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AUTHOR Dickmeyer, Nathan
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ABSTRACT

Indicators of the financial health of colleges and universities are considered, along with causes of financial problems, a conceptual framework for institutional financial flows, and data sources. Five indicators are addressed: changes in institutional distress potential for private colleges, changes in institutional financial resources, changes in academic emphasis, changes in the extent of academic opportunity, and needs for more financial resources. Primary causes of financial distress are inefficiency and a suboptimal market segment. An institution's educational market segment affects its finances because of factors such as: (1) student demand for a college with certain programs, costs, and location; (2) the supply of competing educational institutions, and (3) the economies of operating in any particular educational market segment. The conceptual framework considers whether the institution has a favorable market segment and operating efficiency, along with inflows (e.g., tuition, appropriations, financial aid to students) and outflows (e.g., expenditures, students leaving the college). To develop indicators of financial health, the main focus is financial data from the Higher Education General Information Survey, with secondary attention to enrollments, degrees conferred, institutional characteristics, and faculty data. (SW)

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Technical Report No. 12

Concepts Related to Indicators of College and University Financial Health

Nathan Dickmeyer

Prepared by

SAGE
STATISTICAL ANALYSIS GROUP IN EDUCATION

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TECHNICAL REPORT NO. 12

CONCEPTS RELATED TO INDICATORS OF COLLEGE AND UNIVERSITY FINANCIAL HEALTH

Nathan Dickmeyer
American Council on Education

Statistical Analysis Group in Education
American Institutes for Research
P.O. Box 1113
Palo Alto, California 94302

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Introduction

Although interest in assessing the financial health of postsecondary educational institutions has been expressed for decades, the past three years have brought dramatic expansion of this interest. Policymakers in Congress, in the Education Department, and in the states have indicated their concern about financial health, especially regarding those institutions for which they bear some fiscal responsibility.

Faced with the twin realities of declining populations in the traditional college-age cohorts and spiraling inflation that can affect educational institutions even more adversely than it affects the general population, colleges and universities have not been hesitant to seek out more extensive support, both from the government and from private donors. Moreover, improved financial planning and management and increased public and private support lead the agendas of most institutional officers and their interest groups in state capitals and in Washington. Research in the area of financial health indicators is thus extremely relevant and timely.

Yet, at the same time, individual institutions are reluctant to be labeled "in distress." Such a label can quickly become self-fulfilling. Prospective students may turn elsewhere for their education, leading to accelerating enrollment declines. Prospective donors may hesitate to "throw good money after bad," leading to accelerating financial deficits. Obviously, research in the area of financial health indicators must be conducted with sensitivity to the effects of the research on institutions of higher education.

Finally, past research in the area of financial health indicators has demonstrated some of the significant technical difficulties involved.

Brubaker (1979) reviewed over 40 studies conducted since 1973. He concluded that (1) the intended uses of the indicators determined which indicators were preferred; (2) although many past efforts have foundered because of the lack of suitable conceptual frameworks by which indicators can be validated, such frameworks are now becoming more widely available; and (3) while there have been problems, data sources from which to derive indicators are improving along with efforts to use the data, and NCES's HEGIS data bank is now the best and most comprehensive source for current research aimed at the universe of postsecondary institutions. We will discuss each of these three technical problem areas--uses for the indicators, a conceptual framework, and data sources--prior to recommending specific indicators of college and university financial health.

Uses for the Indicators

Financial health indicators for higher education institutions have distinctly different uses. From an institutional perspective, they can assist in making internal management decisions, indicating areas of relative strength and weakness and even suggesting possible remedial strategies (see Dickmeyer & Hughes, 1979). From a financial donor's or lender's perspective, they can provide roughly the same information, but with the indicated decision being one of granting, tempering, or withholding aid. From a more global perspective, financial indicators can help state officials concerned with higher education identify institutions that are especially healthy or unhealthy. Decision options include various financial support strategies, program reviews, and even discontinuation of operations. These are all complicated uses, intertwined with matters of economics, politics, social policy, and sometimes even religion. Indicator data are generally just one source of information to help complete a larger picture (see Coldren, 1979).

