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FACTORS ACCOUNTING FOR VARIATIONS IN LEVELS OF PRIVATE GIVING TO HIGHER EDUCATION IN THE UNITED STATES

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FACTORS ACCOUNTING FOR VARIATIONS IN LEVELS OF PRIVATE GIVING TO HIGHER EDUCATION IN THE UNITED STATES

by

Sally Spaid Drachman

A Dissertation Submitted to the Faculty of the CENTER FOR THE STUDY OF HIGHER EDUCATION In Partial Fulfillment of the Requirements For the Degree of DOCTOR OF PHILOSOPHY With a Major in Higher Education In the Graduate College THE UNIVERSITY OF ARIZONA

1983
As members of the Final Examination Committee, we certify that we have read the dissertation prepared by Sally Spaid Drachman entitled Factors Accounting for Variations in Levels of Private Giving to Higher Education in the United States and recommend that it be accepted as fulfilling the dissertation requirement for the Degree of Doctor of Philosophy.

Final approval and acceptance of this dissertation is contingent upon the candidate's submission of the final copy of the dissertation to the Graduate College.

I hereby certify that I have read this dissertation prepared under my direction and recommend that it be accepted as fulfilling the dissertation requirement.

Dissertation Director

Date
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SIGNED: Sally S. Drachman
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The purpose of this study was to identify factors accounting for variations in levels of private giving to United States higher education. A second objective was to quantify the effect of each variable on voluntary contributions. Two separate analyses were performed.

A cross-sectional study was designed to determine why amounts given vary among institutions for the year 1977-78. Four models were created: an overall contributions and per alumnus contributions model, an economic resource model and an eclectic model. All were analyzed using ordinary least squares regression.

The dependent variable used was private giving and the independent variables examined were related to the institution itself or the state environment. In the analysis Liberal Arts I institutions were separated from Research Universities I and tests were performed that divided the sample into public/private institutions, wealthy/poor regions, and sunbelt/snowbelt regions.

Second, a time-series analysis of total giving to higher education institutions was performed encompassing the years 1932 to 1974. Again, ordinary least squares regression was used. The dependent variable was total giving (TG) to higher
education and the primary independent variables were largely economic factors. In the time-series analysis, three models were probed: gross receipts, net receipts, and a national income model.

The cross-sectional analysis found that RUI and LAI institutions share one major variable that is strongly associated with contributions to them: quality. Other factors were found to vary among regions and between nonalumni and alumni giving. It was found also that private giving is best explained through alumni.

The time-series analyses had very high explanatory power. Division of the gross receipts model revealed a decided difference between individual and business giving with business responding in classical economic fashion and individuals contributing in apparent disregard of economic motives. It would appear that different characteristics should be stressed when dealing with the different donors to institutions of higher education. Alumni and nonalumni should be solicited in disparate manners and businesses and individuals should be pursued for gifts at different times with different strategies, according to economic indicators and the demonstrated needs of the college.
CHAPTER 1

THE PROBLEM AND ITS CONTEXT

Income from private sources has always been crucial to American higher education. Of no small significance is the fact that two of the first universities in the colonies, Harvard and Yale, were named not for their founders, but for their first major benefactors. Three hundred years later, America's colleges and universities are no less indebted to generous contributors. In 1979-80, voluntary support to higher education increased by 17.6 percent over the previous year, to total $3.8 billion (Council for Financial Aid to Education 1979-80). Regardless of this spirit of private philanthropy that has historically been exhibited by Americans, higher education faces a new challenge in the 1980's. Recent relative declines in overall resources have created a more pressing aspect--a timeliness--to the significance of voluntary support.

Background

Although the Constitution of the United States of America places no responsibility on the federal government for the education of its populace, education in the colonies
and states has always been viewed as being in the public interest. Consequently, it is also seen as a public responsibility; however, the idea of a public responsibility does not indicate that it is exclusively a responsibility of government. The public responsibility for higher education in America was expressed in early public policies that exempted colleges and universities from taxation because their purposes were highly valued and their contributions to the public good were held in high esteem. Also, private gifts to higher education were, as they are today, tax deductible.

Early on, the responsibility for higher education in the United States was conducted primarily by the state and local governments, a departure from the custom in most other countries where higher education was heavily supported and often controlled by national governments. In the United States, the states, or sometimes local governments, have chartered and sustained colleges and universities, but in relative terms they have been less involved in internal college governance or operations.

Attention must be given to four historic traditions which have evolved and impacted on higher education in relation to the federal government. First, many of our colleges and universities were founded by religious organizations to educate men for the ministry. After 1819 a definite chasm separated church and state, creating
a vast legal barrier between the institutions and the government. Second, because of the commercial complexion of society in America, higher education is seen in part as a purchasable commodity, as opposed to a benefit to be bestowed by society through its government—a view in which the theory of low or no tuition is solidly based. Third, Americans tend to rely on private giving to support public needs; and, last, the emphasis of Americans on individual initiative and enterprise has limited government to being a regulator as opposed to an executor of the public interest (Rowland 1977, p. 3).

One of the results of this unusual pattern of American higher education, a pattern which has witnessed so little government control, is a high degree of competitiveness among colleges and universities. Even government-sponsored military academies compete with other institutions in the market place for monies and students. This competition for resources, where no effective national policy governs acquisition of funds, often means that individual institutions, and not the government, are responsible for their own financial success.

Although not responsible for financial success of higher education, government at all levels has been a key resource-provider to education. In the last decade, however, revenues from both federal and state sources have constituted a smaller proportion of total funds for colleges
and universities, even though absolute dollar amounts have grown larger (National Center for Educational Statistics 1978, p. 94). Health, social, and administrative services are receiving greater priority by government agencies and legislatures than is higher education. With the growing competition for tax dollars by an increasing number of higher education institutions, major increases in public funding to colleges and universities should not be expected (Kerr 1980).

In addition to closing the void in resources created by government budget cuts, voluntary support and endowment are usually the only monies an institution has that do not come with obligatory controls. The spending of governmental appropriations and allocations and the income from other sources are usually either prescribed or closely regulated. All institutions find it necessary to impose self-constraints on spending, as day-to-day responsibilities quickly consume income that was once partially discretionary.

Discretionary resources, generally dependent on endowment and related funds, are indispensable to the vitality and autonomy of institutions. They allow an institution to establish additional programs, reward faculty, or move in new directions without restrictions or obligations. They create a higher education scene in America that reflects diversity, rather than a sameness and lethargy that can result from heavy regulation on spending. Much dis-
cretionary spending now relies almost solely on voluntary support; further, more and more frequently, voluntary support is needed to balance institutional budgets.

The recent proportional decline in resources to higher education makes growth in voluntary support a critical requirement. Statistics show, however, that over the years, voluntary support in terms of shares of institutional expenditures and adjusted (for inflation) dollars per student has been unstable, even though in absolute amounts voluntary support has increased annually. From 1949-50 to 1965-66, contributions per student grew from $125 to $251, while the share of institutional expenditures accounted for by voluntary support remained at about 9.5 percent. Sharp declines occurred in 1970-71, during the 1973-74 recession, and again in 1975-76. In that last year, giving represented only 5.6 percent of institutional expenditures or about $135 (adjusted) dollars per student. Since that time the figures have fluctuated until the 1979-80 total represented a 6.4 percent share of institutional expenditures and an adjusted $140 per student (Council for Financial Aid to Education 1979-80).

In 1980, Americans contributed a total of $47.7 billion to all charitable organizations in the United States. This amounted to an average of $215 on a per capita basis. The total private giving was about seven percent of our national budget. During the past decade, personal giving
has declined as a proportion of personal income (by 9%) and gross national product (by 14%) (Bakal 1981, p. 207). Sources of charity and the amounts contributed in Giving USA 1980 Annual Report as reported by the American Association of Fund Raising Counsel, Inc. (p. 6) are as follows: individuals, $39.9 billion (83.7 percent); individual bequests, $2.9 billion (6.0 percent); and corporations, $2.6 billion (5.3 percent); and foundations, $2.4 billion (5.0 percent). These percentages were computed from 1980 data.

Individuals traditionally account for about 90 percent of private giving. Of the $47.7 billion donated to charity during 1980, religion and churches claimed $22.1 billion or 46 percent of the total while education, higher and secondary, was second with $6.7 billion or 14 percent of the total (Bakal 1981, p. 213).

Total corporate contributions for educational and charitable purposes in 1980 were estimated by the Council for Financial Aid to Education at $27 billion or 1.1 percent of net income before taxes. Brian O'Connell, the President of Independent Sector, which represents many charitable and nonprofit institutions, stated "As significant as corporation giving has become, it is still only 5 percent of the annual total gifts to charity" (Thornton, 1982). Only 35 percent of the United States firms give anything at all (American Association of Fund
Private gifts, grants, and contracts provide revenues to higher education institutions from these private sources. The proportion of these revenues of all revenues in 1979 for private institutions was 14 percent compared to the 3 percent for public institutions (Minter 1979, p. 21).

An issue that may affect voluntary support in a major way has to do with changes in tax law. Aside from humanitarian and moral aspects, tax benefits appear to have assumed increasing importance. This is due in large part to the highly graduated tax systems that apply to individuals. For many individuals, income taxes constitutes the largest single item in their budgets (Desmond 1967).

Income received by charitable institutions has been exempt from taxation by national income tax laws in the United States since 1913. Further, individual income tax basically allows a taxpayer who itemizes personal deductions to take a deduction for gifts to public charities. There is a tax deduction limit overall in any one year to a deduction equal to 50 percent of adjusted gross income. Deductions are further limited to thirty per cent of adjusted gross income for gifts of property whose market value has increased over its value at the time of acquisition by the taxpayer and which would produce capital gains income if sold (appreciated property). (The National Association of Independent Colleges and Universities 1978, p. 2).
Under the 1969 Tax Reform Act, those who took the standard deduction were allowed to deduct a flat dollar amount. In 1970, 50 percent of all taxpayers itemized their deductions, and taxpayers who used the standard deduction could not take the charitable deduction, resulting in less incentive to make charitable contributions.

Changes in tax regulations in 1981 have resulted in a further decline in the percentage of persons who itemize deductions, and thus the incentive of the charitable deduction has been even more significantly narrowed. Today, almost 77 percent of all taxpayers effect the standard deduction, compared to 52 percent in 1970. The gradual narrowing of the availability of the charitable deduction to taxpayers has had a serious impact on the flow of funds to charities (National Association of Independent Colleges and Universities 1978).

Clearly, a sound understanding of all the factors accounting for variations in levels of voluntary support, as well as maintaining and expanding these resources in the next decade, is essential for decision makers, educator-leaders, and those interested in the financial health of higher education.

**Purpose Statement**

The purpose of this study was to identify the factors that account for variations in levels of voluntary
support to United States colleges and universities and to specify the relative importance of each factor.

Nature of the Study

This study incorporated two methods of research. The first was a cross-sectional study of colleges and universities in the single year 1977-78. The other was a time-series analysis of aggregated levels of private giving to universities in the years 1932-1974.

Significance

Although, in recent years, voluntary support to higher education in the United States has grown, it has not kept up with inflation; thus as a share of total revenues, voluntary support has declined. Now, more than ever, voluntary support must be encouraged. Many cuts in education support are on the floor of the Congress. Student aid already has been cut. These eventualities make voluntary support more important than ever.

For those in the institutional decision-making process, a university president or development officer for example, it is imperative that answers be available as to how institutional ability to increase levels of private support may be enhanced. Those decision-makers must be able to determine which, and to what extent, varying factors impact on voluntary support. For example, if only economic motives explain private giving, then amounts contributed
would flow in a direct relationship to such indicators as the Consumer Price Index, the Gross National Product, and Standard and Poor's various Indexes. Further, if itemized tax incentives are important, then the development department could work (lobby) for changes in tax laws. And, whatever factors are most important to alumni, when identified, can guide an institution on the traits upon which to put its emphasis.

It is hoped that any factors identified by this study as affecting giving to higher education can be utilized by development people, in one manner or another, to help procure funds for their institutions. By identifying the relative importance of the factors, institutions may be able to derive more funds by giving the appropriate emphasis to each factor.

Previous related studies limit their findings to specific areas, such as corporate or foundation support. No other study has covered the spectrum of forms of support, nor has the relative importance of each factor been examined.

The Research Questions

The following questions pertain to the factors that account for variations in levels of voluntary support in 1977-78 among United States institutions of higher education.

1. To what extent do variations in certain institutional characteristics, such as age, size, religious affili-
1. To what extent do variations in levels of voluntary support account for variations in levels of voluntary support?

2. To what extent do variations in certain levels of state appropriations account for variations in levels of voluntary support?

3. To what extent do variations in certain alumni characteristics account for variations in levels of voluntary support?

4. To what extent do variations in state wealth measures (for states in which institutions are located) account for variations in levels of voluntary support?

The following questions pertain to the factors which account for variations in the level of voluntary support for higher education in the United States in the years 1932-1974.

1. To what extent do variations in the stock market prices account for variations in voluntary support?

2. To what extent do variations in total national output account for variations in voluntary support?

3. To what extent do variations in inflation account for variations in voluntary support?

4. To what extent do variations in personal income account for variations in voluntary support?

5. To what extent do variations in tax regulations account for variations in voluntary support?
Definition of Terms: General

Voluntary support is defined in Gift Reporting Standards (Council for Financial Aid to Education 1978-79) as the amount of money given to higher education by individuals, foundations, business corporations, religious denominations, and other sources. Excluded are earnings from endowment and other invested funds and support received from federal, state, and local governments and their agencies.

C.F.A.E. is the Council for Financial Aid to Education.

Private gifts, grants, and contracts are all revenues from nongovernmental organizations or individuals, including monies resulting from the purchase of goods or services by nongovernmental entities on a contractual basis. Unrestricted gifts, grants, and bequests, as well as restricted gifts and grants to the extent that they are expended for current operations (including scholarships and fellowships) are included in this category. Income from funds held in revocable trusts or distributable at the discretion of the trustees of such trusts are included. Monies received as a result of gifts, grants, or contracts from a foreign government also should be included.

The endowment fund is a fund whose principal is not expendable and which is intended to be invested in order to produce income.

Research Universities I (RUI) (classified by the Carnegie Council on Policy Studies in Higher Education
1976) the 51 leading universities in terms of financial support of academic science in at least two of the three academic years, 1972-73, 1973-74, and 1974-75, provided they awarded at least 50 Ph.D's (plus M.D.'s if a medical school was on the same campus) in 1973-74.

