

The University of North Carolina at Charlotte

**Doctor of Philosophy in
Business Administration**

**Request for Authorization
to Plan**

Appendix B

The University of North Carolina Request for Authorization to Plan a New Doctoral or First Professional Degree Program

Date April 23, 2004

Constituent Institution: University of North Carolina at Charlotte

CIP Discipline Specialty Title: Business Administration and Management, General

CIP Discipline Specialty Number: 52.0201 Level: D 1st Prof.

Exact Title of the Proposed Degree Ph.D. in Business Administration

Exact Degree Abbreviation (e.g. Ph.D.,Ed.D.): Ph.D.

Does the proposed program constitute a substantive change as defined by SACS? Yes No

a) Is it at a more advanced level than those previously authorized? Yes No

b) Is the proposed program in a new discipline division? Yes No

Approximate date for submitting the Request to Establish proposal (must be within two years of date of authorization to plan): May 1, 2005

Proposed date to establish degree: month August year 2006
(Date should allow at least three months for review of the request to establish, once submitted.)

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1. Description of the Proposed Degree Program.

1a) A brief description of the program and a statement of educational objectives

The foremost mission of the Ph.D. in Business Administration will be to provide a research-oriented program in business that is designed to prepare graduates for teaching and research careers in academia. The program will include core courses covering all business specialties, combined with an in-depth study in both theoretical and empirical aspects of the major and minor field. Students will also be provided with training in pedagogy. Students will be expected to demonstrate mastery of the existing body of knowledge in their major and minor field and be able to develop new knowledge through original independent research. With the educational background provided by the program, graduates will be qualified for tenure-track assistant professor positions at both national and international research and teaching universities and other educational institutions.

The proposed Ph.D. in Business Administration may eventually encompass majors in other business fields. However, this proposal is focused on the proposed initial major within the Ph.D. in Business Administration; namely, a major in Finance and Financial Management Services (referred to as Finance hereafter).¹ The program in Finance will include an in-depth study of both theoretical and empirical/statistical aspects of the fields of finance, mathematical finance, and financial economics.

In the past three decades, there has been a tremendous increase in demand—within the corporate, banking, insurance, real estate, financial services, and government financial sectors—for highly trained Ph.D.s in Business Administration with majors in Finance who are able to provide leadership in financial research, research in public policy, risk management, portfolio management, and investment strategies. Therefore, an additional goal of the Ph.D. in Business Administration with a major in Finance will be to prepare graduates for careers in the private sector. The curriculum of the program will be designed to provide the strong analytical training necessary to provide graduates with the option to choose career paths in either academia or private and government sectors.²

¹ Finance and Financial Management Services can broadly encompass all of the following specialties within the discipline: Financial Management, Financial Derivatives (including options and futures), Financial Engineering, Investments, Real Estate Finance, Insurance and Risk Management, Mathematical Finance, Multinational Finance, Personal Financial Planning, and Financial Institutions.

² Although similar skill sets are needed for financial research careers in both the academic and private sectors, students will be able to choose dissertation and other research topics that can provide them with any specific background requirements that are needed for their chosen career path.

From an educational perspective, the goals of the Ph.D. in Business Administration with a major in Finance can be summarized as follows:

- to provide students with educational opportunities in finance, economics, and mathematical finance, culminating in a research-oriented Ph.D. in Business Administration with a major in Finance
- to prepare students for careers in finance and financial management services who will lead in developing advances in the fields of finance, mathematical finance, and financial economics through theoretical and empirical/statistical research
- to involve students in the support and expansion of the base of research in rapidly growing fields related to business finance and financial management services in the Charlotte region, North Carolina, and across the nation and world
- to enhance the educational experience in business, finance, economics, applied mathematics and mathematical finance for all students, graduate and undergraduate, at UNC Charlotte.

The next part of this section addresses the proposed curriculum that has been designed to address and meet the mission and goals of the proposed Ph.D. in Business Administration, and more specifically the major in Finance, as well as meet the requirements of the University.

Proposed Curriculum Overview

The program of study for the Ph.D. in Business Administration will have seven components: business core courses, prerequisite courses, the major field, a minor field, a research component, a teaching component, and final examination. The program will be designed so that all students meet both the Graduate School and the Belk College of Business Administration's minimum hour requirements.³

Business Core Courses for the Ph.D. in Business Administration

To ensure that students are prepared for doctoral-level coursework in all business specialties, they will need to have had, at the graduate or undergraduate level, the equivalent of the following courses:

1. Foundations in Accounting
2. Macro and Microeconomics
3. Financial Management
4. Marketing Management
5. Management Policy
6. Foundations in Business Computing

³ The Graduate School of UNC Charlotte requires that any student earning a Ph.D. must have completed at least 72 post-baccalaureate semester-hours, including at least 18 hours of dissertation credit. It is a Belk College of Business Administration requirement that any program of study within the Ph.D. in Business Administration must require at least 42 semester-hours of doctoral coursework, regardless of other graduate hours that the student may have previously earned.

Students lacking coursework in business core courses will generally be required to take these courses at the MBA level.

Prerequisite Courses for the Ph.D. in Business Administration with a major in Finance

Finance is a technical field that draws upon several other business and mathematical backgrounds. Students will likely enter the program from a variety of educational backgrounds and not all students admitted to the program will have adequate preparation in each of these areas. To ensure that students are prepared for doctoral-level coursework, they will need to have had, at the graduate or undergraduate level, the equivalent of the following courses:

1. Calculus I
2. Calculus II
3. Calculus III
4. Linear Algebra
5. Probability and Statistics

Students lacking the mathematics courses will generally be allowed to take those courses at either the graduate or undergraduate level. At the Program Director's discretion, a student may be permitted to take combined courses to meet multiple prerequisites.⁴

Although unlikely, it is possible that a student may enter the program who has not taken a specific prerequisite or business core course but who has, nevertheless, acquired the same skill and technical abilities that the course would convey. In such cases the Program Director may waive the course.

Major Courses

A student will need to have at least 21 semester hours in finance major courses. Students majoring in Finance in the Ph.D. program will need to take the following major courses:

1. Theory of Finance
2. Theory of Corporate Finance
3. Asset Pricing
4. Investments and Portfolio Theory
5. Seminar in Applied Financial Research
6. Advanced Topics in Finance
7. Doctoral Research Seminar

⁴ The governance structure of the program and the role of the Program Director will be addressed in Section 6 of this document.