A broader perspective is required, however, if financial indicators developed by NCES are to be useful for informing federal policy decisions regarding higher education in America. While we have not conducted a systematic assessment of major federal policy issues in this area, we can confidently predict they will include the following question: Are certain

higher education sectors becoming progressively weaker financially?* The answer to this question has implications for various decisions regarding federal assistance to higher education, especially those related to the Higher Education Act (HEA) Titles III (aid to developing institutions), IV (student assistance), VII (construction and renovation of facilities), and X (community colleges).

Given the current demographic trends (i.e., declining "traditional" college-age cohorts, including veterans assisted under the G.I. Bill) and economic realities (i.e., high inflation), it is clear that (1) overall college attendance will decline throughout the 1980s and (2) some institutions will suffer this decline more than others. Analysts are slowly sketching out the pattern of decline and are finding that there will be regions of the country with net declines in potential students due to lower than average fertility, low in-migration, and high out-migration, and regions with some potential growth. Although some highly selective institutions are faced with a greater admissions demand than they can satisfy and thus will not be noticeably affected by a decline in number of applicants, many others will have to adjust to reduced demand by trimming their fixed costs and streamlining their academic programs. Some institutions will close, some will have to drop programs still in demand, and others will be unable to respond to changing student needs due to the general thinness of their resource base.

Behind all these projections looms the legislative issue: Should Congress take steps to protect institutions faced with demise, cutbacks, or an inability to respond to student needs? If the only danger were to the institutions themselves, then the likely response would be no. But postsecondary institutions serve many needs within their regions and

* A report of issues in postsecondary education prepared by the Educational Testing Service for NCES in 1978 noted that issues of financial health of institutions were ranked ninth out of 67 issue areas in terms of importance. A Federal Interagency Committee on Education report in 1978 aimed at formulating a comprehensive federal education policy noted that "there is substantial evidence that many institutions are experiencing marked financial constraints as indicated by reduced programs, less construction and maintenance activity, and changes in faculty structure."

states: they develop and refine the earning and citizenship skills of their students, and they add to the economy of the area. Even if the concern of Congress does not extend to the problems of random locations that just happen to be served by troubled institutions, concern might be greater if the pattern of closings and program cutbacks were not random.

In fact, it seems highly likely that certain groups of students in certain areas may see their opportunities for higher education restricted. To evaluate the severity of this problem, Congress needs to know whether the schools traditionally attended by minorities or urban poor, for example, are the ones that are going to see the greatest decline. Will opportunities for minorities or the economically disadvantaged remain the same, or are the schools that traditionally serve these groups in the greatest danger? More importantly, what is the future likely to hold, given various assumptions about currently observable trends? Providing information to address such questions will be an important use of indicators developed by NCES.

Concepts Related to College and University Financial Indicators

Institutions of higher education exist in an economic environment. They compete for resources and they compete for "customers." The remuneration they receive for services must be adequate for them to remain viable. If the remuneration is inadequate, they must change their services or go out of business. The necessary balance between academic goals and economic constraints is complex and not easy to maintain or analyze. The following background section will begin this analysis by describing the character of the economic constraints in terms of a system of institutions competing for limited resources and limited numbers of students.

Given that we are interested in determining the "adequacy of remuneration," we could use "consequence-oriented" measures of adequacy and look for institutions that have changed services or gone out of business--consequences of low remuneration. While this style of analysis has some appeal, especially if an agreeable working definition of "services" can be found, we may learn little about the structure and causes of financial

stress. Too many other factors cause changes in services or demise. One college president has declared that the only cause of demise is a "failure of will." The failure-of-will analysis may tell us something about the pervasiveness of economic pressures on institutions, but perhaps little else about the true causes of institutional financial distress.

An alternative approach requires the analysis of financially related causes of institutional economic distress, distress being the result of inadequate remuneration for services. A major premise of this section is that adequacy of remuneration results from efficient operations (a minimum of financial inflows for a maximum of service) and being in an optimal educational market segment. That is, major causes of financial distress are (1) inefficiency and (2) finding oneself in a suboptimal market segment.

Efficiency

Although the problem of efficiency is conceptually simple, operationalizing the concept into a set of definitions that can be agreed upon and measured approaches the impossible. Two institutions with identical "products" (in terms of taking virtually identical students and educating them equivalently) can differ radically in the costs necessary to do these identical tasks. Faculty costs may differ for historical reasons. Staff costs may differ because of local wage-scale differences. Operations costs may differ because of differences in management styles. The difficulty of measuring costs, however, pales in comparison to the difficulty of finding two identical institutions in terms of product. It is, perhaps, even more difficult to agree on some comparative basis (such as FTEs) in order to produce comparable unit costs for two distinct insti- tutions.