**Liberal Arts Colleges I (LAI)** (classified by the Carnegie Council on Policy Studies in Higher Education 1976) are the most selective liberal arts colleges, as measured by a selectivity index or those included among the 200 leading baccalaureate-granting institutions in terms of their graduates receiving Ph. D's at 40 leading doctorate-granting institutions from 1920-1966.

**Comprehensive Universities and Colleges II**

This list includes state colleges and private colleges that offered a liberal arts program and at least one professional or occupational program. Many of the institutions in this group are former teacher colleges that have broadened their programs to include a liberal arts curriculum. In general, private institutions with less than 1,500 students and public institutions with less than 1,000 students in 1976 were not included even though they offered a selection of programs because they were not regarded as comprehensive with such small enrollments.

**Liberal Arts Colleges II**

These institutions include all the liberal arts colleges that did not meet the criteria for inclusion in
LAI. Again, the distinction between "liberal arts" and "comprehensive" was not clear-cut for some of the larger colleges in this group and was necessarily partly a matter of judgment.

**Economic Terms**

_Chandy theory_ is a recent addition to the Theory of Exchange. Charity Theory is based upon the utilities to donors of the gifts given to others.

_The Consumer Price Index (CPI)_ is a measure (index) of the average price of consumer goods and services relative to their price in some base year.

_A Free-rider_ is an individual who reaps direct benefits from someone else's purchase (consumption) of a public good.

_The Gross National Product (GNP)_ is the total market value of all final goods and services produced in a given time period.

_The Incentive effect_ is the responsiveness of the level of private giving to the deductibility of gifts.

_Income elasticity of giving_ is the percentage change in giving in relation to the percentage changes in income.

_Price elasticity of giving_ is the percentage change in giving in relation to the percentage change in the "price" of giving.

_Price elasticity of demand_ is the percentage change in quantity of goods and services in relation to the percentage
change in price.

The real GNP is the value of final output produced in a given period measured in the prices of another period (constant prices).

The theory of exchange is a two-person, two-good condition in which each party benefits from the mutual exchange of tangible goods.

The true price of giving or net price is the price of giving based on after tax considerations.

Utility is the pleasure or satisfaction obtained from a good or service.

Utility interdependence related to multiple sources of satisfaction and how they interrelate.

Assumptions
1. Voluntary support totals are reported accurately and consistently over time in the sources utilized.
2. The independent variable data are accurate.
3. The Gourman Report, attempting to place a measure on the quality of institutions, is relatively accurate in reflecting public impressions of quality.

Limitations of the Study
1. Not all variables that account for variations in private giving are included in this study. Variables selected are those that are readily available for all or most institutions.
2. Regression analysis only shows associations and
relationships. Cause should not be inferred.

3. A problem of co-linearity in regression exists. Where there are several independent variables affecting the dependent variable (voluntary support) and those independent variables are interrelated, it is extremely difficult to separate the co-variation. Co-variation is the effect that two independent variables share together.

4. The inferences are limited because only two types of institutions are examined: Research Universities I and Liberal Arts Colleges I.

5. This study is confined by those statistical limitations usually found when generalizing from a sample to its population.

6. This study is limited to the chosen variables.
CHAPTER 2

REVIEW OF THE LITERATURE

This chapter begins with an early history of private support to higher education. This early history covers the support of Harvard University and the colonial American colleges and the support of colleges during the expansion westward. Section two presents motivation-for-giving studies. The third section thoroughly discusses a particularly relevant study that examines factors accounting for fund-raising effectiveness by higher education institutions. Finally, a conceptual framework is offered as a way to view voluntary support of higher education.

Early History of Private Support to Higher Education

The American philanthropical spirit evolved from the attitude of the first settlers from England. Upon their arrival, they, along with the Dutch settlers, continued the pattern of charitable giving that had been established in their homeland (Broce 1971, p. 10). In fact, the European settlers tried to approximate entirely the culture they had known and enjoyed back home (Brubacher 1958); therefore, it is not surprising that many aspects of the early colonial colleges followed the patterns of colleges in England and of their earlier continental counterparts. In the medieval
world, some of the first endowments and fellowships for colleges were established to recruit leaders for the church; in like manner, the origins of the new colleges in the colonies were created by the need for an educated ministry (Coulter 1940, pp. 5-8).

The role of the clergy was a leading force in the founding of the colonial colleges, eight of the nine pre-Revolutionary colleges were Christian in origin (Brubacher 1958, p. 8). Although life was very poor in the colonies, the Christian churches encouraged the stewardship that had supported the English colleges in England. The American college was an expression of Christian charity, giving aid to needy young men and receiving aid from wealthy aged men (Rudolph 1962).

The first endowment to a college in the colonies was for the purpose of providing trained leaders for the church. In 1638 John Harvard, a minister from England, who had died only 1 year after arriving in America, left his library of over 400 volumes and half of his estate, which comprised between 470 and 800 pounds sterling, for the supply and maintenance of an institution to train ministers (S.E. Morison 1935, p. 432 Appendix D). That institution, Harvard College, was patterned after the colleges of Oxford and Cambridge in England and became the model for the colonial colleges that followed.

Another large endowment to a colonial college was
prompted by Cotton Mather, a Harvard scholar and a member of
the College's Board of Overseers. In 1718, he persuaded an
English merchant, Elihu Yale, to donate about 800 pounds
sterling to Collegiate School in Connecticut with the promise
to use Yale's name to commemorate his gift and to reward
him. Wagner (1980) pointed out a significant difference
between the gifts of Harvard and Yale: "John Harvard's
gift of books and monies was only slightly larger, but the
giving was voluntary and completely unsolicited, a qualitative
difference of some magnitude" (p. 117).

Harvard College was established in a small, infant
community that was less than 10 years old and had a population
of fewer than 10,000. The colonial governments refused to
assume the burden of support of their first college, which had
no landed estates, rents, annuities, funds, or income-yielding
property of any sort. Initial voluntary support of the Colonial
College actually began with solicitations of possible benefac-
tors in England. In 1644, however, the New England Confederation
of Massachusetts Bay, Connecticut, New Haven, and Plymouth
colonies recommended that each family in New England contribute
a peck of wheat or a shilling in money to Harvard for fellow-
ships and scholarships. Later, in 1665, the General Court of
Massachusetts began by taxation to raise 100 pounds sterling
per year for paying teaching fellows and the president's salary
(Morison 1946, p. 15).

The financial structure of Harvard College remained
precarious until near the end of the century. Although
the College received a money donation from England, most of the colonial gifts and bequests to the College were in wild land. A few pounds were received from incomes of the College farm and the College marsh, and a group of local merchants donated 60 pounds sterling a year for seven years. One of the early college structures, Old Harvard Hall, was built in 1677 with 2,000 pounds donated by several towns in Massachusetts, New Hampshire, and Maine (Morison 1946, p. 19).

By the time of the American Revolution, Harvard was joined by eight other colleges that were being supported by the colonies. All were often on the verge of bankruptcy. Few wealthy men were available to make endowments or bequests of major significance; so the colleges began to cast about for various means of financial support. The first obvious method was to solicit small contributions from the people; in Colonial America, however, there were many farm products, but little cash, and more produce than pounds was the natural outcome of this subscription method of pledging aid to the colleges. Another method was for the early colleges to employ paid agents. The agents were not professional fund raisers, but were usually dedicated clergymen who would draw a percentage of the proceeds from their canvassing efforts (Rudolph 1962, p. 183).

It was other than charitable giving that marked college finances by the time of the Civil War when America
had approximately 250 colleges (Rudolph 1962, p. 47). The Northwest Ordinance, passed in 1787, contained a declaration for the encouragement of schools, and a surging expansion of new institutions in the West was precipitated. A further impetus was the Merrill Act of 1862, which provided grants of land to all colleges with the provision that the colleges teach agricultural and mechanical arts. The colleges in the new territories competed with each other for the limited number of potential students, and many paid students to enroll. The free tuition offered accented the colleges' need to appear democratic. Usage of the classical curriculum could display a more democratic image by also educating the poor (Rudolph 1962, pp. 197-198).

The search for a more democratic image also pervaded the established institutions in the East. In the mid-1800's, campaigns for charity and scholarship funds were again launched by Harvard and Yale Universities because college leaders were concerned that their students came principally from the privileged classes (Rudolph 1962, p. 199).

One of the most significant events for fund-raising was the Dartmouth College Case of 1816-1819. In ruling that New Hampshire could not take over Dartmouth College, the Supreme Court indirectly gave rise to an important fund-raising movement, for religious organizations could then be sure that their efforts would not be usurped by government. After the Civil War, the state universities, the land-grant colleges, the technical institutes, and the old line colleges were all competing for students. They found financial support from their alumni and from a new class of wealthy Americans--philanthropists (Rudolph 1962, p. 188). Competition among the colleges forced scholarship
funds to increase and tuition to stay low in order to attract students. The hidden difference, the increasing cost of educating students, was absorbed by the faculty through salary cuts or deficit-sharing. This exploitation of the faculty allowed philanthropists to indulge in ego gratification by having buildings named after them or to indulge in their fantasy of importance for having educated the down-trodden and the poor (Rudolph 1962, 199-200).

Today, in addition to independent institutions, public colleges and universities solicit gifts to raise their educational capabilities and to improve their research (Desmond 1964).

**Motivations for Philanthropic Support**

During the seventeenth century, there was created a new word that enlarged the concept of charity from the idea of single, small donations to the larger view of sustaining and endowing gifts. This new word was a combination of two Greek root words--philo, meaning love, and anthropos, meaning all humanity--"philanthropy."

According to Henry Allen Moe, formerly of the Guggenheim Foundation, "the motivating force of philanthropic gifts through all the ages then and now has been a religious one in its essence--to do good in the world, to help one's fellow men who need help" (Hunter 1968, p. 7).

A number of studies have attempted to discern motivations for giving. In 1965, W. Willard Hunter interviewed
30 men who had given at least one million dollars to charity and asked them to identify the major convictions that had influenced their decision to give. The donors responded that they donated primarily to a cause they considered to be worthy, that they had a personal interest in or an association with, or when they knew that the organization was well run and administered. Other responses were that they would donate if they sensed a real social need, felt a particular community obligation, had an opportunity to influence youth, had confidence in an organization, or benefited for personal tax reasons (Hunter 1975, p. 178).

Hunter's study indicated that private donors give their time and their dollars to causes they feel are worthy and those in which they are personally involved. Tax factors may precipitate a gift, but in the majority of cases, taxes affect the amount given or the timing of the gift more than the donation itself. The main body of donors in Hunter's study stated that their gifts would diminish considerably if deductibility were withdrawn, and the majority felt that deductibility was critical for encouragement of private giving. The 30 philanthropists, in the main, donated land or buildings; and for the most, education was the recipient of their largesse.

In a conceptual, rather than an empirical work, Thomas Ireland in "The Calculus of Philanthropy" (1969) identified economics "as the science concerned with individuals as they allocate scarce resources among wants and
needs into the use of public goods" (p. 23). Ireland explained five categories of motives that induce contributions. The first category is the donor's desire to give to those public causes that directly benefit himself. The second is the desire to see others benefited. The third is the desire of the donor to act in a "good" fashion, as articulated by the German philosopher Immanuel Kant. Kant held that an individual performed a "good" act only when no satisfaction was gained by the person performing the act. A "good" act could be performed only because the quality of goodness was attributed to the act, not the actor. The fourth category is political. The motive might be an effort by the donor to create or maintain a position of prestige in the community, to direct the development of the community, or as a way of seeking corporate advancement. The final category of motives is that of making a donation as a condition of employment. Although an employee may not be dismissed for noncontribution, Ireland pointed out that "there is a specific level of contribution by which an employee can prevent a 'bad' result" (p. 30).

Ireland used the Kantian motive in developing an abstract model to discover the point beyond which satisfaction is derived by a donor contributing dollars. When there is no longer satisfaction (or utility), the dollars might bring a greater satisfaction to the donor by being used in alternative ways. The free-rider problem—-that is,
the tendency of persons to take a "free ride" at the expense of others who contribute in their place--affects an individual's contributions. Even if the motive is to act in a "good" fashion, the donor must weigh the consequences of his contribution; by donating an additional dollar, he may encourage someone else to take a "free ride" (p. 24).

A number of studies have attempted to discern motives for giving by mathematical manipulation of existing data. Hochman and Rodgers (1973) concluded in their 1969 study that utility interdependence--multiple sources of satisfaction--was a reasonable, conceptual approach to explaining charitable giving. They developed a model hypothesizing that contributions vary directly with mean income and its dispersion within a community. They reasoned that donors' gifts vary directly with the rise and fall of their income, and the greater the difference among income levels the more contributions could be expected (p. 68).

The variables used in their study were per-capita, after-tax income; a distribution variable measuring income dispersion or inequality; community size (population); and dummy variables for four geographic regions, the West, the South, the Midwest, and the Northeast. These dummy variables were included to provide a rough test of whether the tendency to transfer through contributions differs among regions.

Conventional multiple-regression procedures were
used to estimate the propensity-to-transfer (resources) function. All equations showed a significant association between contributions and the independent variables. After-tax income and the dispersion variables were positively and significantly related to giving. The population variable was insignificant. Results regarding the regional location of cities could be interpreted two different ways. On one hand, the results showed that donors in the Midwest were more generous than in other regions, particularly the South. However, once the influence of income difference had been removed, southerners appeared to be the most generous geographical group, and midwesterners were slightly less generous than city dwellers in other areas.

Hochman and Rodgers had hypothesized population to be relevant, because "the theory of public good distinguishes between cases in which a large number of persons benefit from provision of collective good and cases in which the number of beneficiaries is small" (p. 68). Since large groups (characteristic of large cities) are usually anonymous, the free-rider problem is likely to be operative. Donors in a small group (smaller communities), however, may be affected by social pressure and the knowledge that their contribution is important; therefore, according to the authors, free riding may be reduced.

To test the free-rider hypothesis, Hochman and Rodgers utilized population as the measure of community
size. As noted, results failed to support their postulate.

Tax incentives have been the primary focus of several studies. In writing of techniques and patterns in fund raising, Harold J. Seymour (1966) stated that

"you will find among all senior fund raisers that deductibility encourages giving. I think that it tends to keep giving standards up among high-income people and that it helps the uninformed to make judgments about what kind of institution should have their aid just because the Internal Revenue says the cause is taxably kosher..." (Foreward, p. xviii).