Courses for the Minor

It is anticipated that most students majoring in Finance in the Ph.D. program will elect to receive a minor in Economics. To fulfill this requirement, students will need to take the following economics courses:

1. Advanced Microeconomic Theory
2. Econometrics
3. Advanced Business and Economic Forecasting
4. Financial Econometrics
5. Advanced Microeconomic Theory II

Research Support Courses

Students majoring in Finance in the Ph.D. program will take the following research support courses:

1. Partial Differential Equations for Finance
2. Stochastic Calculus for Finance
3. Numerical Methods for Finance

Upon completion of all required coursework, students will take the qualifying examination. The qualifying exam will be a written exam consisting of two four-hour sessions, administered on consecutive days. The intent of the qualifying exam is to test students' mastery of the body of knowledge, and to demonstrate their familiarity with current research in the field. The qualifying exam will, therefore, cover topics addressed during doctoral coursework, seminars, and from current and recent journals. The qualifying examination will be written and graded by a designated committee.

Upon successful completion of a qualifying exam, a student will select an Advisory Committee. The Advisory Committee consists of three members selected by the student and approved by the Program Director and one Graduate Faculty Representative appointed by the Dean of the Graduate School. Additionally, the student will need to be continuously enrolled in dissertation hours. In the fall and spring semesters, in addition to being enrolled in dissertation hours, a student who has passed the qualifying exam also must be enrolled in a Dissertation Research Seminar.

Teaching Component

The program will also be designed to develop the student's skills in pedagogy. First, students will gain teaching experience through employment as teaching and research assistants during the first years of the program. Students without prior teaching experience will be assigned a faculty teaching mentor and will be required to attend a teaching workshop. After a year or two in the program, students will teach one or two courses as teaching assistants. The combination of apprenticeship training through the teaching assistantships, formal pedagogy, and actual instructor experience will allow Ph.D. students to develop their pedagogical skills along with their research skills.

Final Examination

It is a Graduate School requirement that each doctoral candidate must pass a final oral examination over the contents of the dissertation. This meeting will be open to all members of the University community.

1b) The relationship of the proposed new program to the institutional mission and how the program fits into the institution's strategic plan

The proposed Ph.D. in Business Administration with a major in Finance is consistent with both the Mission Statement and the Vision Statement of UNC Charlotte and it will expand the array of programs offered by UNC Charlotte at the doctoral level. This program will also make an important contribution to UNC Charlotte in its mission to provide excellent graduate-level education to professionals in the Charlotte region. In this aspect, the program will provide educational and economic advantage to the region. The Mission Statement of UNC Charlotte specifically identifies Business and Finance as one of its broad areas of concern to the region. This program will contribute directly to the region by providing graduates trained to enter high-level financial service industry careers that exist within the Charlotte region.

The program also meets the objectives for the current five-year academic plan for UNC Charlotte which includes the Ph.D. in Business Administration with a major in Finance as a goal and states, "Charlotte has emerged as one of the nation's leading centers for business, particularly in banking, insurance, financial services, real estate and retail trade. UNC Charlotte must be prepared to serve the employment market in these sectors and to address the multiple needs of the business community for continuing professional education and applied research."

The program in Finance also meets the goals of the Belk College of Business Administration. The five-year strategic plan for the College states as one of its goals, "to be recognized as the provider of outstanding academic programs in the area of financial services at the bachelor, master's and doctoral levels and to be recognized nationally and internationally for research in the financial services area."

1c) The relationship of the proposed new program to other existing programs at the institution

The proposed Ph.D. in Business Administration will build upon and expand the graduate programs in the Belk College of Business Administration, and will significantly enhance the instructional and research programs of the entire College. Presently the Belk College of Business Administration offers the following graduate programs: three master's degrees (Master of Business Administration, Master of Science in Economics, and Master of Accountancy); and, the Departments of Finance and Business Law and Economics in the College offer a master's program in Mathematical Finance jointly with the Department of Mathematics. The College also jointly offers, with the College of Information Technology, a Ph.D. in Information Technology. However, the College's participation in the IT Ph.D. is largely limited to the Department of Business Information Systems and Operations Management. In addition, the Department of Economics currently teaches two core courses for the Ph.D. program in Public Policy and two core courses for the Master of Health Administration program.

The Finance major of the Ph.D. in Business Administration will have a positive impact on, and synergy with, the Master of Science in Economics and the Master of Science in Mathematical Finance. These master's programs will be able to share some core courses with the Ph.D. program. Additionally, the presence of the Ph.D. program will help attract quality students to the master's programs, in that the ability to pursue a Ph.D. in Business Administration with a major in Finance may serve as an effective recruiting tool. For example, graduate students in these programs will have much greater opportunities to be directly involved with the research programs of the faculty. It is anticipated that as more master's students get involved with research programs, some of them will be interested in pursuing a Ph.D. in Business Administration. Thus, the master's programs could serve as an excellent feeder system of quality, well-trained students into the Ph.D. program. Also, the existence of the master's programs will help in attracting and recruiting students for the Ph.D. program, because the option to pursue one of these complementary and related master's degrees will exist for students who begin the Ph.D. program.

1d) Special features or conditions that make the institution a desirable, unique, or appropriate place to initiate such a degree program.

The financial sector that uses advanced financial techniques has experienced tremendous growth within the Charlotte region. The enormous presence of the banking industry in this region is very well known. At present, the Charlotte region represents the second-largest financial center in the United States. Eight of the nation's top 200 banks operate in the Charlotte region, and two of the top five banks in the country are headquartered in the City of Charlotte. With the exception of New York City, no other American metropolitan area can claim a larger presence of the nation's strongest financial institutions. Also, the energy marketing and pricing sector uses sophisticated financial techniques and this industry has a strong presence in the Charlotte region.

Because of the major presence and sophistication of the financial service industries in Charlotte, there is a growing demand for employees who have Ph.D-level training in finance. The Charlotte financial services community has asked UNC Charlotte to help fulfill this need for employees by providing graduate programs in finance. Thus, it is a natural progression for UNC Charlotte to develop and offer Ph.D-level education in Business Administration with a major in Finance.⁵

The proposed Ph.D. in Business Administration in the Belk College of Business at the University of North Carolina Charlotte is well-positioned to achieve an outstanding reputation. Over the past decade, the Belk College of Business has evolved into a research-oriented college. Every faculty member who has joined the College during that time has done so with a specific mandate to produce top-quality research. This has created a research culture within the College that is strong, and that will only increase with the addition of a doctoral program. The best evidence of this research culture has been the publications of the faculty and the ability of the College to attract faculty from some of the top universities in the nation.⁶

⁵ Letters of support for the proposed program from Charlotte area community leaders and institutions are provided in Appendix III.

