis and questions arose concerning its appropriateness for a business program (the thesis stresses academic writing) and whether the thesis could serve as a model for the School or the College. (Other programs in the School of Business require a thesis for honors students but not for all students. Economics and marketing require senior projects, which may be broader than the academic emphasis placed on the senior thesis in finance. The College as a whole is considering some type of senior experience for all students.)

The initial consideration for assessing the senior thesis was to use the evaluation form that students complete for every course. It became apparent, however, that this form would not do. Questions such as fairness of tests or the use of class time do not apply to the senior thesis. Surveys of graduates made by the School of Business were too general and at best produced only anecdotal evidence concerning the senior thesis. A separate questionnaire was sent to ninety-two finance majors who had graduated after the senior thesis had been instituted and whose addresses could be obtained from the College's Alumni Office.

The questionnaire was constructed by one finance faculty member and the business reference librarian. The questionnaire was purposely kept brief in an effort to encourage a better response rate. The questionnaires were sent and collected by the business reference librarian instead of the faculty member. A total of 33 (35.9%) completed questionnaires were returned.

The questionnaire consisted of twenty-one statements and the individual was given five choices: strongly agree (5), agree (4), neither agree nor disagree (3), disagree (2), or strongly disagree (1). The statements were designed to cover the specific objectives, and most of the statements were written in the positive so that the larger number is a positive response. The statements (and the objectives they relate to), the average score, the standard deviation, and possible interpretation concerning the course's objectives follows.



### 5.1. *Objective: opportunity to devote time to a topic of special interest*

Statement: The thesis gave me the opportunity to spend time working on a finance topic of interest to me. —4.5 (av), 0.62 (SD)

I would have preferred an assigned topic instead of developing my own topic. —1.6(av), 0.77 (SD)

I would have preferred choosing my topic from a list of possible subjects. —2.5 (av), 0.92 (SD)

These results suggest that students thought the thesis gave them the opportunity to study a topic of special interest. While few supported being assigned a topic, they seemed somewhat ambivalent about been supplied a list from which to choose a topic.

### 5.2. *Objective: development and application of research skills*

Statement: I made use of research skills learned in other classes. —3.8 (av), 0.86 (SD)

The thesis did not build on any previous finance course. —1.7 (av), 0.78 (SD)

These results suggest that the senior thesis did build on finance courses and that some students did use research skills learned in other courses. The results also suggest that some students did not use skills learned elsewhere. This could be caused by insufficient skills being required by the thesis or the necessary skills were learned as the thesis progressed and not in other courses.

### 5.3. *Objective: develop oral and written communication skills*

Statement: Discussing my topic with others (students, faculty, librarians) helped improve my oral communication skills. —3.7 (av), 0.83 (SD)

My thesis presentation helped me develop my oral communication skills. —3.5 (av), 0.77 (SD)

Writing and editing my thesis helped me to develop my written communication skills. —4.5 (av), 0.51 (SD)

These answers suggest that the students believe the senior thesis helped their written communication skills and suggest that having to explain the topic helped improve oral communication skills. An opportunity may exist to further develop oral communication skills if students can be placed in a setting in which they have to explain the thesis (e.g., class meetings in which they discuss their topics and progress).

### 5.4. *Objective: increased interaction between faculty and the individual*

Student statement: The thesis allowed me to work closely with the professor. —4.8 (av), 0.91 (SD)

There was enough faculty/student interaction while I was working on my thesis. —4.6 (av), 0.61 (SD)

These results indicate that increased interaction is perceived as an objective and the objective is accomplished.

*5.5. Objective: exposure to academic and professional literature not normally covered in course work*

Statement: Researching my topic exposed me to research literature in academic finance journals. —4.2 (av), 0.71 (SD)

While this result suggests that students did get the desired exposure, the students in the survey predate the widespread use of the Internet by students. Whether this objective would be as readily achieved today is doubtful unless the instructor explicitly requires a specified minimum number of academic citations.

*5.6. Objective: differentiation of our graduates from those who attend other schools*

Statement: When interviewing for a job, the thesis helped separate me from other applicants. —3.6 (av), 0.77 (SD)

My current position is related to my thesis topic. —2.7 (av), 1.41 (SD)  
While anecdotal evidence strongly suggests that students use the thesis to differentiate themselves from other students, these results confirm that the thesis does differentiate but that the tendency is not strong. While few students appear to use the topic or general area in their employment, the large standard deviation suggests that some students are in positions related to the topic while others are not (i.e., the distribution is bimodal).