Michael K. Taussig (1967) investigated policy issues related to contribution deductibility and attempted to measure the "incentive effect," or the responsiveness of the level of private giving to changes in the price of giving caused by the deductibility of gifts (p. 3). He hypothesized that an increase in donations or contributions should be expected if gifts are deductible because deductibility lowers the relative price of a gift and increases the level of private disposable income.

The economic and demographic variables Taussig used were net worth, the size of the family unit, the age of the family members, the value of unusually large medical expenses, and a family's nonhuman wealth (using the level of nonproperty income and the level of capital gains as separate independent variables) (p. 7). Taussig used income classes of adjusted gross income (AGI) groups on which to run his tests. The general conclusion was that the
incentive effect is significantly stronger among higher income individuals than among the bulk of the population. His regression results showed that in the absence of pressing needs (health expenses, for example) giving increases. Giving is higher also for older as opposed to younger persons. The overall results showed that it is primarily giving from wealthy donors that is most vulnerable to changes in the present tax deduction, while most giving from low and middle income donors appears to be relatively insensitive to the deduction subsidy.

Taussig found the incentive effect of the deduction for charitable contributions to be uncertain: "Without knowing the relative strength of the price and income elasticities of giving, the best that can be said is that the price (marginal tax rate) effect will induce less giving while the income effect will induce more giving, but on theoretical grounds the net effect is unknown" (p. 17).

Robert Schwartz, in a 1970 study, came to a different conclusion. He attempted to determine primarily the extent to which "philanthropic" behavior is truly influenced by the needs of others. In other words, which is more important, the gain a donor receives in performing a charitable act or the benefit the act does for others?

Schwartz said that a person making a philanthropic transfer normally does not expect anything in return. However, if A enjoys a greater level of satisfaction when B is better
off, it can clearly be rational to him to enhance B by contributing to his welfare. Thus a philanthropic act does involve a sort of quid pro quo in the form of direct psychological utility rather than an economic resource which is utility generating. As B's income increases relative to A's, A gives less to B.

Schwartz's dependent variable was donations (contributions). The independent variables were the price of charity--the actual cost of the gift minus the tax saving (the tax saving is determined by the marginal tax bracket the donor is in)--and donor's current disposable income plus other current disposable income (using a measure including non-itemizers) (p. 1273).

The dates covered were 1929-1966, except for the year 1951. After 1954 odd-numbered years were used. Tests were performed for the entire time span as well as for the 1929-1943 and the 1944-1966 periods. (The 1943 extension of the standard deduction option caused changes in the sample coverage.) Tests were run on three sets of adjusted gross income groups--$0-$10,000, $10,000-$100,000, and $100,000 and above.

The study concluded that the variations in the donation series appears to be well-explained by the independent variables (p. 1278). Price and the two income variables tended, generally, to be significant. Donations give evidence of an inelastic response to changes in these three independent
variables. Giving rates are negatively related to price and positively related to income. The study confirms that donations are, in part, philanthropic; that is, utility function interrelationships comprise the motive for giving (p. 1290). The evidence indicates the existence of higher price elasticities than Taussig reported.

Reporting on his own work, Martin Feldstein (1975), who headed the research effort for the most important study yet conducted on private giving in America, the Filer Commission, concluded that charitable contributions were increased substantially by tax deductibility. Almost all of his estimates of the price elasticity were greater than one. Feldstein compared his work and results with those of Taussig and Schwartz and found Taussig's research had short-comings, while Schwartz's results were near his own findings.

Feldstein's study consisted of a time-series analysis of the AGI classes published by the IRS for the even years from 1948 through 1968 to determine if the "price" of charitable gifts is less than the price of other consumption. The price variable measured the individual's opportunity cost per dollar of charitable contribution in terms of forgone personal consumptions (savings). The income variable was the average real value per tax return of adjusted gross income minus taxes. Feldstein proposed that the use of official tax returns was limiting to his and other studies because of the lack of information on permanent income
and wealth. "Adjusted gross income becomes a less adequate measure as income rises" (p. 99). Feldstein also felt that analyzing the contributions of only those taxpayers with itemized returns was a shortcoming, because it left out information of charitable giving by lower-income individuals. He noted further that demographic characteristics such as educational background, religious affiliation, and other factors that influence charitable giving may be correlated with the income and price variables in a way that biases the estimates.

In a second part of his study, Feldstein concluded that gifts to educational institutions and hospitals are highly sensitive to the cost of giving, while giving to religious organizations is much less sensitive. Feldstein observed

Eliminating the charitable deduction would reduce total individual giving by an estimated 20 percent, but gifts to educational institutions and hospitals would be cut approximately in half. Further, even though replacing the current (at that time) deductible by a 30 percent tax credit would have increased total giving by some 15 percent, educational institutions and hospitals would still have lost about 20 percent of the current gifts (p. 209).

Feldstein showed that in considering tax proposals and their effect on charitable giving, the relative importance of gifts to religion, education, hospitals, and health varies greatly between low income and high income donors (p. 212). Using 1962 tax data for his study, he showed that while 81.6 percent of total itemized gifts to religious
organizations comes from households with AGI below $15,000, only 24.6 percent of gifts to educational institutions comes from this group. Similarly, only 1.1 percent of religious gifts comes from taxpayers with incomes over $100,000, while this group provides 33.1 percent of gifts to educational institutions. His results implied that eliminating the charitable deduction would cause charities to lose slightly more revenue than the Treasury would gain in additional taxes. Feldstein argued that if the deduction were replaced with a tax credit or matching grant, overall giving would not be reduced, but the distribution of giving among different types of charities would substantially change. He concluded that if support for higher education, hospitals, and cultural events is to continue, the charitable deduction must be maintained.

In his study on deductibility of charitable bequests, Stephen K. McNees (1973) concluded that tax deduction for charity should be replaced by a discriminating tax credit that would recognize the value society places on the activities of each type of charitable organization. His study was based on the deduction provision of the federal estate tax, and he hypothesized that charitable bequests behavior was determined by the size of the donor's estate, the marginal tax rate (MTR) to which it is subject, the donor's marital status, age, state of residence, number of dependents, and tax "sensitivity" (knowledge of tax law); and the per-
centage of the donor's bequests given in trust form. McNees found that wealth, marginal tax rate, dependents, and percentage of bequests in trust variables were statistically significant (p. 95).

McNees concluded that, assuming a tax credit would be adjusted to keep the aggregate amount of disposable estate unchanged, tax credits would be better than deductions. With the subsidy distributed in direct proportion to contributions, the share accruing to the upperwealth classes would drop as would their charitable bequests (p. 95). McNees observed that "smaller estates would bequeath more to charity as a result of lower price of contributions and the additional after-tax wealth which would be at their disposition" (p. 95).

Ralph Nelson (1970) investigated the economic factors related to the growth of corporate giving. Using time-series data in order to measure their separate effects, three variables were identified: the net income of corporations (to indicate the scale of corporate activity), the net after-tax credit or "price" of a given dollar amount of contributions, and a group of other factors which affect giving in the long run (the most apparent of which is an increase in the giving propensity of corporations). Nelson felt that contributions should bear a proportionate relationship to the scale of corporate activities over time; therefore, price and giving propensity were held constant (p. 8).
Nelson found that changes in corporate tax rates over the period of time changed correspondingly with the net after-tax cost or "price" of a given dollar contribution. In other words, the suggestion was that tax rate changes are in correspondence with certain tax savings that accompany contributions. Nelson found price and income to be unit elastic (p. 9).

The relationship between the size of a corporation and the amount of its contributions was examined also, and it was found that the share of corporate income given was proportionate to corporate revenues. The number of persons employed also appeared to have an important influence on the percentage of income given.

John F. Cushman's 1979 study on charitable giving by foundations delved into motivations for charity, a discussion of foundations and how they give, how the 1969 tax reform affected foundations and their giving, and a discussion on foundations behavior. Cushman approached his study by the use of aggregated pre-tax and post-tax data for 1969 and 1973. He used linear regression on data divided into pre-tax reform and post-tax reform categories to search for specific factors that affect foundation giving. The regression was set up to assess the influence of variables on foundation giving and the impact of tax reforms on these variables. The variables used were contributions, the market value of the foundations' assets in a given year,
the sum of all income received by the foundation, all gains or losses received from sale of assets, all officers' compensation, other foundation expenses, the stock concentration of the foundation assets, those foundations owning 20 percent and those owning 5 percent of the voting stock in a corporation, and the holdings of the single largest stockholder (pp. 175-177).

The results of this study indicated that foundation giving is positively affected by assets and income. The salary of the foundation administrator was positively related to giving as were higher rates of return. Most expenses that lowered budget constraints reduced giving. Money contributed to foundations did not affect the amount foundations contributed to others.

Also of concern to Cushman, as reflected in concerns of the late 1960's, was the noncharitable behavior of foundations; that is, what goes on within foundations that impacts potentially on giving and related matters. One of the things that Cushman found was the higher the concentration of foundation assets in corporate stock, the lower corporation giving is. But more to the point of noncharitable behavior, Cushman reported that a high concentration of foundation assets in particular corporations and the possible corporate control did not hinder giving by the foundation (p. 197).

The minimum pay-out provision called for by the 1969 Tax Reform Act appears to have stimulated an increase in foundation giving; the increase may not prove to be
positive or long-lasting, because foundations have had to erode their assets to meet these payments (pp. 111-137).

Factors Accounting for University Fund-Raising Effectiveness

The last study reviewed, "Increasing Fund Raising Effectiveness," a doctoral dissertation by William L. Pickett, brings together much of the work done in higher education. His is a broad-based study specific to higher education, cutting across higher education institutions overall.

In his study to determine the fund-raising effectiveness of 200 colleges, Pickett (1977) concluded that effectiveness could not be measured simply by the total number of dollars raised. Rather, he held that the percent of fund-raising potential achieved was the best measure. "Larger, wealthier, more expensive, and higher quality institutions will raise more money, not because they are more effective in their fund raising, but simply because they have better access to the wealth that exists in their environment" (p. 9). He further concluded that even when those potentials are considered (held constant), some colleges will raise more money than others if they have superiority in three areas: trustee leadership, sense of institutional direction, and investment in the advancement function.

Using regression analyses, Pickett identified four variables that best predicted income. They were (1) market
value of endowment—the college's liquid assets that are not directly affected by annual operations, (2) number of alumni, which of course correlates highly with the enrollment and age of the institution, (3) cost of attendance—an indicator of the socioeconomic level of the clientele, and (4) percentage of the senior class entering graduate school—a measure of academic quality.

Pickett next identified 25 percent of the sample as overproductive and 25 percent as underproductive fund raisers, using a formula to estimate how much cash each of the colleges should have raised, given their wealth, size, wealth and social class of their clientele, and academic quality. Responses to a questionnaire were used to determine what fund-raising techniques were used by each institution.

Statistical analysis of the responses showed that the overproductive colleges were significantly different from underproductive colleges in that the former had (1) higher average expenditures for institutional advancement, (2) a greater number of institutional advancement staff, (3) fund-raising programs composed of four essential functions—annual giving, capital giving, deferred giving, and prospect research, (4) larger number of names on mailing lists, (5) strong institutional case statement, and (6) active trustee development committees. Pickett interpreted those six differences as deriving from superior trustee leadership, clearer institutional direction, and greater fund-raising effort.
In light of the studies reviewed in this chapter, the following section is offered as a way of setting the stage for examining voluntary support for higher education in this study. The section is synthesized from the work of Cushman (1979).

**Conceptual Framework**

The Economics of Charity recently has been added to the Theory of Exchange, the standard approach in economics for viewing transactions between two parties. Charitable giving previously has been excluded, because Exchange Theory assumes a two-person, two-good condition in which each party benefits from a mutual exchange of tangible goods. The theory had been considered inappropriate because charitable giving does not involve a visible quid pro quo.

To solve this problem, interdependent utility functions have been employed to expand the Theory of Exchange to include charitable giving. Simply put, it is now recognized that individuals may benefit not only from their own consumption but from the consumption of other persons in society. This benefit may be only psychological, or ultimately it may be tangible, albeit indirect. Applying charity theory, the relationships may be expressed as follows:

\[ U^A = U^A (X_1^A, X_2^A) \]
\[ U^B = U^B (X_1^B, X_2^B, X_1^A) \]

Here, person A's welfare is affected only by the amounts of goods, \( X_1 \) and \( X_2 \) consumed, whereas person B's welfare
includes consumption of $X_1$ by person A (all partial derivatives are positive). This is because person B gains utility, psychological or tangible, from consumption by person A. In the real world the situation is much more complex, with many persons gaining from the consumption of many goods, in varying amounts, by many other people. One such "gain" is simple, personal altruism.

Likewise, in the real world, more than mere transfer of goods may be involved; individual B may benefit from the increased income of individual A. Individual B's utility function thus may be expressed as $U^B = U^B (y^B, C^B)$ where $y^B$ is B's income and $C^B$ is the value of B's dollar contributions to charity.

Although private giving to colleges and universities may be viewed in this simple way, the true dynamics are more complex. Individuals may give for other than purely altruistic reasons, for example, to insure the marketability of their degrees earned from an institution that might otherwise go out of business or suffer a loss in prestige stemming from inadequate resources. They may also wish to send their children to the institution or themselves continue to consume the institution's offerings through further study or by attendance at institutional events. Or, the satisfaction gained may accrue simply from the prestige gained from making the donation. They may also enjoy the long-term association in the clubs and activities of the institution.
Complications concern taxation and the matching principle stipulated by many benefactors. Regarding the former, a dollar given to higher education costs the giver one dollar only if no tax deduction is taken. A taxpayer who itemizes deductions and is in the 50 percent tax bracket actually pays only $50 for a $100 gift. Regarding the latter, the matching principle provides that some other benefactor will match, in some proportional manner, each dollar given; thus, the donor knows that his gift will in fact yield more to the institution than he gives.

Each of these considerations can be captured in the model

$$\log C_i = a_1 + a_2 \log Y_i + a_3 \log P_i + a_4 \log O_i + U_i$$

where $C_i$ is dollar contributions of the $i$th individual, $a_1$ is a constant, $Y_i$ is income, $P_i$ is the price of giving, $O_i$ is any other factor deemed relevant and $U_i$ is the error term.

Of course, under the theory "individuals" may be corporations or any other giver. Corporate behavior, though, is more difficult to explain. One approach is to view corporate donations as means of profit maximization, with giving seen as public relations or in the case of local donations, as a fringe benefit to local employees.