⁶ For a list of current faculty who will likely participate in the program, see Appendix I.

The proposed Ph.D. program is well-positioned to attract excellent students. Perhaps the best evidence of this has been the overwhelming response to the newly introduced M.S. in Mathematical Finance. This program, which started in the fall 2003 semester, already has 14 enrolled students. The average GRE quantitative score for these students is 735, which corresponds to approximately the 90th percentile of all students. This demonstrates that the reputation of the Belk College of Business Administration in general and the Department of Finance and Business Law in particular is sufficiently strong to attract very high quality students.

The combination of the research reputation of the faculty of the Belk College and the demonstrated ability of the College to attract top students positions the College to quickly develop a significant reputation for its Ph.D. program. The structure of the proposed program is such that students will be expected to begin developing research agendas early in their studies, and it will encourage students to begin publishing prior to their graduation. This will allow students to more readily compete for academic positions at national and top regional schools.

2. List all other public and private institutions of higher education in North Carolina currently operating programs similar to the proposed new degree program.

Two universities in North Carolina offer a Ph.D. in Business Administration with a major in Finance (distance from Charlotte):

- (1) Duke University, The Fuqua School of Business (132 miles);
- (2) University of North Carolina at Chapel Hill, Kenan-Flager Business School (134 miles).

Each of the above Finance Ph.D. programs has had steady-state total enrollments of 15-20 students over the past five years. In addition, the Ph.D. in Economics at Duke offers a major in Financial Economics, and the Ph.D. in Economics at UNC Chapel Hill offers a major in Financial Econometrics.

Recently the Department of Economics at the University of North Carolina at Greensboro (83 miles from Charlotte) has proposed to establish a Ph.D. in Economics that will offer a minor in Financial Economics. This proposed UNC Greensboro Ph.D. in Economics will have virtually no overlap with the Ph.D. in Business Administration with a Finance major proposed here because the two programs have fundamentally different foci. The UNC Greensboro program is an applied degree: its primary goal is to train students in the application of existing economic theory and econometric methods to business problems. The proposed Ph.D. in Business Administration with Finance major is a research degree: its primary goal is to train students to conduct independent research in order to create new knowledge. Further, students in the UNC Greensboro program who take the Financial Economics field will primarily study economics with a few courses in Financial Economics, while students in the UNC Charlotte program will primarily study finance. This is more than a semantic difference, it is a major difference in the training the students will receive and in the types of positions that they can obtain.

Despite the presence of these programs, there is more than sufficient demand to justify another Ph.D. program in North Carolina, especially a program in business and finance in the Charlotte region.

3. Estimate the number of students that would be enrolled in the program during the first year of operation:

Full Time 4-5 Part Time 0

By admitting four-five students per year and assuming four years to complete the degree, at a steady state the program will probably have about 16-20 students at any one time. This is typical of other business Ph.D. programs in finance at other U.S. universities.

4. Estimate the current and projected demand for graduates of the proposed new degree program.

The past twenty years have witnessed a dramatic increase in the demand for finance doctorates.⁷ This demand has come from both academic and professional sources. As business schools have grown, the need for additional finance faculty has become more acute. As quantitative methods have come to dominate financial analysis, the investment banking and investment industry has realized that persons holding doctoral degrees with finance concentrations are particularly well trained in this area, and this has created a second major source of demand. These twin sources of demand have outstripped the capacity of business schools to produce Ph.D.s, which has resulted in a continuing shortage of doctoral-trained finance professionals. The following sections address these two areas of demand, and offer estimates of the number of finance Ph.D.s that the market will need in the future.

Academic Demand

Nationally the academic demand for finance Ph.D.s has been very strong, and, as discussed below, there is strong evidence that this demand will continue to grow. This demand has historically been caused by growth in faculty size of business school finance departments. Over the past two decades, the growth of MBA and undergraduate finance programs has created a need for a commensurate increase in finance faculty. A second source of demand is, however, rapidly developing. That second source of demand is replacements for retiring finance faculty. Because business schools are relatively recent additions to most universities, their faculties have not yet undergone large-scale retirements. It appears almost certain that in the next decade this will change. Thus, the demand for finance Ph.D.s will only increase. Further compounding the issue is that there has been a dramatic reduction in the production of Ph.D.s by business schools. The following sections address each of these issues.

⁷ In this context the phrases “finance doctorates,” “finance Ph.D.s,” and “Ph.D.s in Finance” refer to anyone holding a Ph.D. in Finance, a Ph.D. in Business Administration with a Finance major or its equivalent, such as a Ph.D. in Economics with a concentration in Financial Economics.

Demand and Growth in Business School Faculties

The growth in demand for business education has been dramatic, particularly at the MBA level. In the 1999-2000 academic year 257,709 B.B.A. degrees were awarded, which was over twenty percent of all bachelor's degrees conferred by U.S. universities. In that same year 112,258 MBA degrees were conferred, nearly one-quarter of the total master's degrees awarded by U.S. universities.⁸ Although these numbers are large, what is staggering is their growth, especially at the master's level. In 1970, U.S. universities conferred only 25,977 master's degrees in business.⁹ By 1980, that number had more than doubled to 57,391. By 1990, that number had risen to 78,255.¹⁰ From 1990 through 2000, the growth rate in MBA conferrals was 3.67 percent per year.¹¹

To serve this influx of students, business schools have had to increase class sizes and the size of their faculties. Even with the best efforts of business schools, however, this has been difficult. The Association to Advance Collegiate Schools of Business (AACSB), the primary accrediting body for business schools, notes that as of 1999 roughly five percent of all finance positions are currently unfilled, and that business schools expect a growth rate of approximately five percent in the number of finance positions.¹²

According to the National Center for Educational Statistics, as of 1998 there were approximately 4,970 faculty members who hold Ph.D.s in finance.¹³ Based on the conservative assumption that the growth rate in faculty will more closely mirror the growth rate in business school enrollments (3.67%) rather than the five percent rate observed by AACSB, by 2022 the number of finance faculty needed by business schools will be 10,219. If one were to assume only a two percent growth rate in faculty, a rate considerably lower than has happened historically, the number of finance faculty needed by 2022 will be 7,385. Growth in business school faculty, therefore, is likely to increase the demand for finance Ph.D.s by 2,500 to 5,000 people over current levels during the next twenty years.