## **6. Additional information from the survey**

Resources are obviously an important part of a senior thesis. A byproduct of the senior thesis is that a closer working relationship can develop between the library and computer staffs and the faculty. Collection development of the library resources may be more specifically coordinated to support the thesis program. As Bailey (1985) points out, the librarian can assess the research capabilities of the library after leading students through the library's resources. Two statements concerning resources were included in the survey:

Statement: I was able to obtain the materials I needed through the library's services. —3.8 (av), 1.02 (SD)

The computer facilities were adequate to complete my thesis. —3.5 (av), 1.50 (SD)  
In terms of college resources the library fared better than the computer facilities. Since computer facilities are periodically upgraded, the survey, however, may not indicate if current facilities are sufficient.

In addition to resources, the senior thesis is expensive in terms of alternatives. That is, students complete the thesis at the expense of an alternative course. Faculty members have to supervise the students and since all majors must complete the thesis, it reduces faculty availability for other assignments. (There is also an implicit assumption that faculty are willing to supervise the senior thesis on a continuing basis.) Perhaps the biggest problem associated with the senior thesis is faculty resources. If ten students constitutes one class and four sections are taught during the spring semester, that is the equivalent of one faculty

member's total load. Thus, the senior thesis may increase the need for adjuncts or increase the size of other classes.

One suggestion for overcoming these problems is to have the thesis as an honors project only. The survey included four statements concerning these issues.

Statement: An additional finance course would have been more valuable than the senior thesis. —1.8 (av), 0.69 (SD)

The thesis should only be required as part of an honors program in finance. —1.9 (av), 0.95 (SD)

I think the thesis should be retained as a requirement for graduation. —4.3 (av), 0.90 (SD)

A thesis should be required of all majors in the School of Business. —4.3 (av), 0.96 (SD)

The results of all four statements indicate that the finance graduates favor the requirement for all students. The respondents viewed the senior thesis as being more valuable than another course in finance, that it should not be limited to the best (“honors”) students, that it should be retained as a requirement, and that the requirement should be extended to all students in the School of Business. Similar results were found in a survey of Princeton University's class of 1954, in which the undergraduate thesis stood out among the students' memories *twenty-five* years after graduation. The positive impact was remembered in statements such as “taking a mass of information, arranging it in a logical sequence and drawing conclusions . . . was a significant challenge” or “potential for personal growth . . . or in meeting the challenge is in my opinion enormous (Heath, 1979).”

## 7. Special problems

While the senior thesis can be an excellent learning experience for many students, it is naive to conclude that the senior thesis is a positive experience for all participants. For motivated students, who develop their own topics and can work at their own initiative, the senior thesis is a valuable learning experience. Some students become wrapped up in the process and develop a sense of accomplishment. This is particularly true for students who have a topic of personal interest. While it cannot be verified, anecdotal evidence suggests that the best work is often done by the above average student (GPA of 3.0 to 3.4) but not the best students (GPA exceeding 3.4). This belief is one of the arguments for requiring the senior thesis for all students and not limiting the thesis to a selected few students.

In addition to generating interest in a specific topic, students often become interested in the learning process as they rewrite and revise their work. While such enthusiasm does not apply to all students, it does apply to many, and the level of this enthusiasm appears to be greater than for a formal course. Even for weaker students with major gaps in their backgrounds, the senior thesis can offer an opportunity to improve important skills and develop the responsibility associated with working on your own.

However, as Prud'homme (1981) so aptly expresses it: “. . . the thought of dragging an unmotivated, unwilling, and ill-prepared student through a year of senior thesis research sends chills up my spine.” The unmotivated and unwilling student poses a real dilemma. While fear or lack of motivation has resulted in some students changing their major, some students start the process and then disappear so that the student becomes one course short of

graduation. While being ABD is not unusual for graduate students, such a status generally does not apply to undergraduates. It raises an important question: should a student be denied graduation for failing to complete one requirement that is unique to the specific program? Currently, the answer depends on the individual instructor. Since each instructor determines the student's grade, what constitutes acceptable work or what differentiates grades is left to the discretion of the instructor.

## 8. Concluding comment

The TCNJ senior thesis in finance offers an opportunity to develop the research and communication skills of students who will soon become professionals. Whether the students enter industry or attend graduate or professional school, research will be an important component of their lives. Few students realize how important research and communication skills may be for their careers. The TCNJ senior thesis in finance gives our faculty an opportunity to focus on these skills in a manner that is not possible in an individual finance course and thus differentiates our majors from those graduating from institutions not offering this academic experience.

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