Most recent empirical work has shown individual private giving to be price elastic and income inelastic, with price elasticities generally falling between 1.1 and
1.5 (but as high as 2.0) and income elasticities around .8 (Commission on Private Philanthropy and Public Needs 1977). Corporate giving has been found to be elastic in regard to price and income by Nelson (1970) but to be income inelastic by Schwartz (1968), who also seemed to show that advertising and profit enhancement are not major motives for corporate largesse. In sum, the empirical evidence supports charity theory although the income effect is not large.

The variables used in this study are shown on Table 1. They are divided into three categories: psychological, financial, and other reasons for giving.
Table 1. Categories for Variables Used in this Study

<table>
<thead>
<tr>
<th>Psychological Variables</th>
<th>Financial Variables</th>
<th>Additional Variables</th>
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<tr>
<td>Age of the institution</td>
<td>Dividend and interest income in state</td>
<td>Total number of alumni per institution</td>
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<td>Quality rating of an institution</td>
<td>Wealthy/poor regions</td>
<td>Sunbelt/snowbelt regions</td>
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<td>Sector of control, public/private</td>
<td>State appropriations per FTE</td>
<td>Holdings of top state wealth holders weighted by institution enrollment as a percentage of state enrollment</td>
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<tr>
<td>Religious affiliations, charismatic, liturgical, Roman Catholic</td>
<td>State percent of federal income tax returns itemized</td>
<td>Size of an institution (FTE)</td>
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<td>Percent solicited</td>
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<td>Percent contributing</td>
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<td>Bond yield on high grade bonds</td>
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<td>Implicit price deflator for consumption component of gross national product</td>
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<td>Implicit price deflator for gross national product</td>
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<td>Total giving</td>
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CHAPTER 3

METHOD

This chapter is organized into two major sections, cross-sectional analysis and time-series analysis. Each section contains an overview paragraph, followed by descriptions of the sample, the variables, the data sources, and the statistical method employed.

Cross-Sectional Analysis

Cross-sectional analysis was used to identify factors accounting for variations in levels of support to individual institutions at one point in time. The method allowed for specifying the relative importance of each factor in explaining these variations. Two types of analysis were used: correlation and regression.

Sample

The sample consisted of Research University I (RUI) and Liberal Arts I (LAI) institutions for the year 1977-78. Forty-one of the 51 RUI's and 102 of the 123 LAI's were selected. The excluded institutions were those for which financial support data were not listed in Voluntary
Support of Education 1977-78 prepared by the Council for Advancement and Support of Education or for which quality ratings were not provided in the 1967 Gourman Report. The year 1977-78 was selected because it was the most current year for which information on these institutions was available.

The Carnegie Council on Policy Studies in Higher Education (1976) classified RUIs as the 51 leading universities in terms of financial support of academic science in at least two of the three academic years—1972-73, 1973-74, 1974-75—provided they awarded at least 50 Ph.D.'s plus M.D.'s (if a medical school were on the same campus) in 1973-74. The Carnegie Council classified LAI's as the most selective liberal arts colleges as measured by a selectivity index or those included among the 200 leading baccalaureate-granting institutions in terms of their graduates receiving Ph.D.'s at 40 leading doctorate-granting institutions from 1920 to 1966.

Variables

The dependent variable, voluntary support (G), was measured in millions or thousands of dollars, depending upon the model. As defined in Gift Reporting Standards (Council for Financial Aid to Education 1978-79), voluntary support is the amount of money given to higher education by individuals, foundations, business corporations, religious
denominations, and other sources. Excluded are earnings from endowment and other invested funds and support received from federal, state and local governments, and their agencies.

Voluntary support includes all revenues from non-governmental organizations of individuals, including monies resulting from the purchase of goods or services by non-governmental entities on a contractual basis. Unrestricted gifts, grants, and bequests, as well as restricted gifts and grants to the extent they are expended for current operations (including scholarships and fellowships) are included in this category. Also included are income from funds held in revocable trusts or distributable at the discretion of the trustees of such trusts; monies received as a result of gifts, grants, or contracts from a foreign government, and endowments. An endowment is a fund of which a principal is not expendable and which is intended to be invested in order to produce income that the governing board of an institution, rather than a donor or other external agency, has determined is to be retained or invested.

The independent variables were:

Age of the institution (AG)—age indicates stability, prestige, and the number of alumni. It was expected that the oldest and most prestigious institutions would attract the greatest amount of support.

Total number of alumni per institution of record (AL)—the expectation was that the greater the number
of alumni, the more donors available to the institution and thus the greater giving.

Dividend and interest income in the state (DIY)—it was anticipated that those persons in the state receiving dividends from stocks and interest from investments would be more apt to donate to institutions of higher education.

Sector of control—public (DPUB)—indicates that the institution is public/private. It was anticipated that public institutions would receive less voluntary support than private ones, since it is known, in general, that is the pattern nationally.

Religious affiliation (DREL)—Religious institutions are always private institutions; therefore, it was anticipated that they would receive greater amounts of voluntary support than public institutions. However, it was also hypothesized that among private institutions, those religiously affiliated would receive greater support.

Wealthy-poor region (DRY)—wealthy regions include New England, Middle Atlantic, East North Central, and Pacific regions. It was anticipated that the schools located in the wealthy regions would attract more voluntary support than those in poor regions.

Sunbelt/snowbelt region (DSB)—this variable was to determine if there was greater voluntary support
given to institutions in more rapidly growing regions.

Holdings of top state wealth holders weighted by institutional enrollment as a percentage of state enrollment, in millions (PSW)—it was anticipated that institutions in the states with the highest number of state wealth holders would necessarily receive a greater amount of donations. Holdings were weighted by institutional enrollment as a percentage of state enrollment to ascertain a proportional value.

State income weighted in millions of dollars (PSY)—the assumption was that those institutions located in states with the greatest amount of income would glean the greatest amount of economic support.

Quality rating of an institution (QL)—it was surmised that the higher the quality rating for an institution, the greater the likelihood of it gaining more voluntary support than other institutions.

Charismatic, protestant affiliation (includes Baptist, Disciples of Christ, Mennonite, and United Church of Christ) (RPCH)—private church-supported institutions were categorized in an attempt to determine if one category might be more prestigious or more economically advantaged than the other. This variable was used to determine whether charismatic, protestant-affiliated institutions received more or less support than those categorized as liturgical protestant or Roman Catholic.
Liturgical, protestant affiliation (includes Lutheran, Moravian, Presbyterian, Episcopalian, Methodist, and Wesleyan) (RPLIT)--this variable was used to determine whether liturgical, protestant-affiliated institutions received more or less support among private, church-supported institutions than those categorized charismatic protestant or Roman Catholic.

Roman Catholic affiliation (RRC)--this variable was used to determine whether Roman Catholic institutions received more or less support among private, church-supported institutions than those categorized as charismatic protestant or liturgical protestant.

State appropriations to higher education per full-time equivalent student in millions (SA)--this variable was used in an attempt to answer the question: To what extent does state support of higher education displace voluntary support to higher education?

Percentage of alumni contributing to annual campaign (PC)--it was anticipated that the greater the number of alumni contributing to the annual campaign, the greater the dollar amount of voluntary support received by the institution.

Percentage of alumni solicited in annual campaign (PS)--it was thought that the more alumni solicited, the greater the chance of increasing voluntary support to the institution.
State percentage of federal income tax returns itemized (SIT)—since itemized returns give persons a tax advantage, it was thought in the states where more itemizations were reported that more funds would be channeled to institutions.

State per capita income (SPCY)—this economic factor was used to attempt to determine whether the more income held by each individual in a state increases the amount of voluntary support to the institutions in that state.

Holdings of top state wealth holders in millions of dollars (SW)—it was anticipated that those institutions in states with the greatest number of wealth holders would receive the greatest amount of voluntary support.

Number of top state wealth holders (SWH)—those states having the greatest numbers of state wealth holders were expected to have the greatest amount of voluntary support given to their institutions.

State income, in millions (SY)—this state economic factor was used to determine if a proportionate share of income or wealth of a state might be apportioned via voluntary support to its institutions.

Size of an institution as determined by full-time equivalent student enrollment (SZ)—it was anticipated that the more alumni to be solicited the greater the donations to the institution.
Sources of Data

Contribution and alumni data were from *Voluntary Support of Education* (1977-78); enrollment data were from the *Digest of Education Statistics* (1980) and from *Opening Fall Enrollment Tapes* (1977) of the Center for the Study of Higher Education, University of Arizona. Data on age and religious affiliation came from the *Education Directory, Colleges and Universities 1977-78* (1978); and the *Gourman Report* (1967) provided the proxy variable for quality. *Statistical Abstract of the United States* (1979) provided the state economic and tax data; state government support figures were from M. M. Chambers data.

Statistical Approach

After a correlation analysis was completed, four theoretical models--an overall contributions model, a per alumnus contributions model, an economic resource model, and an eclectic model--were tested in an effort to determine the best estimate of variations of levels of voluntary support. Least squares estimation was the analysis method.

**Overall Contributions Model.** An assumption was made that contributions are best explained by separating them into two components--contributions per alumnus, using the symbol $t_{li}$, and contributions independent of number
of alumni, using the symbol $t_{0i}$. The first assumes that per alumnus contributions have no explanatory power, which is equivalent to

(Submodel la) $t_{1i} = 0$.

This means that the model considers the relationship of the independent variables to giving, independent of the average giving by each alumnus.

Therefore, Model I assumes that giving is some constant, non-per-alumnus related amount:

(Submodel lb) $G_i = t_{0i}$

The quantity $t_{0i}$ varies from institution to institution, depending upon such factors as institutional quality and upon efforts to solicit contributions, as well as the size of the institution.

A preliminary equation was then formed.

Preliminary Equation (1) $G_i = t_{0i} + t_{1i} AL_i$

Preliminary Equation (1) plus Submodel (lb) constitute Equation (1). Equation (1) is the overall contributions model, Model I.

In equation (1) $t_{0i} = \alpha_0 + \alpha_1 AG_i + \alpha_2 QL_i + \alpha_3 KRC_i + \alpha_4 RPLIT_i + \alpha_5 RPCH_i + \alpha_6 PC_i + \alpha_7 PS_i + \alpha_8 SZ_i$ (Again, $t_{1i} = 0$.)

In testing Model I, the following questions were asked:

1. How do age and quality vary apart from the size of the institution?

2. Are the religion dummy variables jointly significant?
3. How sensitive is giving to solicitation efforts, either through the success of the efforts (PC) or the extent of the efforts (PS)?

4. Does the structure of the model change significantly when account is taken of public versus private institutions, wealthy versus poor regional locations, and sunbelt versus snowbelt regions?

Model II, however, seeks to control for the number of alumni an institution has by putting all of the independent variables on a per student basis. That is, the model, in multiplying each independent variable by each institution's number of alumni, put all the institutions on a common comparable base.

**Per Alumnus Contributions Model.** The alumni contributions model, Model II, explains contributions through per alumnus giving, taking non per alumnus giving as a constant. In the following submodel, \( J \) represents the average contributions per alumnus, \( AL \) is the total number of alumni of record of the institution, and \( K \) represents nonalumni average contributions. The average contributions would be expected to vary from institution to institution.

Submodel (2a) \[ G = j \cdot AL + K \]

A second submodel examined how per alumnus contributions vary using nonalumni giving as a constant.

Submodel (2b) \[ t_{oi} = \bar{t}_{o} \text{ constant.} \]

Preliminary Equation (1), \[ G_{i} = t_{oi} + t_{li} \cdot AL_{i} \]

that was formed for the overall contributions model was
also the basis for the equations in the per alumnus contributions model. In forming the preliminary equation for the per alumnus giving model, contributions per alumnus were expected to vary from institution to institution in the following way:

\[
P_{li} = \beta_0 + \beta_1 AG_i + \beta_2 QL_i + \beta_3 RRC_i + \beta_4 RPLIT_i + \beta_5 RPCH_i + \beta_6 PC_i + \beta_7 PS_i
\]

Size was not important in this formulation, since size is reflected in the variable alumni (AL). Combining Submodels (2a) and (2b) and Preliminary Equations (1) and (2) constitutes Equation (2), which is also the per alumnus contributions model, Model II.

\[
G_i = \bar{t}_0 + \beta_0 AL_i + \beta_1 AG_i XAL_i + \beta_2 QL_i XAL_i + \beta_3 RRC_i XAL_i + \beta_4 RPLIT_i XAL_i + \beta_5 RPCH_i XAL_i + \beta_6 PC_i XAL_i + \beta_7 PS_i XAL_i
\]

A test of the per alumnus contributions model involved the same four questions posed for the overall contributions model. In addition, the question was whether Model I or Model II offered better explanatory power.

**Economic Resources Model.** This model tested whether or not voluntary contributions may be better explained by the economic resources of the state in which the institution is located, using state income and state wealth variables. In this view institutions received a certain proportion of state income (PSY) and wealth (PSW), which was weighted by the size of the institution and took into
account the total number of institutions in the state:

Submodel (3a) \( G_i = \delta_0 + \delta_{1i} \text{PSY}_i + \delta_{2i} \text{PSW}_i \)

The proportions \( \delta_{1i} \) and \( \delta_{2i} \) can be expected to vary from state to state, depending on state governmental and economic factors:

Submodel (3b) \( \delta_{1i} = \delta_0 + \delta_1 \text{SA}_i + \delta_2 \text{SIT}_i + \delta_3 \text{SPCY}_i \)

Submodel (3c) \( \delta_{2i} = \Sigma_0^1 \text{SA}_i + \Sigma_2^1 \text{SWH}_i \)

Combining Submodels (3a), (3b), and (3c) constitutes Equation (3), which is the economic resources model, Model III.

Equation (3) \( G_i = \delta_0 \text{PSY}_i + \delta_1 \text{SA}_i \text{XPSY}_i + \delta_2 \text{SIT}_i \text{XPSY}_i + \delta_3 \text{SPCY}_i \text{XPSY}_i + \Sigma_0 \text{PSW}_i + \Sigma_1 \text{SA}_i \text{XPSW}_i + \Sigma_2 \text{SWH}_i \text{XPSW}_i \)

A test of Model III raised the following questions:

1. To what extent does state support of higher education (SA) displace contributions from private resources?

2. How effective are income tax benefits (reflected in SIT) in stimulating contributions?

3. Do contributions increase when the wealth of a state's top wealth holders is distributed among more persons?

4. Can a stable relationship be said to exist between state economic resources and voluntary contributions to higher education?