Demand and Faculty Retirements

The growth in the demand for faculty in business schools has historically been almost entirely driven by growth in the schools themselves. However, business schools are now also experiencing a period of significant faculty retirements. As AACSB noted in 1998, faculty retirements are becoming more common as "...a cohort of faculty who started teaching in the 1950s and '60s approach retirement age."¹⁴ The scale of the retirement problem can be seen in data available through the National Center for Educational Statistics. The average age of the 4,970 faculty holding finance Ph.D.s identified by the 1998 "National Survey of Postsecondary Faculty" is 47.6 years, and the average date for the awarding of their doctoral degree was 1983. Assuming that the average faculty member will work until age 67, this implies that over the next

⁸ Source: Digest of Educational Statistics, 2001, U.S. Department of Education, 2001.

⁹ We note that in the early 1970s many of the master's degrees would have been M.S. or M.A. degrees in specific disciplines such as accounting or economics.

¹⁰ Source: Digest of Educational Statistics, 2001, U.S. Department of Education, 2001.

¹¹ While business schools continue to confer some M.A. and M.S. degrees, the overwhelming majority of the degrees conferred, and virtually all of the growth, has been in MBA degrees.

¹² Source: *AACSB Newslines*, Spring, 2000.

¹³ Source: National Center for Educational Statistics, *National Survey of Postsecondary Faculty 1998*.

¹⁴ *AACSB Newslines*, 1998.

twenty years universities will have to find replacements for roughly 2,485 finance faculty members. This will be in addition to the growth in faculty positions that will also occur. The AACSB notes that 30 percent of all business faculty members are over age 55. Assuming that this distribution holds for finance faculty as well, this implies that U.S. universities must create more than 1,490 new finance Ph.D.s in the next ten to twelve years to replace retiring faculty.¹⁵

Based upon the estimates of the growth in business school faculty size and of faculty retirements, it appears that U.S. universities must produce between 5,000 and 7,500 new Ph.D.s in finance over the next twenty years, just to satisfy the demand of academic institutions. This equates to between 250 and 375 finance Ph.D.s per year. This greatly exceeds the capacity of existing U.S. universities to meet the demand.

Ph.D. Production and the Current Shortage of Finance Ph.D.s

Over the past decade there has been a dramatic scaling back in the number of finance Ph.D.s created; e.g., the number of finance Ph.D.s conferred in 1998 was slightly more than 61 percent of the number conferred in 1994. There is little evidence that this trend is changing.

The primary reason for the reduction in Ph.D. production has been a redirection of resources to MBA programs caused by the tremendous influx of students to those programs. In fact, Zimmerman (2001) notes that top business schools have reduced the size of their doctoral programs by roughly 25 percent.¹⁶ For the four academic years 1997-1998 through 2000-2001, U.S. universities conferred a total of 299 Ph.D.s in finance, or an average of 75 new Ph.D.s per year. Clearly this rate of Ph.D. production will not meet the needs for future business schools faculty.

The low rate of Ph.D. conferrals creates immediate and long-term problems for business schools. Examining the current job market for finance academics clearly illustrates this. The job market for new finance Ph.D.s largely occurs at two academic meetings: the Financial Management Association meetings, held in October, and the American Finance Association meetings, held in early January. As a service to its members, the Financial Management Association (FMA) publishes position announcements from universities as well as resumes of job candidates. For 2002, the FMA Directory of Positions Available lists 185 academic positions. The FMA Resume Book lists 97 resumes.^{17/18} Thus, the current demand for finance Ph.D.s is roughly twice the current supply of finance Ph.D.s. This means that a significant number of positions will either go unfilled or will be filled by hiring faculty away from other institutions.

¹⁵ *Management Education at Risk*, Report of the Management Education Task Force to the AACSB Board of Directors, August 2002.

¹⁶ Zimmerman, J. L., *Can American Business Schools Survive?*, Working Paper FR 01-16, Bradley Policy Research Center, University of Rochester, September 2001.

¹⁷ We note that some of the resumes listed are for candidates that have graduated in the past, are currently working in the field, and are seeking to find another job. Thus, the shortage is more acute than it appears.

¹⁸ A current FMA list of open positions that require a Ph.D. in Finance or its equivalent is provided in Appendix II.

Private Sector Demand

The previous section noted that U.S. universities must produce between 5,000 and 7,500 finance Ph.D.s over the next twenty years to meet only the academic demands for faculty. In addition, the private and government sectors also demand finance Ph.D.s. Largely, commercial banks, investment banks, and government agencies drive this demand. Over the past twenty years the field of finance has undergone a major transformation—it has become increasingly quantitative and mathematically driven. These are areas where finance Ph.D.s tend to have very strong skills and, realizing this, the private sector has begun hiring significant numbers of finance Ph.D.s.

Estimating the private sector demand for finance Ph.D.s is difficult, as there is no central repository for data on private-sector hiring of Ph.D.s. What is well known, however, is that almost all investment banks, and most large commercial banks, routinely hire finance Ph.D.s into senior staff and managerial positions. Given the very important role that banking plays in the Charlotte and North Carolina community, this should create even stronger demand for finance Ph.D.s produced by the program proposed here.

One effect of the private sector's demand for finance Ph.D.s is that it further reduces the pool of available candidates for academic positions. AACSB, in its report "Management Education at Risk," notes that only 62 percent of U.S. business doctoral candidates plan to enter the academic labor market. While the AACSB statistic is for business doctoral students in general, there is reason to believe that more of the candidates within the subset of finance doctoral students will enter into industry (nonacademic) careers. The implication of this is that U.S. universities must produce between 8,000 and 12,000 finance Ph.D.s in order to fill the projected 5,000 to 7,500 faculty positions over the next twenty years.

Summary of Demand

The excess demand for finance Ph.D.s comes from two separate sources: the academic market and the private sector market. Growth in business school enrollments has created tremendous excess demand for new faculty at a time when the production of finance Ph.D.s has dropped dramatically. A significant portion of the current stock of finance faculty is nearing retirement and must be replaced. The private sector marketplace also hires a significant number of finance Ph.D.s.

The significance of this is that there is short-term excess demand for finance Ph.D.s and strong evidence for increased excess demand over time. Business schools have not increased the supply of finance Ph.D.s to meet current demand, and they have shown no signs of significantly increasing the production of Ph.D.s in the near future. Based on this analysis, it is anticipated that the demand for finance Ph.D.s from UNC Charlotte will be very high.