Educational Market Segment

We have a great deal of flexibility in the way in which we define educational market segments. Higher education has a number of "customers," including students, the federal government, state governments, and philanthropists, each of whom might define the market structure differently. Since the primary consumers are the students, however, the definition of a

market segm may be best accomplished from their point of view. Hence, an institution's market segment (the other institutions with which it is in competition) will be determined by the institution's academic program structure, nonacademic emphasis, and location. Program structure refers to the academic degree programs offered as well as the reputed quality of the institution. Nonacademic emphasis refers to the campus religious orientation, mixture of sexes, residential character, and other reputational and "atmosphere" characteristics. Location of the institution varies in importance for determining the market segment to which an institution belongs. Its importance depends on the community orientation of the institution and the bias of subsidies for state residents.

Some educational market segments consist of institutions that compete strongly with each other, and some consist of institutions that compete very little. The degree of competition is determined by the number of potential students who perceive any two institutions as roughly equivalent options. Thus, each market segment can be defined either from the perspective of a single institution as the set of all institutions with some equivalence to the focal institution from the student's perspective; or, from a broader viewpoint, a market segment may be defined as a group of institutions that share the "equivalence perception" of a certain minimum proportion of applying students. In either case, market segments are overlapping and will tend to vary over time.

One critical factor in how an institution's market segment affects its financial condition is the demand within that segment, that is, how many students would attend an institution with a certain combination of programs, nonacademic offerings, price, and location. How much "subsidy" is available to such an institution is also important. Clearly, overall demand is largely a function of the size of the appropriate age groups and of the rate of higher education participation. Each institution tends to appeal to certain fractions of each age category of students depending on its programs, costs, and location. (In some states, Ohio for example, this concept of market-demand has been refined to include considerations of participation rate by occupation type or parent's occupation type, as appropriate.)

A second important factor is the degree of competition or total supply of competing educational institutions. How many institutions (and thus how many freshman or transfer slots) are competing for the purveyors of demand--the students (or the federal dollars or the state dollars, depending on our reference point)? Certain segments enjoy a virtual monopoly on the demand. If the market segment is defined in terms of student perceptions, as manifested by student applications, and if the students attending the institution have selected that institution without considering any alternatives to be suitable, the institution enjoys a monopoly. Community colleges, for example, in which attending students rarely apply elsewhere must be designated as alone in their market segment. When the market segment has many more freshman slots than interested freshmen, then that segment should be regarded as tending to be economically disadvantageous.

The final important factor relates to the economies of operating in any particular educational market segment. There are two multi-dimensioned economies: economies of scale and economies related to services. There are some fixed costs associated with each institution. Thus, certain enrollment sizes provide the opportunity for more efficient operation. But the actual enrollment size depends on the institution's market segment. Some segments have more available students and fewer competitors. Community colleges, in many cases, have developed market segments where the supply of students is very large and competitors nil.

Choice of market segments also implies a set of costs for the services involved with operating in that segment. Institutions seeking to enroll students who are underprepared for college face the extra costs of remedial services. Institutions seeking to attract the most able students may have to pay more for experienced faculty with many other occupational opportunities.

Success for any individual institution depends on finding (or more passively, finding oneself in) a segment of the educational market where competition is at a minimum, costs are at a minimum, demand is at a maximum, and hence, revenues are at a maximum. Many market segments are very unrewarding. There may be too much competition, the cost may be too

high to operate, or the demand may be so low that little revenue can be generated.

Some market segments have been made more rewarding through special subsidies. Appropriations, student aid, and specific programs like aid to developing institutions have substantially altered the economic reward structure of the education market in the last 20 years. Serving the poor, serving minority students, providing vocationally oriented education, and providing decentralized "community college" education have all become more rewarding due to public subsidy. This is the choice that indicators of financial health will present to the federal and state governments: if certain educational market segments are found to be composed of institutions in financial distress, should the reward structure of some of those segments be altered through various kinds of targeted subsidies?