Eclectic Model. Model I, the overall contributions
model, explained C through setting \( t_{li} = 0 \). Model II, the per alumnus contributions model, held \( t_{oi} \) constant. The eclectic model allowed both \( t_{li} \) and \( t_{oi} \) to vary. Thus giving was explained by two forces: the contributions of alumni on a per alumnus basis, Model II, and giving without regard to per alumnus contributions, Model I. The eclectic model, Model IV, is a combination of Models I and II.

Combining Equation (1) from Model I and Equation (2) from Model II yielded Preliminary Equation (4).

Preliminary \( G = \) constant term + QL + PC + PS + SZ + DPUBXSZ + DRYXAG - DRYXPC + DRYXSZ - AL - AGXAL + QLXAL + PCXAL + PSXAL + DPUBXAL + DPUBX + QLXAL + DPUBXPSXAL + DRYXAL

The variables quality (QL), percentage of alumni contributing (PC), and wealthy/poor region X percentage contributing (DRYXPC) and wealthy/poor region X age (DRYXAG) were not significant and were deleted, yielding Equation (4) which was the eclectic model, Model IV. To test the eclectic model over time, samples of RUIs and LAIs for the years 1972 and 1977 were used.

Equation (4) \( G = \) constant term + PS + SZ + DPUBXSZ + DRYXSZ + AL + AGXAL + QLXAL + PCXAL + PSXAL + DPUBXAL + DPUBXPSXAL + DRYXAL

A separate sample of RUIs for the year 1972 was used to test the eclectic model over time. This equation, Equation (4a), is exactly the same as Equation (4).

Finally, a separate equation was formed for LAIs for
the year 1977. Testing yielded a reduced form of Equation (4) that shows only two significant variables.

Equation (4b) \( G = \text{constant} + QLXAL + PCXAL \)

**Time-Series Analysis**

Time-series analysis was used to specify what factors explain total giving to higher education on a year-to-year basis. The analysis was an effort to determine what periodic changes impact on total giving to higher education in the aggregate or why the total amount of giving varies over time.

**Sample**

The sample was total giving (TG) of private gifts and grants to institutions of higher education from the years 1932 to 1966, biennially, and annually for the years 1968-1974. The contribution series was altered slightly after 1968 by the classification of a greater portion of sponsored research and other sponsored programs as voluntary contributions (from the miscellaneous category). The reclassified quantities were, however, very small relative to the total amount of contributions and did not appear to affect the results.

**Variables**

The dependent variable was total giving (TG) to institutions of higher education from 1932-1974. Total giving is the total nongovernmental gifts and grants to institutions of higher education, in millions.
The independent variables were:

Yield on high-grade corporate bonds, average for the year (BY), is used to measure the rate of return on investments which measures the opportunity cost of giving.

The implicit price deflator for the consumption component of GNP (CD) measures the prices of goods purchased by individuals. It is a measure of consumer price levels.

Implicit price deflator (D) measures general price levels.

Final sales, in billions (FS), depends on gross receipts of the sectors and is a measure of business activity.

Voluntary support (G) is the amount of voluntary support donated to higher education institutions in any year.

Gross national product, in billions (GNP) measures the level of economic activity.

Implicit price deflator for nonresidential fixed investment component of GNP (ID) measures prices of goods purchased by businesses.

Corporate profits with inventory valuation adjustment, in billions (PRF) is a measure of corporate profits.

Personal savings, in billions (PS), is personal income less consumption expenditures.

Personal income, in billions (PY).

Standard and Poor's 500 stock price index, yearly close (SP500) is used as an indicator of business conditions.
Government tax and nontax revenues (TAX) measures the amount of government intervention in the economy.

Further,

\[ XY = \text{variable multiplied by PY} \]
\[ XF = \text{variable multiplied by FS} \]
\[ XS = \text{variable multiplied by PS} \]
\[ XP = \text{variable multiplied by PRF} \]

Sources of Data

Biennial data from the Biennial Survey of Education in the United States were obtained from the Statistical Abstract for voluntary contributions from 1932 to 1968. For 1968-1974, the data were from the Digest of Education Statistics (1980). Stock price and bond yield variables were from Security Price Index Record (1980), and all other data were obtained from the Department of Commerce through the Economic Report of the President (1972, 1980).

Statistical Approach

Time-series analysis viewed contributions to higher education three ways—through gross receipts and net receipts of the public/private sectors and through national income. Two models, a gross receipts model and a net receipts model, were formed to determine contributions by business and by individuals. A third model, a national income model, was formed to determine contributions as a share of national income. Ordinary least squares regression
was the analysis method used for all three models.

For the gross receipts and net receipts models, the assumption was made that giving to higher education by individuals and by corporation varies over time with the level of economic activity, anticipated business conditions, the rate of return on investments, the price of goods purchased—as well as the general price level, and the amount of government intervention in the economy.

**Gross Receipts Model.** To view contributions through gross receipts, a submodel was tested with PY (personal income) representing individual contributions and FS (final sales) representing business contributions. The assumption is that a portion of these amounts (the coefficients) are given to colleges and universities.

Submodel (5) $G_t = \delta_0 + \delta_1 t PY_t + \delta_2 t FS_t$

A preliminary estimate is conducted by specifying the components of $PY_t$ and $FS_t$. Of these components, the preliminary estimate found the variables GNPXY, CDXY, GNPXF, and IDXF insignificant; and they were deleted, forming Equation (5), the gross receipts model.

Equation (5) $G = \text{constant term} + PY + SP500XY + BYXY + DXY + TAXXY + FS + SP500XF + BYXF + DXF + TAXXF$

To determine the share of total contributions by individuals over time, individual giving as it interacts with economic factors was separated from Equation (5),
To determine the share of total contributions by business over time, business contributions as they interact with economic factors were separated from Equation (5), forming

Equation (6) \( \delta_{1t} = \text{constant term} + \text{SP500}_t + \text{BY}_t + \text{ID}_t + \text{TAX}_t \)

Net Receipts Model. In order to view contributions through net receipts, a model, Equation (8), was formed in which personal savings and business profits represent the "net proceeds" to be tested.

Equation (8) \( G = \text{constant term} + \text{PS} + \text{GNPXS} + \text{SP500XS} + \text{GYXS} + \text{CDXS} + \text{DXS} + \text{TAXXS} + \text{PRF} + \text{GNPXP} + \text{SP500XP} + \text{BYXP} + \text{IDXP} + \text{DXP} + \text{TAXXP} \)

No breakdown of the net receipts model was attempted since the combined net receipts had little explanatory power.

National Income Model. A submodel, Equation (9a), which represented total giving as a share of national income (NY), was tested.

Submodel (9a) Total \( G = nNY + P \)

The proportion of income that is given to institutions of higher education is denoted by \( n \); however, \( n \) does not stay constant over time. It fluctuates according to the
movements of economic variables, as follows:

Equation (9) \( n = a_{SP500} + b_{BY} + c_{CD} + d_{D} + e_{TAX} + p \)

The expression for \( n \) inserted into the preceding submodel gives the national income model.

Extended TG = \( a_{SP500XNY} + b_{BYXNY} + c_{CDXNY} + d_{DXNY} + e_{TAXXNY} + f_{NY} + p \)
CHAPTER 4
FINDINGS

This chapter presents the findings from the cross-sectional analysis of levels of private giving among institutions, followed by the findings from the time-series analysis explaining year-to-year differences in aggregated giving.

Cross-Sectional Analysis

This section is divided into two parts. The first is a presentation of simple correlations among the dependent and selected independent variables. This analysis shows basic relationships among the data. The second part presents the multiple regression analyses, which answer the research questions. The regression analyses not only identify the variables (of those examined) that explain varying levels of giving across institutions, but they also estimate the relative importance of each variable. Tables in this section summarize the correlations and regression analyses.

Correlations

Tables 2 and 3 in this section present the simple correlations for RUIs and LAIs, respectively. Table 4 summarizes correlation results.
Table 2. Correlation Matrix for Research Universities I

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Table 3. Correlation Matrix for Liberal Arts I Institutions

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<td>-0.05</td>
<td>0.92</td>
<td>0.11</td>
<td>0.30</td>
<td>0.49</td>
<td>0.02</td>
<td>0.47</td>
<td>1.00</td>
</tr>
<tr>
<td>DREL</td>
<td></td>
<td>-0.36</td>
<td>-0.33</td>
<td>0.02</td>
<td>0.16</td>
<td>-0.86</td>
<td>-0.26</td>
<td>-0.17</td>
<td>-0.23</td>
<td>-0.17</td>
<td>-0.24</td>
<td>-0.29</td>
</tr>
</tbody>
</table>
Table 4. Summary of Important Correlation Results in Cross-Sectional Analysis

<table>
<thead>
<tr>
<th>Type</th>
<th>Institution</th>
<th>Noteworthy Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlation</td>
<td>RUIs</td>
<td>G with DIY and QL, SY with SA, SW with DRY</td>
</tr>
<tr>
<td></td>
<td>LAIs</td>
<td>G with DIY, QL, and AG</td>
</tr>
</tbody>
</table>

By "important" and "noteworthy" is meant relationships of central interest either for the research questions or to higher education financing generally.

Variables in Table 3.

G = Voluntary Support
QL = Quality rating of the institution
AG = Age of the institution
PS = Percentage of alumni solicited in annual campaign
SY = State income in millions
AL = Total number of alumni per institution of record
SA = State appropriations to higher education per full-time equivalent student in millions
SZ = Size of the institution
DIY = Dividend and interest income in the state
DPUB = Sector of control-public/private [Table 2 (0,1)]
SIT = State percentage of federal income tax returns itemized
SW = Holdings of state wealth holders in millions
DRY = Wealthy/poor region

Other Variables not in Table 3.

DREL = Sector of control-public/private [Table 3 (0,1)]
DSB = Sunbelt/snowbelt region
PC = Percentage of alumni contributing to annual campaign
PSW = Holdings of top state wealth holders weighted by institutional enrollment as a percentage of state enrollment in millions of dollars

PSY = State income weighted in millions of dollars

RPCH = Charismatic protestant affiliation

RPLIT = Liturgical protestant affiliation

RRC = Roman Catholic affiliation

SPCY = State per capita income

SWH = Number of state wealth holders

The correlations of primary interest are those showing the relationship of giving to the independent variables. Table 2 shows the highest correlation (.84) with amounts given to RUIs to be DIY (dividend and interest income in the state in which the institution is located). This is probably an artifact resulting from the fact that many high quality private institutions are located in wealthy states. Correlated almost as strongly is the dummy variable DPUB (public/private) (-.83). The negative sign means that being a private institution is strongly and positively associated with amounts contributed. The third most important variable is QL (institutional quality) (.73), which had a positive relationship to giving. The fourth most important variable is AG (age of the institution) (.50), followed by SIT (tax itemization) (.40). Next most important is SW (state wealth) (.31), followed by SZ (institutional size) (-.26), AL (number of alumni) (.20), and SY (state income) (.19).

Some correlations among the independent variables are particularly noteworthy. QL (quality) associated most strongly with DRY (regional wealth), probably reflecting the high quality
private universities located in the East and in California. Quality related also to DPUB (private institutions) and AG (age) in the RUI sample. SA (state appropriations) correlated highly with DPUB and SZ (size); and AL (number of alumni) related positively to the size of the institution. Obviously, large research universities have many alumni, and size is strongly associated with being public.

Table 3 shows that for LAIs the relationships are weaker than those for RUIs. The variable correlating most highly with G (private giving) among the LAIs was QL (institutional quality) (.49). The value, however, is considerably less than for RUIs (.73). Giving is also strongly related to the number of alumni (.40). Alumni are important donors for liberal arts institutions; the value for LAIs is twice as high for the RUIs (.20). DREL (religious affiliation) related negatively to giving in private institutions (-.36). Religious affiliation also related negatively to institutional ratings of quality (-.33). Number of alumni and size correlated positively with LAI quality (.43).

A review of the state income (SY) column shows that SY is obviously correlated with SW (holdings of state wealth holders) (.93) and DRY (wealthy region) (.92). The high correlation with size (.84) suggests the wealthier states have the larger institutions.
A high negative relationship exists between SY and DREL (-.86), indicating that the religious schools are located predominantly in poorer states.

Economic variables were highly intercorrelated; values among DIY (dividend and interest yield in the state), SW (holdings of state wealth holders), SIT (state income tax itemized), and DRY (wealthy regions) were quite high.

Summary of Correlations

In RUIs, giving correlated with

- dividend and interest income (DIY) (.84)
- public institutions (DPUB) (-.83)
- quality (QL) (.73)
- age (AG) (.50)
- state income tax itemized (SIT) (.40)
- state wealth (SW) (.31)
- size (SZ) (-.26)
- alumni (AL) (.20)
- state income (SY) (.19)

DIY, QL, AG, and SIT correlated most highly and positively with giving to institutions of higher education. DPUB had a high negative correlation, indicating that private institutions are more highly associated with giving than are public institutions. Therefore, in a state where there is high dividend and interest income among its residents and where the institutions have a high quality rating and are older than other institutions, greater contributions to higher education will be found.

In LAIs, giving correlated with

- quality (QL) (.49)
- alumni (AL) (.40)
- religious affiliation (DREL) (-.36)
QL and AL positively related to giving in liberal arts institutions. In private colleges and universities quality and alumni are important assets that help attract dollars to institutions of higher education. DREL was negatively associated with giving in liberal arts colleges.

**Regression**

Four models comprised the regression in the cross-sectional analysis. Table 5 summarized the equations used with each model.

**Model I.** Using straightforward least squares estimation, the following estimate was obtained for Model I, the overall contributions model, which examined total voluntary contributions for all institutions. The numbers which precede each variable in the equation are the coefficient estimates, and the parenthesized numbers below these are the t-statistics. For this estimate, G was measured in millions of dollars.