5. Plans to offer the program away from campus during the first year of operation:

There are no plans to offer the program away from campus.

6. Describe the procedures to be used to plan the proposed program.

The Dean of the Belk College of Business Administration appointed a Ph.D. Planning Committee with members representing all of the departments within the College to plan the program and prepare the appropriate documents. All members of the committee participated in the process. The members of the committee are as follows:

Steven H. Ott, Ph.D., Chair of the Ph.D. Planning Committee
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In preparing the program plan, the Committee consulted documentation from many programs throughout the nation. The institutions were selected to provide the Committee with information about program format, content, structure and governance structure for finance programs at a spectrum of both nationally recognized and regional universities. These institutions include:

- University of California – Berkeley
- University of California – Los Angeles
- University of Chicago
- University of Cincinnati
- Duke University
- University of Florida
- Florida State University
- University of Georgia
- Georgia State University
- University of Houston
- Indiana University
- MIT
- University of Memphis
- University of Michigan,
- New York University
- University of North Carolina–Chapel Hill
- Ohio State University
- University of Texas–Arlington
- University of Texas–Austin
- University of Texas–Dallas
- University of Virginia
- Virginia Tech
- University of Wisconsin–Madison
- Yale University

Program Structure and Governance

Based on the information provided by these other programs and also taking into account the unique needs of the proposed Ph.D. program in Business Administration at UNC Charlotte, the following describes a proposed governance structure and processes of the Ph.D. program in Business Administration; specifically, the roles and responsibilities for the following governing bodies are identified:

- The Graduate School and Dean of the Graduate School
- Dean of the Belk College of Business Administration
- The Business Administration Doctoral Faculty
- The Business Administration Doctoral Committee
- The Program Director

The Graduate School and Dean of the Graduate School

At the University of North Carolina at Charlotte, the Dean of the Graduate School is the administrative officer with primary responsibility for the supervision of graduate programs. The Dean is responsible for the executive and administrative affairs of the Graduate School in accordance with the policies determined by the UNC Charlotte Graduate Council, the Graduate Faculty and the Faculty Council. The Graduate School is responsible for monitoring the quality of graduate programs, the final admission of graduate students, appointments to the Graduate Faculty, and supporting the enhancement of research activities essential to the conduct of graduate programs. The Graduate Dean acts in cooperation with the Dean of the College of Business and the Program Director of the Ph.D. in Business Administration.

The Graduate Dean's main duties include the following:

- Collecting the material for applicants to the program
- Forwarding completed application packets to the Ph.D. Program Director
- Final admission of students
- Final appointment of dissertation and doctoral committees
- Approval of programs of study
- Admission of students to candidacy
- Final approval of dissertations

Dean of the Belk College of Business Administration

The ultimate responsibility for administration of the Ph.D. program at the College level will rest with the Dean of the Belk College of Business Administration. The Dean has administrative responsibility for the supervision of all departments in the College and acts in concert with the chair of each department and the Program Director on matters concerning programs and personnel.

The Business Administration Doctoral Faculty

The Business Administration Doctoral Faculty will be composed of those members of the Graduate Faculty at UNC Charlotte who will be expected to participate in the doctoral program as research dissertation advisors and instructors in component courses. It is expected that the credentials presented by a doctoral program graduate faculty member will include a list of journal publications, externally funded research grants and prior experience in supervising master's thesis and/or Ph.D. dissertations, as well as a research program relevant to the goals of the program. Appointment to the Business Administration Doctoral Faculty will be made by the Program Director and Business Administration Doctoral Committee. Appointments will be for five-year terms, with reappointment made according to the guidelines established by the Business Administration Doctoral Committee.

The Business Administration Doctoral Committee

There will be a Business Administration Doctoral Committee for each major that will consist of five members of the Business Administration Doctoral Faculty. They shall be elected by the Business Administration Doctoral Faculty. Each member will serve three-year renewable

terms. The Business Administration Doctoral Committee for the Major in Finance will consist of the chairperson from the Department of Finance and Business Law, one faculty member each from the Department of Mathematics and Department of Economics, and two other faculty members from the Department of Finance and Business Law.

The Business Administration Doctoral Committee is responsible for:

- Recommending to the Graduate School applicants for admission to the program
- Approving the student's advisory committee and dissertation topic
- Assuring that the qualifying exam is administered appropriately
- Recommending to the Graduate School qualified candidates for the degree
- Assuring, in conjunction with the Program Director, that all requirements are fulfilled by each candidate
- Recommending course additions and alterations as appropriate
- Approving participation of faculty in the program
- Planning and evaluating the program
- Approving minor areas of study
- Deciding on waivers of course requirements
- Evaluating applicants for admission to the program
- Recommending to the doctoral faculty changes in admission requirements, and degree requirements
- Recommending to the doctoral faculty changes in the governance of the Ph.D. program
- Recommending to the Ph.D. Program Director, candidates for teaching assistantships and tuition waivers

All policy decisions (e.g., course proposals, admission and degree requirements) will need to be approved by a majority vote of the Doctoral Faculty. Admission to a major program will likely be limited to three to five students each year. Such selectivity will allow each student to receive individual faculty attention.

All elections and decisions requiring approval of the Doctoral Faculty will need to have a quorum of two-thirds of the Doctoral Faculty members. Voting can be conducted either at a meeting or via an electronic mechanism. The Business Administration Doctoral Committee will propose any modifications, additions, and deletions to this governance document. A two-thirds majority vote of the Business Administration Doctoral Faculty, conducted in a manner described in this document, will be required for approval.

The Ph.D. Program Director

The detailed administration of the program will be the duty of the Program Director who reports to the Dean of the College of Business Administration. The Program Director will serve a three-year renewable term.

Duties of the Ph.D. Program Director include:

- Curriculum and conduct of the program
- Recommending operating budgets and supervising expenditures
- Chairing meetings of the Business Administration Doctoral Faculty
- Communicating assessment of the program and personnel to the chairs of participating departments and programs and the Deans of Business and Graduate School
- Overseeing recruitment efforts for the program
- Recommending budget allocations for travel, equipment, communication, and supplies
- Coordinating scheduling of courses among the cooperative departments and programs
- Assuring proper maintenance of graduate student records.
- Scheduling dissertation defenses
- Representing the program to external constituencies

It is anticipated that the Ph.D. Program Director will be supported by an administrative secretary and may receive one course release per semester.