Profit Sector Market Analysis

Analysis of the financial health of educational institutions has certain parallels with profit sector market analysis. Let us pursue this analogy. We should first seek to measure what the institution "produces." An examination of its location, program offerings, and nonfinancial advantages will begin to tell us about its market. We should then ask about its sales. What is its enrollment? How much does it receive in revenues? More importantly, what is its market share? How is it faring with regard to its competitors? We will want also to evaluate its profitability: in this case, its efficiency. For some standard unit of output, what is the cost?

Finally, given our analogy, we would like to know its profit. Is it succeeding well enough in the market to make a profit? The reader is undoubtedly exclaiming at this point that we are dealing with the nonprofit sector! Rather than seek a "profit" statistic in the nonprofit sector, I propose we examine profit itself more carefully. Profit in the "for profit" sector is important because it provides the opportunity for greater investment and greater rewards to investors (dividends). However, profit is not the pure residual of revenues after costs. Certain costs tend to increase as performance improves, notably management salaries and

taxes. Profits are to a large extent manipulable by management decisions aoout the level of certain costs. Thus, even in industry, the profit figure cannot be relied on for the sole evidence of financial health. One must also watch sales, market share, and efficiency. High profits are, in general, however, the best indicator of management's assessment of the success of the organization. The salary of the president may be another excellent indicator.

To find a parallel in the nonprofit sector, we must find the behaviors that institutions in good financial condition exhibit. The answer is straightforward, though without the elegance of the profit sector's single item response. Colleges and universities operating efficiently in a financially rewarding market sector increase their financial reserves, increase their endowments, build new buildings, renovate old buildings, increase faculty salaries, increase staff salaries, and spend more for nonpersonnel items.

Each of these behaviors can be measured. Like the profit indicator, however, these indicators are flawed. Institutions do not always behave in the ways indicated. Some institutions in good financial condition have been known to simply turn away revenues (by sending back gifts or more commonly by holding tuition down). Other institutions have used successful operation in one market segment to temporarily build resources to allow entry into another market segment. For example, a successful nonselective institution may become selective. The costs of denying admission to low scoring applicants may have a negative financial impact yet be the result of success within the previous market segment. Thus, measures of "successful behavior" may show only "poor health," because of the institution's investment of the "profit." These indicators are also flawed because of the lack of standardization for many of them. Building renovation needs are an example of a measure of success for which no standard exists.

Fortunately, it may not be necessary to measure all possible symptoms of health to arrive at a reasonable estimate of trends within any sector of interest in higher education. Certain measures have sufficient intrinsic value to be worth tracking. For example, a measure of financial

reserves is proposed below to be important not only because an increase in financial reserves generally accompanies successful operation but also because reserves are necessary for the institution to protect itself against unexpected costs or revenue losses. Reserves have an intrinsic financial condition value. Changes in average faculty salary is a similar indicator. Failure to increase faculty salaries at a rate equal to inflation, for example, is a common response to financial difficulties. This failure can decrease the ability of the institution to compete effectively in the market, both for competent faculty and for students.

Institutional Financial and Nonfinancial Flows

The subject of financial indicators in higher education has been widely studied. A project of this small magnitude cannot hope to break much new ground in the area, but we will try to integrate the work of many past researchers into a preliminary conceptual framework of institutional financial and nonfinancial flows. With this conceptual framework as a reference, it will be possible to derive a tentative set of indicators, again using the work of others.

Figure 1 describes the flow and build-up of financial and nonfinancial resources in an institution. Strictly speaking, a resource represents an accumulation of something--it is a "stock." Resources can only be built up when the inflow of funds and services exceeds the outflow. Resources available for use within the institution decline in amount when the outflow exceeds the inflow.

The framework we have expressed thus far rests on the assumption that an institution in a favorable market segment and operating reasonably efficiently will have slightly higher inflows than outflows and thus will be able to build up its stock of resources. For most institutions, the majority of inflows are related to the number of students: tuition, appropriations, and financial aid to students. The outflows are salaries and other expenses. The resources that are built up include the physical