Preliminary Equation (1)

\[
G = -25.52 + .041 AG + .067 QL + 4.64 RRC - .608 RPLIT \\
(-4.35) \\
(3.06) \\
(10.20) \\
(1.58) \\
(-.35)
\]

\[+ .514 RPCH - 15.31 PC - 1.01 PS + .00015 SZ \\
(.16) \\
(-2.51) \\
(-1.01) \\
(1.90)
\]

\[R^2 = .675 \quad SE = 6.67 \quad RSS = 5963.7\]

Preliminary Equation (1) allowed testing for the true coefficients. Later, the measures \( R^2 \), SE, and RSS were used to compare the linear model to other linear models.
Table 5. Equations Used in Cross-Sectional Analysis Regression

<table>
<thead>
<tr>
<th>Equation</th>
<th>Model</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I (Overall)</td>
<td>RUI, LAI</td>
</tr>
<tr>
<td>2</td>
<td>II (Per Alumnus)</td>
<td>RUI, LAI</td>
</tr>
<tr>
<td>1 and 2 compared</td>
<td>Variation of overall, per alumnus</td>
<td>RUI, LAI</td>
</tr>
<tr>
<td>3</td>
<td>III (Economic resource)</td>
<td>RUI, LAI</td>
</tr>
<tr>
<td>4</td>
<td>IV (Eclectic)</td>
<td>RUI, LAI</td>
</tr>
<tr>
<td>4A</td>
<td>Variation of eclectic</td>
<td>RUI</td>
</tr>
<tr>
<td>4B</td>
<td>Variation of eclectic</td>
<td>LAI</td>
</tr>
</tbody>
</table>
to see which better explained total giving. The above equation revealed that besides the constant, only AG (age), QL (quality), and PC (percentage of alumni contributing) were significant at the 95 percent level, because only those have a t-value greater or less than plus or minus 1.96. (Some values less than 1.96 and more than \(-1.96\) are discussed if they approach these values.)

To arrive at the final equation of Model I, a re-estimate of Preliminary Equation (1) excluded the religious affiliation variables, RRC, RPLIT, and RPCH, that were found to be insignificant at the 95 percent level. The small changes in the estimate of the coefficients for the retained variables suggest exclusion of the non-significant variables did not bias the estimates. However, a multi-collinearity test showed that PC (percent contributing) and PS (percent solicited) were collinear. Excluding PS because it was insignificant could lead to biased results; therefore, that variable was reentered into the analysis.

A test of structural homogeneity considered whether there were differences in the model by region of the country, specifically the sunbelt and wealthy regions, and by control (public/private). The final equation had four divisions incorporating institutional and regional control:

1. Public institutions, wealthy regions
2. Private institutions, wealthy regions
3. Public institutions, poor regions
4. Private institutions, poor regions

Equation (1), following, was the final estimate of Model I in which levels of voluntary support, independent of the number of alumni that an institution has on record, were viewed.

Equation (1)  
\[ G = -16.68 + 0.047 \text{QL} + 2.49 \text{PC} - 2.81 \text{PS} \]  
\[ + 0.0014 \text{SZ} - 0.0010 \text{DPUBXSZ} + 0.029 \text{DRYXAG} \]  
\[ - 14.25 \text{DRYXPC} - 0.00019 \text{DRYXSZ} \]  
\[ R^2 = .768 \quad \text{SE} = 5.63 \quad \text{RSS} = 4245.4 \]

In all four divisions, QL (quality) was positively related to support levels of giving. PS (percent solicited) was negatively associated with giving in all regions. AG (age) had no significant effect in the poor regions, and PC (percent contributing) had a negative effect only in wealthy regions. The effect for SZ (size) was greatest for private institutions and in wealthy regions.

**Model II.** Model II was the per alumnus contributions model for all institutions, with G measured in thousands of dollars. Following is a preliminary estimate of Model II.

Preliminary G = 2022.18 - .140 AL - .00031 AGXAL  
\[ (2.23) \quad (-1.44) \quad (2.20) \]  
\[ + 0.0027 \text{QLXAL} - 0.258 \text{RRCXAL} - 0.147 \text{RPLITXAL} \]  
\[ (2.83) \quad (-.89) \quad (-.95) \]  
\[ + 0.083 \text{RPCHXAL} + 0.520 \text{PCXAL} - 0.017 \text{PSXAL} \]  
\[ (.28) \quad (3.74) \quad (-.22) \]  
\[ R^2 = .711 \quad \text{SE} = 6.28 \quad \text{RSS} = 5289.9 \]
Preliminary Equation (2) indicated that the constant, AG (age), QL (quality), and PC (percent contributing) were significant at the 95 percent level when the variables were considered on a per alumnus basis. After an F test indicated the religious variables in Preliminary Equation (2) were jointly insignificant, they were eliminated. The insignificance of AL (number of alumni) and PSXAL (percent solicited X alumni) variables resulted from the multi-collinearity between PC (percent contributing) and PS (percent solicited).

As in Model I, structural homogeneity tests of public versus private and regional wealth distinctions were performed, where wealth was expected to affect only AL (number of alumni), PCXAL (percent contributing X alumni), and PSXAL (percent solicited X alumni) coefficients. In both tests, the structures were found by an F test to be significantly different. Therefore, the model of per alumnus contributions varied significantly between public and private institutions and between wealthy and poor regions.

Equation (2), following, was the final powerful estimate of Model II. It excludes the four variables that showed a t-statistic below one in the structural difference test, the religious variables and percent solicited, explains per alumnus giving for four different groups—wealthy regions for public and private institutions
and poor regions for public and private institutions.

Equation (2) $G = 2588.99 - .809 \text{ AL} - .00053 \text{ AGXAL}$

$\text{(4.46) (6.16) (4.37)}$

$+ .0014 \text{ QLXAL} + .251 \text{ PCXAL} - .290 \text{ PSXAL}$

$\text{(9.76) (2.37) (3.43)}$

$+ .801 \text{ DPUBXAL} - .0011 \text{ DPUBXQLXAL}$

$\text{(5.34) (7.80)}$

$- .232 \text{ DPUBXPSXAL} - .075 \text{ DRYXAL}$

$\text{(-2.41) (-5.98)}$

$R^2 = .870 \quad \text{SE} = 4.23 \quad \text{RSS} = 2378.3$

All variables were significant. AG (age) and PC (percent contributing) were the same for all groups. QL (quality) had a much smaller impact on public institutions. Percent contributing and percent solicited were always positive, and percent solicited had a larger effect for private institutions. Of all the variables, quality had the largest impact on private institutions and percent solicited had a larger effect in private institutions as opposed to public institutions.

A comparison of Equations (1) and (2), which are Models I and II, ascertained which is the better equation for explaining giving. Both models have good explanatory power because the $R^2$ value of both is high; however, Model II has a much lower residual sum of squares and goes farther in explaining variations. Consequently, the variables tested have a greater influence through per alumnus giving than through giving in general.

Model III. An attempt was made in Model III to
consider levels of voluntary support as a function of exogenous institutional variables, variables that do not relate directly to the institution but rather with the setting or environment within which the institution lies.

The estimate of Model III follows, with G measured in thousands of dollars.

\[
\text{Equation (3)} \quad G = 3780.4 - 1.954 \text{ PSY} - 1081.19 \text{ SAXPSY} \\
\quad (4.11) \quad (\text{-1.13}) \quad (\text{-0.24}) \\
\quad + 14.75 \text{ SITXPSY} - .00011 \text{ SPCYXPSY} \\
\quad (2.05) \quad (\text{0.12}) \\
\quad - 1.823 \text{ PSW} + 1174.02 \text{ SAXPSW} \\
\quad (\text{-0.24}) \quad (\text{0.39}) \\
\quad + .0014 \text{ SWHXPSW} \\
\quad (1.87) \\
\quad R^2 = .360 \quad SE = 9.32 \quad RSS = 11,718
\]

Only the constant term and the income tax variable (percent of state income tax returns itemized) were significant. Jointly, the variables were significant in an F test, but the relationship was weak. This analysis yielded a low \(R^2\) value and a high RSS. Therefore, this approach was rejected as a good means of estimating how much voluntary support institutions of higher education raise.

Tested separately were PSY (state income, weighted in millions) and PSW (holdings of wealthy, weighted by enrollment in millions of dollars). The coefficients were jointly significant in an F test \((F = 28.54)\), but the very high RSS indicated that the model has very little explanatory power. An approach which does not weight
state income and wealth by school size was even less successful, indicating that income and wealth alone have no explanatory power.

**Eclectic Model.** Another approach combined Model I and Model II to yield a single eclectic model, Model IV. By combining Equations (1) and (2), Preliminary Equation (4), was produced.

Preliminary \( G = 8083.8 + 6.03 \text{QL} - 213.98 \text{PC} - 8461.98 \text{PS} \)

\[ (1.69) \quad (1.08) \quad (-.04) \quad (-1.91) \]

\( + .917 \text{SZ} - 1.01 \text{DPUBXSZ} + 15.22 \text{DRYXAG} \)

\[ (2.06) \quad (-2.30) \quad (1.47) \]

\( - 5152.4 \text{DRYXPC} + .505 \text{DRYXSZ} -1.105 \text{AL} \)

\[ (-1.10) \quad (2.46) \quad (-6.38) \]

\( - .00066 \text{AGXAL} + .0017 \text{QLXAL} + .209 \text{PCXAL} \)

\[ (-4.67) \quad (9.18) \quad (1.83) \]

\( + .344 \text{PSXAL} + 1.059 \text{DPUBXAL} \)

\[ (3.60) \quad (5.84) \]

\( - .0013 \text{DPUBXQLXAL} - .282 \text{DPUBXPSXAL} \)

\[ (-7.50) \quad (-2.89) \]

\( - .165 \text{DRYXAL} \)

\[ (-4.03) \]

\( R^2 = .896 \quad \text{SE} = 3.90 \quad \text{RSS} = 1898.0 \)

QL (quality), PC (percent contributing), DRYXAG (wealthy/poor region X age), were excluded because they were not significant. Equation (4) was the final estimate of the eclectic model because the elimination of the non-significant variables did not change significantly the power of the equation in explaining levels of voluntary support.
In Equation (4) the breakdowns were by region and by institutional control. The results showed that percent solicited (PS) had a strong negative relationship to total nonalumni giving, while having a consistently positive effect on per alumnus giving. The former result suggests a reverse cause; schools with low overall giving tend to emphasize solicitation to raise needed cash, and these efforts correspondingly work to raise their per alumnus giving. The latter effect, percent solicited (PS), was more than five times stronger among private institutions than among public.

The size of the institution had its stronger effect in private institutions where the effect was positive. The largest magnitude in the four groups was for wealthy regions, private institutions. For public institutions in poor regions, the effect was negative, though slight.
The variables age, quality, and percent contributing made their effects felt only through per alumnus contributions. They did not affect total contributions. Thus, these variables have a significant effect on per alumnus giving only.

Age had a small but negative effect on per alumnus contributions for all groups. Quality had a positive effect across all groups, but the effect was much smaller for public institutions than for private. The negative effect of age may seem unlikely, but it was considered that institutional quality and the number of alumni were controlled for in other variables, and the age variable reflects only the residual effect of age.

Percent contributing and percent solicited were both positively related to per alumnus giving. The effect of solicitation efforts, percent solicited, was greater for private institutions.

RUlIs Separately. To test the eclectic model over time, a separate sample for the year 1972 was used. This test showed that the model had changed. Thus subsequent tests were conducted to determine whether the change was due to RUlIs or LAIs changing. The estimate for the RUlIs using 1972 data, was

Equation (4a) \( G = 7,381 - .675 \, PS + .579 \, SZ - .663 \, DPUBXSZ \)
\[ (\text{.38}) \quad (-.03) \quad (-.69) \quad (-.86) \]
\[ + .072 \, DRYXSZ - .494 \, AL - .00014 \, AGXAL \]
\[ (\text{.18}) \quad (-1.53) \quad (-.69) \]
\[ \begin{align*}
+ & \ 0.00085 \ \text{QLXAL} + 0.135 \ \text{PCXAL} + 0.044 \ \text{PSXAL} \\
& \ (2.64) \quad (0.77) \quad (0.19) \\
+ & \ 0.433 \ \text{DPUBXAL} - 0.00067 \ \text{DPUBXQLXAL} \\
& \ (1.21) \quad (-1.95) \\
- & \ 0.067 \ \text{DPUBXPSXAL} + 0.0046 \ \text{DRYXAL} \\
& \ (-0.34) \quad (0.05)
\end{align*} \]

\[ R^2 = 0.869 \quad \text{SE} = 5.67 \quad \text{RSS} = 770.82 \]

The high \( R^2 \) indicates that the model still has great explanatory power despite the low t-statistics. This may be due to multi-collinearity in the restricted RUI sample. In comparing Equations (4) and (4a), all the coefficient estimates except the DRYXAL (wealthy/poor region alumni) variable have the same sign.

An F test for a restricted sample of RUIs from 1972 to 1977 was run to seek an explanation for a shift from 1972 to 1977 in the overall eclectic model. It was discovered that the structure of the model had not changed for RUIs in the years 1972-1977. A similar comparison for the LAIs indicated a shift of their voluntary contributions patterns. A comparison of Equations (4) and (4A) revealed that age, quality, and solicited efforts became much more important in 1977 in explaining per alumnus giving.

LAIs Separately. The separate estimation of the eclectic model for LAIs in 1977, a reduced form of Equation (4A), only yielded an \( R^2 \) of 0.321 (non-significant variables are not shown). The model has significantly less explanatory power for the LAI than for the RUI institutions.
Equation (4B) 
\[ G = \ldots + 0.00042 \text{QLXAL} + 0.327 \text{PCXAL} + \ldots \]
\[ (1.82) \quad (2.00) \]
\[ R^2 = 0.321 \quad SE = 1.79 \quad RSS = 295.15 \]

By and large, the coefficient estimates were insignificant, small in magnitude, and the opposite in sign from Equation (4). The power of the earlier estimate reflected the larger value of the date for the RUIs. QLXAL (quality X alumni) and PCXAL (percent contributing X alumni) remained significant and positive, but none of the other variables were at all significant. This suggests that ideosyncratic factors may be more important among LAIs and that the model best serves to explain giving among RUIs. As will be discussed in the next chapter, the better explanatory power of the RUI model is to considerable extent a function of the larger amounts received; that is, a major gift will make a relatively greater impact on the voluntary support budget of an institution that receives a small amount.

**Summary of Cross-Sectional Analysis Regression Results**

Table 6 summarizes the significant results of the final equations.

**Model I.** In the overall contributions, the most important variable was QL (quality) (t= 7.83), followed closely by SZ (size) (t=7.63). Also important was the dummy variable for public institutions (DPUB) as it interacts with size although the t-value was negative (-6.93). Three more variables were significant but less powerful in explaining nonalumni support. DRYXAG had a t-value of 2.44, indicating that the age of an institution is important in wealthy regions of the country. DRYXPC (t= -2.37) indicated that in the wealthy regions of the country, the percent of alumni contributing to an institution is negatively associated with nonalumni giving. The final
significant value, DRYXSZ (t = -2.04), suggests that the size of an institution is negatively associated with nonalumni giving in wealthy regions of the country.