Monitoring Program Performance

The Ph.D. program will be evaluated annually. The College of Business Administration's Executive Committee, consisting of the Dean and Department Chairpersons, has the primary responsibility for the annual review. The Program Director will report to the Executive Committee the metrics for monitoring program performance.

These metrics include:

- Number of students in the program
- Average time to graduation
- Data on placement of graduates
- Research productivity of students
- Number of students funded
- Number of classes offered
- Performance on written exams
- GMAT/GRE scores of admitted students
- Research productivity of doctoral faculty
- Amount of funded research
- Participation of doctoral faculty as measured by:
 - Ratio of faculty serving as dissertation chairs to dissertations
 - Ratio of faculty serving on dissertation committees to dissertations
 - Publications resulting from dissertations
- Recommendations for improvements by the Executive Committee should be made to the Doctoral Committee

7. Describe the method of financing the proposed new program and indicate the extent to which additional state funding may be required.

The program will require resources from both external and internal funds. UNC Charlotte's transition from a comprehensive institution to a Doctoral/Research University-Intensive institution will enable it to draw from expansion funds for partial support of the proposed program. Another source of partial funding is enrollment increase funding within the State appropriations. Additionally, UNC Charlotte's new status as a doctoral institution has attracted research-oriented faculty members and is leading to an increase in external research funds for support of graduate students. Internally, the University will provide support for administration of the program, graduate student support, and enhancement of library resources. Support from industry, state, and federal agencies, and UNC Charlotte's internal resources will be adequate for initiating and operating a highly respected Ph.D. program in Business Administration with a major in Finance.

Doctoral programs in business administration, unlike many of their counterparts in the Arts and Sciences, do not generate a large volume of funded research grants from federal government agencies such as the National Science Foundation. Instead, for doctoral programs in business administration, external funding most often comes from private business sources, in the form of gifts and private research projects, or endowments from alumni and other interested private donors.

Individuals and businesses, especially in the financial services sector, have been contacted, and preliminary indications are that there is significant support for a program of this type in the Charlotte region. The Charlotte Chamber of Commerce has endorsed doctoral programs at UNC Charlotte in its long-range plan for economic development in the city and region. The Ph.D. in Business Administration is viewed by the business community to be an integral part of graduate education in the region. Funding from business sources will fund graduate assistantships, fellowships, data sources, computer facilities, as well as other needed resources. In addition, there are a number of funding possibilities through other arrangements with businesses and state government agencies, such as research grants and internships.

It is anticipated that there will be significant sources of funding from external sources to support student fellowships, research, data acquisition, etc. Thus, the College is confident that a significant amount of private funding will be forthcoming for this doctoral program.

This request for authorization to plan a new program has been reviewed and approved by the appropriate campus committees and authorities.

Chancellor  _____

7. Describe the method of financing the proposed new program and indicate the extent to which additional state funding may be required.

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This request for authorization to plan a new program has been reviewed and approved by the appropriate campus committees and authorities.

Chancellor _____

Appendix I: Faculty Participation in the Ph.D. Program in Finance

The Finance and Economics faculty within the Belk College of Business Administration at UNC Charlotte and the Department of Mathematics are composed of individuals with diverse areas of interest and many have established national reputations in research and teaching. Members of the faculty produce high-quality research papers, articles and books on a wide variety of topics in mathematical finance, finance, economics, insurance and real estate. The results of many of these studies are published in top academic journals and members of the faculty are regularly invited to present their research findings to businesses and governmental agencies, as well as other academic institutions. It is also likely that faculty from the Department of Business Information Systems and Operations Management will participate in the program by working with Ph.D. students who pursue research in the areas of advanced statistical methodologies and optimization methods.

Commitment of the faculty to the program is evidenced by the past cooperation with other existing joint programs, e.g., the Departments of Finance and Economics in the College are jointly operating a master's program in Mathematical Finance with the Department of Mathematics. The Department of Business Information Systems and Operations Management works with the College of Information Technology, in offering a Ph.D. in Information Technology. In addition, the Department of Economics currently teaches two core courses for the Ph.D. program in Public Policy. In addition, an ad hoc committee to prepare this document is composed of faculty from all departments within the Belk College of Business and from the Department of Mathematics.

There are a number of faculty in each department with the qualifications, experience and desire to be involved in this program. These faculty are listed below:

Finance:

<u>Name</u>	<u>Rank</u>	<u>Research Interests</u>
Ben Nunnally	Professor	Corporate Finance, Financial Markets, Capital Investments
Steven Ott	Professor	Derivatives, Financial Markets, Real Estate Finance
C. William Sealey	Professor	Banking, Derivatives, Financial Institutions
Lloyd Blenman	Associate Professor	Finance Theory, Derivatives, International Finance
Richard Buttimer	Associate Professor	Derivatives, Real Estate Finance, Fixed Income Finance
Steven Clark	Assistant Professor	Mathematical Finance, Derivatives, Corporate Finance

Economics:

<u>Name</u>	<u>Rank</u>	<u>Research Interests</u>
Ted Amato	Professor	Industrial Organization, Econometrics
John Gandar	Professor	Financial and Sports Economics, Microeconomics
Rick Zuber	Professor	Financial Economics, Sports Economics
Hwan Lin	Associate Professor	Economic Growth, Public Finance, Microeconomics
Rob Roy McGregor	Associate Professor	Monetary Economics, Econometrics, Macroeconomics
Ben Russo	Associate Professor	Public Policy, Economic Growth, Macroeconomics
Jennifer Troyer	Assistant Professor	Health Economics, Econometrics, Labor Economics
Stanislav Radchenko	Assistant Professor	Time Series, Bayesian Econometrics, Industrial Organization

Business Information Systems and Operations Management:

<u>Name</u>	<u>Rank</u>	<u>Research Interests</u>
Frank Barnes	Professor	Industrial and Systems Engineering
Doug Cooper	Professor	Mathematical Programming
Cem Saydem	Professor	Applied Mathematical Programming
Moutaz Khouja	Professor	Service Management and Operations and Statistics
Ram Kumar	Associate Professor	Value of Information Systems
Antonis Stylianou	Associate Professor	E-Commerce
Subramaniam Chandrasekar	Assistant Professor	Information Technology
Sungjune Park	Assistant Professor	Neural Network Applications

Mathematics:

<u>Name</u>	<u>Rank</u>	<u>Research Interests</u>
You Lan Zhu	Professor	Derivatives, Computation, and Option Pricing
Joseph Quinn	Professor	Probability and Stochastics
Isaac Sonin	Professor	Probability and Stochastics
Volker Wihstutz	Professor	Probability and Stochastics
Alexander Yushkevich	Professor	Probability and Stochastics
Robert Anderson	Associate Professor	Probability and Stochastics
Zhi Yi Zhang	Associate Professor	Statistics
Janusz Kawczak	Assistant Professor	Probability and Statistics

Appendix II: Financial Management Association: Current Open Positions¹⁹

Financial Management Association: Current Open Positions

University of Hartford, West Hartford, Connecticut
Stonehill College, North Easton, Massachusetts
University of Maryland, College Park, Maryland
St. Cloud State University, St. Cloud, Minnesota
Idaho State University, Pocatello, Idaho
University of North Florida, Jacksonville, Florida
Iona College, New Rochelle, New York
Roosevelt University, Chicago, Illinois
West Chester University of Pennsylvania, West Chester, Pennsylvania
Baruch College, New York, New York
Rensselaer Polytechnic Institute, Troy, New York
University of Massachusetts - Dartmouth, North Dartmouth, Massachusetts
George Mason University, Fairfax, Virginia
Northwestern College, Orange City, Iowa
Plattsburgh State University of New York, Plattsburg, New York
St. John's University, Jamaica, New York
Cornell University, Johnson School, Ithaca, New York
State University of New York at Buffalo, Buffalo, New York
Penn State Capital College, Middletown, Pennsylvania
Rollins College, Winter Park (Orlando), Florida
Coastal Carolina University, Conway, South Carolina
Barclays Global Investors, San Francisco, California
State University of New York - Binghamton, Binghamton, New York
University of Minnesota Duluth (UMD), Duluth, Minnesota
University of Nevada - Reno, Reno, Nevada
Harvard Business School, Boston, Massachusetts
San Diego State University - Imperial Valley Campus, Calexico, California
Prairie View A&M University, Prairie View, Texas
Mellon Capital Management, San Francisco, California
Metropolitan College of New York, New York, New York
Instituto Tecnológico Autónomo de México, Mexico City, Mexico
Indiana University South Bend, South Bend, Indiana
Southeastern Louisiana University, Hammond, Louisiana
Augusta State University, August, Georgia

¹⁹ These positions require a Ph.D. in Business Administration with a major in Finance or its equivalent

Financial Management Association: Current Open Positions

University of Massachusetts Lowell, Lowell, Massachusetts
Alcorn State University, Natchez, Mississippi
University of Texas at El Paso, El Paso, Texas
Moody's KMV, San Francisco and New York
University of Missouri - St. Louis, St. Louis, Missouri
Florida International University, Miami, Florida
Georgia State University, Atlanta, Georgia
Northern Kentucky University, Highland Heights, Kentucky
Cleveland State University, Cleveland, Ohio
University of Texas of the Permian Basin, Odessa, Texas
Brock University, St. Catharine's, Ontario, Canada
University of North Carolina at Wilmington, Wilmington, North Carolina
East Carolina University, Greenville, North Carolina
University of San Diego, San Diego, California
University of Mississippi, Oxford, Mississippi
George Washington University, Washington, D.C.
Florida State University, Tallahassee, Florida
World Wildlife Fund, Washington, D.C.
Johns Hopkins Business, Baltimore, Maryland
University of Delaware, Newark, Delaware
Florida State University, Tallahassee, Florida
Arizona State University, Tempe, Arizona
Samsung Research Institute of Finance, Seoul, Korea
University of Lethbridge, Lethbridge, Alberta, Canada
University of Kansas, Lawrence, Kansas
Oklahoma State University, Stillwater, Oklahoma
University of Massachusetts Boston, Boston, Massachusetts
Southeast Missouri State University, Cape Girardeau, Missouri
University of Regina, Regina, Canada
McMaster University, Hamilton, Ontario
Massey University, Auckland, New Zealand
St. Edward's University, Austin, Texas
Quinnipiac University, Hamden, Connecticut
Salisbury University, Salisbury, Maryland
Pennsylvania State University, University Park, Pennsylvania
Central Connecticut State University, New Britain, Connecticut
Babson College, Babson Park, Massachusetts
Purdue University, West Lafayette, Indiana
University of Manitoba, Winnipeg, Manitoba, Canada
University of Texas at San Antonio, San Antonio, Texas

Financial Management Association: Current Open Positions

Texas State University-San Marcos, San Marcos, Texas
Appalachian State University, Boone, North Carolina
University of North Carolina, Chapel Hill, North Carolina
Queen's School of Business, Ontario, Canada
Barra, Inc., Berkeley, California
Kansas State University, Manhattan, Kansas
University of Redlands, Redlands, California
Fannie Mae, Washington, D.C.
Drexel University, Philadelphia, Pennsylvania
Northeastern University, Boston, Massachusetts
Ohio University, Athens, Ohio
DePaul University, Chicago, Illinois
Korea Institute of Finance, Seoul, Republic of Korea
University of Technology, Australia
University of Missouri-Kansas City, Kansas City, Missouri
University of Houston, Bauer College of Business, Houston, Texas
Elizabethtown College, Elizabethtown, Pennsylvania
University of Georgia, Athens, Georgia
Loyola College in Maryland, Baltimore, Maryland
Seattle University, Seattle, Washington
San Diego State University, San Diego, California
Indian School of Business, Hyderabad, India
College of Charleston, Charleston, South Carolina
Grand Valley State University, Grand Rapids, Michigan
Providence University, Taichung, Taiwan
Butler University, Indianapolis, Indiana
University of Wisconsin-Whitewater, Whitewater, Wisconsin
Wichita State University, Wichita, Kansas
University of Wisconsin-Parkside, Kenosha, Wisconsin
North Georgia College and State University, Dahlonega, Georgia
Louisiana State University, Baton Rouge, Louisiana
Indiana University Southeast, New Albany, Indiana
Berry College, Mount Berry, Georgia
University of Virginia, Charlottesville, Virginia
Pepperdine University, Culver City, California
University of Southern Indiana, Evansville, Indiana
The American College, Bryn Mawr, Pennsylvania
Illinois State University, Normal, Illinois
Washington State University, Pullman, Washington
Dowling College, Oakdale, New York