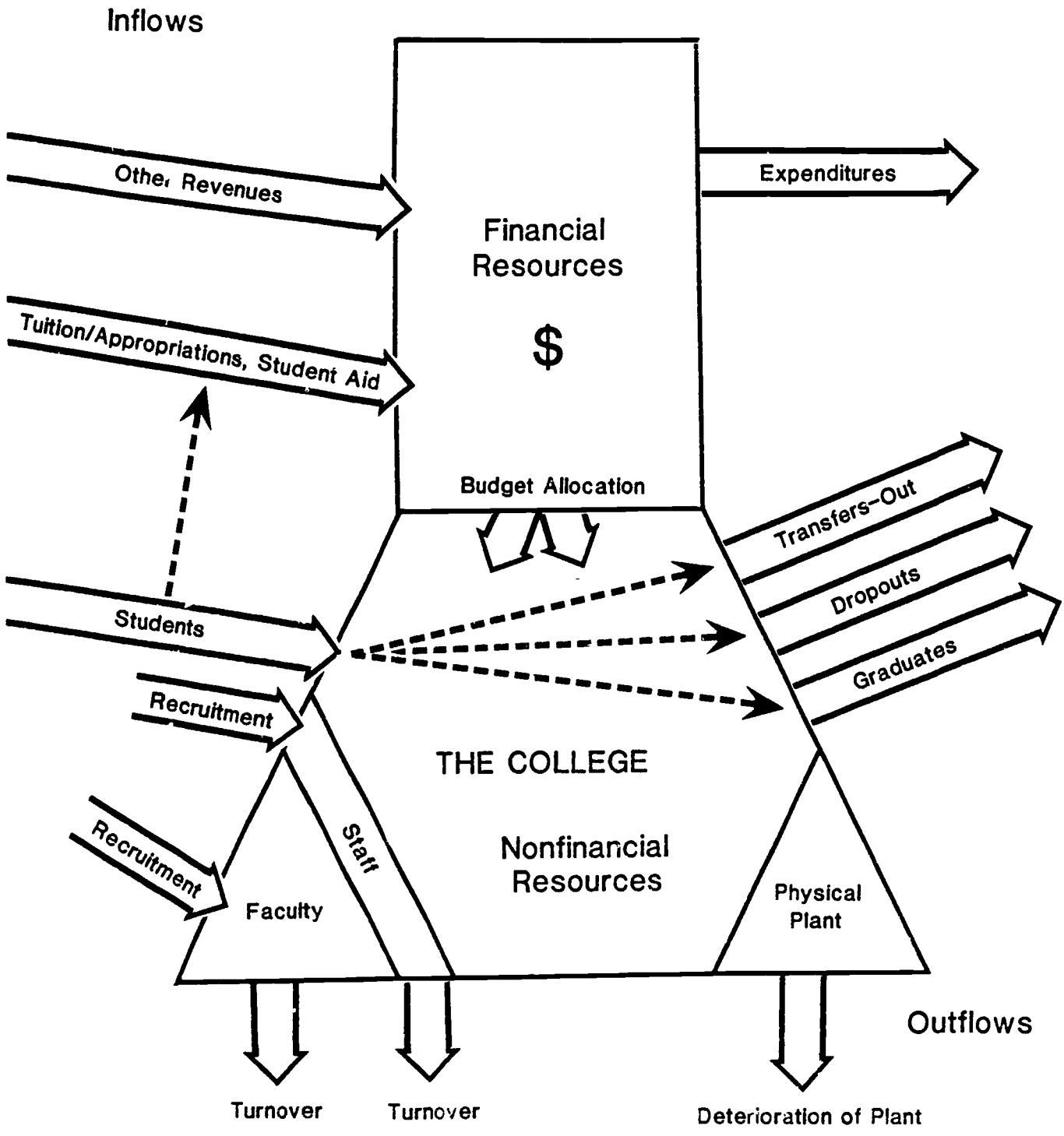

Figure 1. Institutional financial and nonfinancial flows.

plant, the investment in faculty and staff, equipment, and financial resources like working capital, reserves and endowment.

A further assumption we espouse is that institutions will tend to spend out and build up financial reserves with more ease than they will the nonfinancial resources available. Note that once an institution has exhausted its supply of financial resources, it must begin either to increase its debt or to "spend" its nonfinancial resources--allow plant to deteriorate or allow faculty salaries to slip with respect to the pay rates elsewhere in the economy, for example.

Figure 1 shows that students pass through "The College" to become either graduates, transfers-out, or drop-outs. In this process, students avail themselves of the accumulation of nonfinancial resources--faculty, staff, and physical plant, for example. Inflows in the form of tuition and other revenues first build up financial resources and then are allocated through the budget process to the accumulation of nonfinancial resources and to expenditures. Other outflows in the form of losses due to turnover and the deterioration of plant are also shown. The figure is illustrative only; not all inflows, outflows, or resources are shown.