Model II. In the per alumnus contributions model, the most powerful variable in explaining voluntary support was QLXAL (t = 9.76). The next important group of variables, DPUBXQLXAL (t = -7.80), indicated that quality associates more closely with giving at private than at public institutions. The third most important variable was AL (t = -6.16). The number of alumni are negatively associated with gifts for institutions. (Recall that private institutions are smaller.) DRYXAL had a negative t-value (-5.98), indicating that per alumnus giving is less in wealthy regions than in poor ones. The fifth most important variable was DPUBXAL (t = 5.34), showing that in public institutions the number of alumni is associated with private giving. AGXAL (t = -4.37) indicates that age as seen through the alumni view is negatively associated with voluntary support. Also significant were PSXAL (t = 3.43), DPUBXPSXAL (t = -2.41), and PCXAL (t = 2.37). Percent solicited had a substantial positive effect in private schools.

Model I and Model II Compared. Final Equations (1) and (2) were compared to identify the better model of Models I and II. Model II had the better explanatory power.

Model III. The economic resources model contained only
Table 6. Summary of Cross-Sectional Analysis Regression Results

<table>
<thead>
<tr>
<th>Final Equations</th>
<th>Institutions</th>
<th>Significant Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RUI and LAI (nonalumni)</td>
<td>constant, QL, SZ, DPUBXSZ, DRYXAG, DRYXPC, DRYXSZ</td>
</tr>
<tr>
<td>2</td>
<td>RUI and LAI (alumni)</td>
<td>constant QLXAL, DPUBXQLXAL, AL, DRYXAL, DPUBXAL, AGXAL, PSXAL, DPUBXPSXAL, PCXAL</td>
</tr>
<tr>
<td>1 and 2 compared</td>
<td>RUI and LAI (nonalumni and alumni)</td>
<td>constant, SITXPSY, model rejected</td>
</tr>
<tr>
<td>3</td>
<td>RUI and LAI (economic resource model)</td>
<td>constant, QLXAL, DPUBXQLXAL, AL, DRYXAL, DPUBXAL, AGXAL, PSXAL, Constant, DPUBX PSXAL, DRYXSZ, DPUBX SZ, SZ, PCXAL</td>
</tr>
<tr>
<td>4</td>
<td>RUI and LAI (eclectic)</td>
<td>constant, QLXAL, DPUBXQLXAL, AL, DRYXAL, DPUBXAL, AGXAL, DRYXAL, PSXAL, Constant, DPUBX PSXAL, DRYXSZ, DPUBX SZ, SZ, PCXAL</td>
</tr>
<tr>
<td>4A</td>
<td>RUI (eclectic)</td>
<td>QLXAL, low t-statistics</td>
</tr>
<tr>
<td>4B</td>
<td>LAI (eclectic)</td>
<td>PCXAL, QLXAL</td>
</tr>
</tbody>
</table>
two significant variables. The most significant was SITXPSY (t = 2.05); the other was SWHXPSW (t = 1.87), indicating that income tax itemization and state wealth correlate positively with voluntary giving. Model III had little explanatory power and was rejected.

Model IV. In the eclectic model, the most powerful variable was QLXAL (t = 11.19). Quality as it interacts with alumni is extremely important in influencing contributions to private giving. DPUBXQLXAL (t = -8.60) was second in strength; but it was negative, indicating that the private institutions are much more strongly associated with quality and alumni than the public institutions. The third most important variable was number of AL (t = -7.28), which had a negative association also. A positive t-value of 6.57 was attributed to the fourth variable DPUBXAL, suggesting that public institutions interacting with the alumni variable are highly correlated with voluntary support to institutions of higher education. The fifth variable of importance was AGXAL (t = -5.29) indicating that age of the institution as seen through the alumni variable is negatively associated with private giving. The sixth variable was also negatively associated with institutional giving, DRYXAL (t = -4.24), indicating that there is less giving per alumnus in the wealthy regions of the country. PSXAL (t = 3.83) indicates that percent of alumni solicited are related to institutional
support. All the other variables were significant, though modestly so; they were SPUBXPSXAL (t = -3.05), DRYXSZ (t = 2.62), and DPUBXSZ (t = -2.54). The dummy for public institutions correlated negatively with percent solicited, indicating that large solicitations are more functional in private institutions. Next, size of an institution positively related to private giving in the wealthy regions of the country. And, finally, since DPUB was negatively related to size, it can be assumed that size is more important in private institutions as it relates to per alumnus private giving. Also PS (t = -2.39), SZ (t = 2.33), and PCXAL (t = 2.01) were all significant variables though less so than the preceding ten. Percent alumni solicited had a negative relationship with giving to institutions, while size had a positive relationship as did percent contributing as seen through the per alumnus model.

Equation (4A). In the Eclectic Model for RUIs separately, the significant variables were only four. First, QLXAL (t = 2.64) indicates that in research institutions, quality on a per alumnus basis is important in decisions to donate funds to institutions of higher education. Second, DPUBXQLXAL (t = -1.95) shows that quality is more closely related to per alumnus giving in private institutions than public ones. AL (t = -1.53) was the third significant variable and was negatively related to voluntary support in public
RUIs. These t-statistics were low, but the model has great explanatory power.

Equation (4B). The eclectic model of LAIs only, Equation (4B), had two significant variables. First, PCXAL ($t = 2.00$) indicates that in liberal arts colleges the percentage of alumni contributing is positively associated with private giving. Second was QLXAL ($t = 1.82$), showing that quality as it interacts with the per alumnus variable in private institutions is positively related to giving.

**Time-Series Analysis Regression**

Table 7 is a summary of the equations used in the time-series analysis regression.

Gross Receipts Model

In a test of Submodel (5), economic activity, as embodies in the variables GNPXY, CDXY, and IDXF, were not significant and were deleted, forming the gross receipts model, Equation (5).

\[
\text{Equation (5)} \quad G = -3.79 + 23.99 \, PY - 0.095 \, SP500XY - 3.57 \, BYXY \\
\quad (-0.50) \quad (5.04) \quad (-5.48) \quad (-3.51) \\
\quad -46.51 \, DXY + 0.156 \, TAXXY - 19.47 \, FS \\
\quad (-4.57) \quad (4.71) \quad (-5.09) \\
\quad + \, 0.080 \, SP500XF + 3.02 \, BYXF + 37.87 \, DXF \\
\quad (5.59) \quad (3.64) \quad (4.67) \\
\quad - \, 0.128 \, TAXXF \\
\quad (-4.76) \\
\]

\[
R^2 = 1.000 \quad SE = 9.20 \quad RSS = 1185.4
\]

All variables were significant except for the constant
term, which served only as an adjustment to force the estimate through the means of the variables. The gross receipts model had high explanatory power. An F-test that was run on Submodel (5) yielded $F = .32$, indicating that the excluded variables were jointly insignificant.

Equation (6) was extracted from the gross receipts model and estimated the share of total contributions by individuals over time. Both economic expectations and the rate of return enter the equation negatively, as does inflation. Government intervention affects giving positively with corporation giving controlled.

Equation (6) $\alpha_{1t} = + 23.99 \text{ PY} - .095 \text{ SP500}_t - 3.57 \text{ BY}_t - 46.51 \text{ D}_t + .156 \text{ TAX}_t$

Equation (7) was extracted from the gross receipts model and was the estimate of shares of total contributions by corporations over time with individual giving controlled. The economic variables were significant and positive, while government intervention (TAX) was significant and negative.

Equation (7) $\alpha_{2t} = -19.47 \text{ FS} + .080 \text{ SP500} + 3.02 \text{ BY} + 37.87 \text{ D} - .128 \text{ TAX}$

Net Receipts Model

The estimate of the net receipts model was

Equation (8) $G = 42.32 - 3.60 \text{ PS} - .027 \text{ GNPXS} - .088 \text{ SP500XS}$

$(3.10) \ (-.38) \ (-.25) \ (-1.02)$
The net receipts model had much less explanatory power than the gross receipts approach as revealed by the significantly higher standard error and residual sum of squares. Thus, the net receipts model was rejected in favor of the gross receipts format.

National Income Model

Submodel (9A) is the equation on which the national income model was constructed.

Submodel (9A) Total G = nNY + p

Equation (9) is the model that, by application, during any year one can calculate the proportion of national income that will be contributed to institutions of higher education.

Equation (9) n = .0054 SP500 + .073 BY + 6.81 CD

- 5.23 D - .0017 TAX - .834

The share of national income given to higher education was positively associated with Standard and Poor's 500 (SP500), high grade bond yield (BY), and the implicit price deflator for the consumption component of GNP.
Table 7. Equations Used in Time-Series Analysis

<table>
<thead>
<tr>
<th>Equation*</th>
<th>Model</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Gross receipts</td>
<td>Estimates the share of contributions by individuals and businesses through the gross receipts of the sectors</td>
</tr>
<tr>
<td>6</td>
<td>Partial Separated from Equation (5)</td>
<td>Determines share of contributions by individuals</td>
</tr>
<tr>
<td>7</td>
<td>Partial Separated from Equation (5)</td>
<td>Determines share of contributions by businesses</td>
</tr>
<tr>
<td>8</td>
<td>Net receipts</td>
<td>Estimates the share of contributions by individuals and businesses through the net receipts of the sectors</td>
</tr>
<tr>
<td>9</td>
<td>National income</td>
<td>Identifies the proportion of income people give to institutions over time.</td>
</tr>
</tbody>
</table>

*Dependent Variable Total Giving (TG); Independent Variables Standard and Poor's 500 (SP500), implicit price deflator for consumption component of GNP (CD), yield on high-grade bonds, average for the year (BY), implicit price deflator (D), government revenues (TAX), personal income (PY), personal savings (PS), business profits (P), final sales (FS).
(CD). It was negatively associated with the implicit price deflator (D) and government tax and nontax revenues (TAX).

Extended Equation (9)

\[ TG = 23.73 + 0.0054 \text{SP500XNY} + 0.073 \text{BYXNY} \]
\[ + 6.81 \text{CDXNY} - 5.23 \text{DXNY} - 0.0017 \text{TAXXNY} \]
\[ + 0.834 \text{NY} \]

\[ R^2 = 0.999 \quad SE = 17.56 \quad RSS = 5551.5 \]

The \( R^2 \) of essentially 1.0 says that the model is accounting for nearly all of the year-to-year variation; however, in time-series analysis very high \( R^2 \)s are common. Equation (9) estimated the proportion of national income contributed to higher education during each time period. All the variables are significant in Equation (9) for total giving because the t-values are above +1.96 or below -1.96.

In Equation (9), the most important value is the Standard and Poor's 500 (SP500), as seen by its large t-value (9.14). Second most important is the high grade bond yield (BY) value, followed by (CD), the implicit price deflator for the consumption component of the GNP. As SP500, BY, and inflation increase, the share of national income being contributed to higher education increases also. Voluntary support of higher education increases with increases in stock equities, bond yields, and the inflationary rate.

The other measures of inflation, however, show a
reverse pattern. When inflation is measured by the GNP inflator (D), which measures general, as opposed to consumer price levels, the relationship is negative. That is, voluntary support of higher education increases, in relative terms, as general inflation decreases. The other two variables in the equation also have negative coefficients. The negative coefficient for the tax variable indicates that as tax collections increase, voluntary support decreases, as would be expected. The final variable is the national income variable.

**Summary of Time-Series Analysis**

**Regression Results**

Table 8 depicts the results of the time-series analysis.

**Gross Receipts Model**

The gross receipts model had good explanatory power and all the variables were significant. The highest positive relationships with giving were Standard and Poor's 500 as it interacted with final sales and personal income, next was tax level followed by the implicit price deflator and bond yield as they interact with personal income, and the implicit price deflator as it interacts with final sales.

Individual giving increases proportionally (as noted by the negative relationships) when SP500, inflation, and bond yields are down and tax collections are up. Business contributions increase proportionally when the SP500, bond yields and inflation are up and when taxes are lower.
Net Receipts Model

In the net receipts model, the only significant variable is the constant term. By comparison to the gross receipts model the net receipts model has little explanatory power. Its standard error and residual sum of squares are much higher than those in the gross receipts model, diluting its power and leading to its rejection in favor of the gross receipts model.

Table 8. Summary of Time-Series Analysis Regression Results

<table>
<thead>
<tr>
<th>Model</th>
<th>Final Equation</th>
<th>Significant Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross receipts</td>
<td>5</td>
<td>PY, SP500XY, BYXY, DXY, TAXXY, FS, SP500XF, BYXF, DXF, TAXXF</td>
</tr>
<tr>
<td>Individual G</td>
<td>6</td>
<td>PY, SP500XY, BYXY, DXY, TAXXY</td>
</tr>
<tr>
<td>Business G</td>
<td>7</td>
<td>FS, SP500XF, BYXF, DXF, TAXXF</td>
</tr>
<tr>
<td>Net receipts</td>
<td>8</td>
<td>Only the constant term</td>
</tr>
<tr>
<td>National income</td>
<td>9</td>
<td>SP500XNY, BYXNY, CDXNY, DXNY, TAXXNY, NY</td>
</tr>
</tbody>
</table>

National Income Model

The variables in Equation (9) were all significant. The variable with the most power was \( SP500XNY \ (t = 9.14) \), indicating a high positive relationship between stock price closings, national income, and total giving to institutions of higher education. The second most important variable was \( BYXNY \ (t = 5.57) \), which shows a high positive
relationship between bond yields, national income, and private giving. The third most important was CDXNY (t = 4.70), which indicates the consumption component of the gross national product and national income are positively associated with total giving to institutions of higher education in the state. These three variables, stock prices, bond yields, and the consumption component of the GNP as they interact with national income, are strongly associated with total giving.

The three variables negatively related to private giving were NY (t = -3.71), DXNY (t = -3.67), and TAXXNY (t = -3.50). National income and the implicit price deflator, as it interacts with national income, and government taxation, as it interacts with national income, affect private giving to institutions negatively.
CHAPTER 5
SUMMARY, DISCUSSION, AND IMPLICATIONS

Recent proportional decline in resources to higher education makes growth in voluntary support a critical requirement. The purpose of this study was to identify factors that account for variations in levels of voluntary support to United States colleges and universities and to specify the relative importance of each factor. This chapter contains brief summaries of the background of the study, the literature reviewed, the method, and the findings, followed by a discussion of the findings and the implications that can be drawn from them.