Financial Management Association: Current Open Positions

West Virginia University, Morgantown, West Virginia
Temple University, Philadelphia, Pennsylvania
University of Montenegro, Podgorica, Serbia-Montenegro
California State University - Stanislaus, Turlock, California
Seton Hall University, South Orange, New Jersey
Rensselaer, Troy, New York
University of Texas - Austin, Austin, Texas
Shippensburg University, Shippensburg, Pennsylvania
San Francisco State University, San Francisco, California
Saint Louis University, St. Louis, Missouri
Memorial University of Newfoundland, Newfoundland, Canada
Kent State University, Kent, Ohio
Indiana University, Bloomington, Indiana
Board of Governors of the Federal Reserve System, Washington, D.C.
Kennesaw State University, Kennesaw, Georgia
Chapman University, Orange, California
University of Iowa, Iowa City, Iowa
University of Miami, Coral Gables, Florida
Singapore Management University, Singapore
Southwest Missouri State University, Springfield, Missouri
Indiana-Purdue University, Fort Wayne, Indiana
Pace University, New York, New York
University of Missouri-Columbia, Columbia, Missouri
University of West Florida, Pensacola, Florida
Rutgers University, Camden, New Jersey
California State University - Sacramento, Sacramento, California
University of Michigan-Dearborn, Dearborn, Michigan
Xavier University, Cincinnati, Ohio
Fordham University, New York, New York
University of Virginia, Darden School, Charlottesville, Virginia
Massey University, Auckland, New Zealand
Wells Fargo Home Mortgage, Clayton, Missouri
Oregon State University, Corvallis, Oregon
Old Dominion University, Norfolk, Virginia
The Hong Kong University of Science and Technology, Kowloon, Hong Kong
Illinois Wesleyan University, Bloomington, Indiana
Saint Vincent College, Latrobe, Pennsylvania
York University, Schulich School of Business, Toronto, Ontario, Canada
Louisiana Tech University, Ruston, Louisiana
California State University - San Bernardino, San Bernardino, California

Financial Management Association: Current Open Positions

University of Dayton, Dayton, Ohio
St. Bonaventure University, St. Bonaventure, New York
Texas Tech University, Lubbock, Texas
The University of New South Wales, Sydney, Australia
Federal Reserve Bank of St. Louis, St. Louis, Missouri
University of Texas at Arlington, Arlington, Texas
University of Texas-Pan American, Edinburg, Texas
U.S. Securities and Exchange Commission, Washington, D.C.
University of Wisconsin-Milwaukee, Milwaukee, Wisconsin
Wright State University, Dayton, Ohio
University of Wyoming, Laramie, Wyoming
Virginia Tech, Blacksburg, Virginia
Florida Atlantic University, Boca Raton, Florida
James Madison University, Harrisonburg, Virginia
Southern Illinois University Carbondale, Carbondale, Illinois
Bradley University, Peoria, Illinois
University of Alabama, Tuscaloosa, Alabama
Long Island University/C.W. Post Campus, Brookville, New York
Baruch College/CUNY, New York, New York
Suffolk University, Boston, Massachusetts
Wake Forest University, Winston-Salem, North Carolina
Marshall University, Huntington, West Virginia
New York University, New York, New York
Miami University, Oxford, Ohio
Clarkson University, Potsdam, New York
Office of the Comptroller of the Currency, Washington, D.C.
National Dong Hwa University, Taiwan
United States Postal Service, Washington, D.C.
University of Maryland, College Park, Maryland

Appendix III: Letters of Program Support

David L. Hauser

Senior Vice President and Treasurer
Duke Energy Corporation

David L. Hauser is senior vice president and treasurer of Duke Energy Corporation. He has key responsibility for the corporate finance, business unit finance, insurance and long-term investment departments for Duke Energy. A native of High Point, Mr. Hauser earned his undergraduate degree in business from Furman University and his Master of Business Administration from the University of North Carolina at Charlotte. He joined Duke Power in 1973 and worked his way up through the accounting area of the company — being named controller of Duke Power in 1987. In 1994, he was named vice president of procurement services and materials —overseeing all facets of commodity acquisition and warehousing, construction and maintenance of commercial facilities and fleet management. He was named chairman of global asset development in 1997.



Duke Energy Corporation
526 South Church St.
Charlotte, NC 28202-1802

Mailing Address
P. O. Box 1006
Charlotte, NC 28201-1006

April 12, 2004

Dr. C. W. Sealey
Head, Department of Finance and Business Law, and
The Torrence E. Hemby Distinguished Professor in Banking
Belk College of Business Administration
The University of North Carolina at Charlotte
9201 University City Boulevard
Charlotte, NC 28223-0001

Dear Dr. Sealey,

I think it is wonderful that UNC-Charlotte is considering offering a Ph.D program in Business Administration with a specialization in Finance. Finance is becoming an increasingly complex field and the Charlotte area is clearly a center for Finance. Having graduates of UNC-Charlotte that have a Ph.D in Finance will be of significant value to corporations in the area.

Please let me know if there is anything I can do to help you be successful in offering this degree.

Sincerely,

A handwritten signature in cursive script that reads 'David L. Hauser'.

David L. Hauser

DLH/rs



April 30, 2004

WACHOVIA

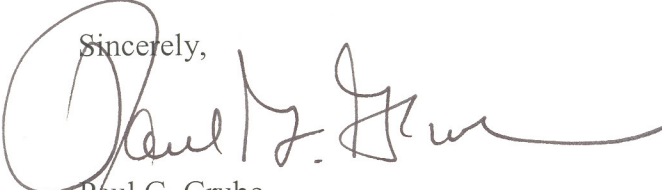
Dr. Claude C. Lilly, III
Dean
Belk College of Business Administration
UNC Charlotte
9201 University City Boulevard
Charlotte, NC 28223-0001

Dear Dean Lilly:

It gives me great pleasure to write in support of your proposed new program at UNC-Charlotte. Specifically, a Ph.D. in Business Administration with a concentration in Finance. Financial services in the United States, and especially Charlotte, have been growing at a rapid pace over the last two decades. Financial services now play an important role in all advanced economies. This is especially true in the Charlotte region. Concurrent with this growth has been a rapid increase in the sophistication and complexity of the financial services field. These factors have lead to a strong demand for highly trained professionals in the finance field at the doctoral level. Regrettably, the Charlotte region has not kept pace with doctoral educational opportunities in finance. A Ph.D. program with a concentration in Finance at UNC-Charlotte would represent an important step in correcting this problem.

Please let me know if I can be of further assistance.

Sincerely,



Paul G. Grube