Summary

Although government has been a primary provider of funds to higher education in the United States, it has only rarely exerted control over other sources of support sought by institutions. As a result, a high degree of competitiveness for donations exists between colleges and universities. The competition will become even more intense as government budget cuts force institutions to use their discretionary funding, which now consists heavily of voluntary support, to balance their budgets. Although voluntary support has increased annually,
the rate of increase has been unstable, and over the years budget shares from voluntary support and adjusted dollars per student have fluctuated widely. Changes in tax regulations in 1981 in the standard deduction may further erode gains in voluntary support. Today fewer persons itemize deductions as compared to 10 years ago; therefore, the incentive of the charitable deduction has narrowed significantly.

The Literature

A number of studies have investigated factors influencing voluntary support. Hunter (1968) and Ireland (1969) used surveys and opinionnaires to discern motivations for giving. They concluded that donors give to causes from which they benefit personally or in which they are personally involved, and to causes that the donors deem worthy.

Other researchers used existing data to form mathematical estimations as predictors of motives for giving. Hochman and Rodgers (1973) concluded that utility interdependence was an explanation of giving. Taussig (1966), Schwartz (1967), Feldstein (1975), and McNees (1973) focused on the incentive of the charitable deduction. While Taussig discounted the incentive effect, Schwartz and Feldstein concluded that contributions were increased by the tax provision of deductibility. McNees, in his study of charitable bequests, presented arguments for
tax credits rather than deductions.

Nelson (1970) and Cushman (1979) studies factors influencing corporate and charitable donations. Nelson found that tax rate changes were significant in explaining giving variations and that the larger a corporation the greater the percentage of its income given. Cushman found that assets, income, the salary of the foundation officers, and high corporate rates of return were positively related to giving. A high concentration of foundation assets in corporate stock was negatively related to private giving.

Pickett (1977), in determining the fund-raising effectiveness of universities, stated that the percent of fund-raising potential actually raised was the best measure of effectiveness. Because the largest, wealthiest, highest quality institutions have greater access to wealth, they will naturally attract the most funds. Pickett attributed fund-raising effectiveness of colleges to superiority in three areas: trustee leadership, sense of institutional direction, and investment in the advancement function.

Method

Cross-Sectional Analysis. A cross-sectional analysis of contributions to colleges and universities in 1977-78 identified factors accounting for variations in levels of support to 41 RUIs and 102 LAIs. In several analyses
the dependent variable (G) was measured in millions or thousands of dollars. Twelve independent variables were correlated with G.

The correlations for the LAIs were considerably lower than the correlations for the RUIs. The value correlating most highly with giving (G) for the LAIs was institutional quality, followed by the number of alumni and religious affiliation (negative). All correlations were less than .50.

Four models were used in cross-sectional regression analysis: Model I, the overall contributions model; Model II, the per alumnus contributions model; Model III, the economic resources model; and Model IV, the eclectic model. In the overall contributions approach, Model I, it was assumed that voluntary contributions are best explained through a component unrelated to number of alumni. Model II, the per alumnus contributions approach, assumed that voluntary contributions are best viewed through average contributions per alumnus.

In comparisons of Model I and Model II, each had good explanatory power. The structure of Model I depended greatly on whether an institution was in a wealthy or a poor region, while Model II depended upon public versus private affiliation.

The $R^2$ measure in Model II was higher than that of Model I, indicating that the per alumnus contributions
model explained a greater proportion of the total variation of G than the nonalumni contributions model. Furthermore, the lower standard error (SE) and residual sum of squares (RSS) measures of Model II represent a better "goodness of fit" and thus better explanatory power.

Twenty-two independent variables were tested using regression analysis. Five were found to make no significant contribution to the prediction of G; all others were used in one or more of four theoretical models constructed to determine the best estimate of variations of levels of voluntary support. Least squares estimation was the method of analysis used.

Time-Series Analysis. Regression analysis was used to identify factors accounting for variations in levels of giving to higher education over time. The dependent variable was total giving (TG) to higher education institutions in the years 1932-1974. The independent variables were related to the national economy, the gross national product, business profits, personal income and taxation. Several models were created, two estimated the share of contribution made by business and individuals; one by using gross receipts of the public/private sectors, the other by using the net receipts of the two sectors. The last model estimated the share of national income given to higher education. Regression was the method used.
Findings

Cross-Sectional Analysis. Correlation results showed that among RUIs the most significant, positive variable correlating with Giving was dividend and interest income in the state in which the institution is located, followed very closely by being privately as opposed to publicly controlled. Other variables that correlated positively with G were, in order, institutional quality, age of the institution, and percent of in-state persons itemizing deductions on their federal income taxes.

Since Model II better explains G, one can say that voluntary contributions are best analyzed on a per alumnus basis. Qualitative factors and fund-raising efforts consequently have a greater influence through alumni giving than through giving in general.

The economic resources approach, Model III, attempted to test whether voluntary contributions may be better explained by the economic resources of the state in which the institution is located, specifically by state income and state wealth variables. Model III displayed a low $R^2$ and a high residual sum of squares. State income and wealth did not explain cross-sectional variations in giving well so Model III was rejected in favor of the other approaches.

The eclectic model, Model IV, combined the approaches of Models I and II, and separated the sample into the RUIs and LAIs. For the RUIs, the model predicted private
giving quite well, but the LAIs model explained voluntary support poorly.

**Discussion and Implications**

This study postulated a conceptual framework that was used more as a point of departure than as a predictor of voluntary support behavior. Therefore, no explicit effort was made to test the framework. Nevertheless, one may observe that the findings were consistent with the framework. Individuals, corporate or private, do perceive certain (disparate) utilities in making voluntary support decisions. Individuals, for example, do appear to give when they perceive institutional need. Undoubtedly, they gain both a psychological and indirectly a tangible benefit from these gifts. Corporations, too, gain particular albeit different utilities from their contributions to colleges and universities, as noted.

**Cross-Sectional Analysis**

The correlation analysis shows and the subsequent regression confirms that quality is a potent predictor of levels of voluntary support to selected American colleges and universities. (Another study recently completed by Nancy Walker shows that the pattern does not hold for less-selective liberal arts colleges) *(Analysis of Enrollment Changes and the Variables That Affect the Changes in Liberal Arts Colleges, Walker 1982).* In private giving to LAIs and RUIs money follows success; givers are most likely to donate to those institutions that are already successful.
Among the variables that explain private giving to LAI and RUI institutions, quality is the primary one that can be directly enhanced. From the correlations the conclusion can be drawn that if an institution (LAI or RUI) does not have, or cannot gain, a high-quality rating, it may be hard pressed to raise the kinds of funds for which it is searching. Development officers and administrators will have to aim the institution's future growth toward favorable ratings of quality; otherwise, they will be forced to resort to extraordinary means for raising money.

Of course, it may take decades to raise ratings of institutional quality. It takes money, influence and power as well as the dedication of the administrators and faculty. A comparative rating of quality is a very difficult item to change since it depends on many uncontrollable factors.

For the LAIs, two other important characteristics are the percent of alumni who contribute and the lack of religious affiliation. Presumably, high quality solicitation efforts yield a greater likelihood of contribution, yet percent contributing and quality ratings interact. A college with a high Gourman rating of quality is one with which alumni would wish to identify and support as a means of maintaining school ties. More surprising is the apparent implication that LAI institutions would gain more funds if they were nonreligious. Religious organizations receive by far the greatest amount of private giving in the United States, but apparently those funds do not overflow importantly to religious educational institutions. Of course,
these are static conclusions, and one could not conclude that fund raising at a given institution would be more successful if religious ties were cut.

For RUI institutions the two most important characteristics, after a rating, of quality, are location in a state where the residents are more likely to itemize their tax deductions and the age of the institution—neither being "decision" variables. The deductibility characteristic confirms earlier reports that the cost of giving may influence a donor's decision to support higher education.

The age characteristic may be associated with donors equating age with prestige—older is better—or it may reflect that an older institution has had the opportunity of time to build a rating of high quality. Age certainly provides a larger body of alumni as a fund resource. Yet, the regression analysis has held these variables constant. Their age contributes something to giving in addition to its interaction with these other variables.

Comparison of the four cross-sectional models provides clear implications for development officers, based on giving practices of alumni and nonalumni of RUI and LAI institutions. When nonalumni contribute to higher education, they are more likely to choose to endow large, private institutions with high quality ratings and in wealthy regions, non alumni give to those institutions that are oldest. Alumni also prefer to contribute to private institutions with high ratings of quality; however, alumni seem to disregard age as an inducement to giving. In wealthy regions, alumni give to the larger insti-
tutions; but alumni giving has the greatest importance in poor regions.

When making appeals to nonalumni, the request should stress the appropriate characteristics of the institution that emphasize its quality rating and size, for example, the number of national merit scholars enrolled and the number of Ph.D or Master's degrees awarded or the number of graduate students enrolled.

In attracting funds, RUI institutions have the biggest challenge. $R^2$ values for the RUIs are relatively high. Thus, giving to major research institutions seems to have less room for special development; the institutions appear to receive by systematic means about as much as they can expect to receive. Yet, RUIs receive large amounts; therefore, a model that predicts 70 percent of giving on a $10 million dollar basis leaves $3 million to be explained by nonsystematic means. For the LAIs, $R^2$ value may be much lower but so are dollars raised.

In selective liberal arts colleges nonsystematic factors appear to be at work, as voluntary support shows relatively small relationship to size, age, or the other variables. The greatest portion of the variations in LAI's voluntary support ($R^2$ values are small) are due to ideosyncratic factors or variables that could not be hypothesized a priori.

It should be recognized, however, that the comments in the two paragraphs above are relative comments. That is, because Research Universities raise tens of millions of dollars and Liberal Arts colleges typically raise only one or two million
dollars. A single large gift in the later institutional category will have a much larger effect on the statistical model, giving the impression that special efforts and ideosyncratic factors have their impact in relative rather than absolute dollar terms. Put another way, a million dollar special gift will appear small in a twenty or forty million dollar fund-raising effort and large in a one or two million dollar effort.

Apparently LAI institutions develop their own successful, unique environmental strategies for collecting funds. This suggests that there is room in LAIs for creative fund raising ideas and execution of techniques endogenous to the institution, that will give a development officer the opportunity to make a significant contribution and difference.

To continue to attract funds, private institutions need to develop and maintain a high quality rating and a strong alumni program. In appealing to their alumni, large private institutions in wealthy regions may desire to stress their size, but not their age. There are many possible manifestations of these variables and thus many ways to stress or "play down."

Public institutions must also depend on alumni and emphasize their quality in gaining funds. The quality rating is especially critical, and public institutions should seek to enhance their quality while emphasizing their quality features. Every institution has such accomplishments to stress.

In less wealthy regions, both public and private institutions should upgrade their alumni solicitation programs. Although the
economic resource model was rejected as inferior to other models, it did show that a proportion of income taxes itemized by taxpayers and state income were significant.

Emphasis on the tax deductible nature of gifts to colleges and universities thus can be productive. Tax law changes allowing charitable deductions even for those who do not itemize, should prove fruitful and ought to be publicized.
Time-Series Analysis

Voluntary contributions to higher education institutions include gifts, sponsored research, and other programs. Over time, private individuals and business enterprises give a portion of their income to colleges and universities. This study tested the hypothesis that this portion varies with the level of economic activity, anticipated business conditions, the rate of return on other investments (which measure the opportunity cost of giving), the prices of goods bought by the groups as well as the general price level and the amount of government intervention in the economy. The view taken was that economic agents do not consider voluntary contributions as expenditures of secondary importance, but rather place giving alongside consumption and business expenses as matters of primary importance.

The analysis indicated very different motives for giving between business firms and individuals. It is hypothesized that individuals are stimulated to give to colleges when institutions' financial health is poor. Individual giving patterns regarding inflation and taxes can be explained by observing that giving declines as inflation rates climb and as taxes owed rise. Inflation reduces giving as expected, but government intervention (taxes) has a positive effect, possibly because higher taxes induce individuals to give more as a tax shield.
But, as business conditions and rates of return on investment decline giving increases. This makes no economic sense. It is believed that difficult financial conditions in society signal difficult times for institutions resulting in increased giving.

The pattern is reversed for nonalumni groups, such as businesses. Improving business conditions, as reflected in stock prices, stimulate business contributions. The positive effect of the rate of return on bonds violates the assumption that economic factors uniformly affect giving to higher education, but the bond yield can be viewed as a cost-of-capital variable for the firm. Thus increasing bond yields raise the price of capital and lower the opportunity cost of giving. Inflation may have an impact similar to rising bond yields, making voluntary contributions relatively cheaper for business.

Business firms appear to act on traditional economic grounds by donating to colleges when business and economic activity are high. Inflation seems to increase levels of giving whereas high tax collections seem to have the reverse effect. Perhaps inflation is seen as reducing the cost of giving (the value of the gift is inflated) and the tax finding may reflect the depressing effect of government taxation on business conditions.

The time-series analysis suggests that development officers should solicit corporations and other nonalumni
most conscientiously when the cost of giving is down. The economic indicators used in this analysis should be monitored regularly by development officers to determine the right economic timing for donations, as this could be crucial.

Individuals, on the other hand, should be advised as to the financial needs of the institutions. Indeed, giving by alumni may be expected to be relatively greater when the economy is poor and the perception of need by collegiate institutions is high.

Several observations can be made about needed additional research. First, there remains much that can be done disentangling the variables that affect giving and the best strategies to use with various clientele: alumni and the various non-alumni. Additional data should be sought and tested, particularly data for variables not tested here. For example, the low \( R^2 \) value for the LAIs suggests that the quality of the fund raising office should be appraised and its contribution to levels of support analyzed. Specifically, data for the variables indentified by Pickett should be collected and analyzed for the sample utilized herein. It is the author's sense that the variables analyzed herein provide a good base, but that subsequent work needs to look at more of the decision variables, such as the various strategies that are taken in raising funds. This, of course, involves a major data gathering
Additionally, comprehensive universities and colleges II and LA IIs institutions would benefit from a similar study; funding does not come as easily for these institutions. LA IIs would especially benefit since, as learned from this study, liberal arts institutions have a greater potential for creativity and individual effect than comprehensive universities and colleges II. Further, the LA IIs are in the most difficult financial straits and their future is not bright.

A comparative study on private giving to higher education embracing the years preceding the presidency of Ronald Reagan, during it, and perhaps following it, would be interesting in assessing the effects of the Reagan administration's policy of relying more heavily on the private sector for gifts.

Another study could investigate why the forces that yield dollars to religion and religious organizations appear to fail to apply equally to religious schools. American higher education was founded on religious grounds with financial religious support. How can these findings be verified and if true, how can these forces be regenerated?
REFERENCES