The dotted arrow between students and tuition revenue (and, in some cases, appropriations) highlights the interesting tie between the "raw material" and a major portion of revenue. This tie is one reason why the analogy to the profit sector must be taken with a grain of salt.

A further simplification of the diagram is the lack of any treatment of loans. Institutions needing working capital, after a series of deficits that deplete available cash, for example, may be forced to borrow. This liability must be regarded as the opposite of a reserve. In fact, if an institution then spends the borrowed funds such that its total liabilities exceed its financial assets, it must be described as having <u>negative net financial resources</u>.

The diagram does not indicate the time-frame of the various resources. Endowments are generally not usable in the short term, except the quasi-endowment, where principal can be paid out by board action only. Cash and

other assets listed in the current fund are available much more quickly. With these varying time-availabilities, the resources involved have many different and often restricted uses. Combining measures of the availability of these different time-frame resources is difficult, because their uses and purposes tend also to be very different.

Having negative financial resources is clearly an undesirable situation. If these negative financial resources are short term, then the possibility exists that the institution may find itself unable to meet short-term debt commitments, because more debt exists than current financial assets that could be used to pay off the debt. This situation may require sale of nonfinancial assets needed for other purposes, making longer term commitments at unfavorable interest rates, or even closing the institution, if no other resources are available.

Financial resources of a medium term can be used within a two- to three-year period and represent reserves that the institution has accumulated. These resources can be used to buffer the other nonfinancial resources in the event of a downturn in revenue flows caused by, for example, a drop in student registrants. These medium-term financial resources may also be used to attempt a strategic redirection of the college through investments in an innovative program with a payoff sometime in the future.

The "necessary" amount of financial resources for any institution is determined by many factors. The more fluctuation in income from year to year, the more financial reserve the institution should set aside to protect its nonfinancial resources. Faculty should not be precipitously fired with every fluctuation in enrollment; some funds must be available to smooth the transition or to institute a program to counter the negative trends. The more flexible an institution can be with its expenses, the less of a financial buffer it needs. Institutions with a highly tenured faculty and a large fixed commitment to debt service are in a poor position to respond to income fluctuations without some protection in the forms of financial reserves.

What are some of the major limitations of this preliminary conceptual framework, given our stated purposes? By measuring the level of financial resources, we can only show the funds available for use in effectively managing fluctuations in costs or revenues. These are the funds that successful institutions have accumulated or less successful institutions have lost. We do not know which institutions will successfully manage fluctuations. Thus, the measurement of financial resources cannot be said to be equivalent to the measurement of "financial distress." Changes in financial resources only indicate changes in the probability that the institution will survive external fluctuations, or the "potential for financial distress." The measure of financial resources does not predict external economic fluctuations or the skillful internal use of financial resources.

The difference between public and independent institutions gives a good example of the difficulty of using resource measures as signs of distress. Declining resources at independent institutions are important because they may signal an increasing probability of institutional failure. At public institutions, failure is an unlikely legislative option and probably cannot be predicted by resource declines. But declining resources in public institutions may still signal a discrepancy between the financial needs perceived by institutional administrators and state policymakers, and the declines may signal a decrease in the opportunity for institutional administrators to make effective resource allocations within already tight budgets.

Data Sources

NCES's Higher Education General Information Survey (HEGIS) regularly collects data from the universe of higher education institutions in America; as such, it is potentially the most useful data source on post-secondary education. HEGIS collects data on institutional characteristics, degrees conferred, facilities, finance, enrollments, student residency and migration, and faculty. In the area of finance, data are collected annually on revenues, expenditures, liabilities, assets, and

changes in fund balances. Brubaker (1979) extensively reviewed both the reported accuracy and validity of HEGIS data in comparison with other data and concluded that they have been improving in both qualities over the past five years, representing now the primary data base for research in higher education.

For the purpose of developing indicators of financial health, we are interested primarily in the HEGIS financial data, with secondary interests in enrollments, degrees conferred, institutional characteristics, and faculty data. As indicated above, financial resources, academic resources, and institutional mission are interrelated. Financial resources are paramount, however, because they tend to be more sensitive to changes that affect the institution's finances than measures of quality or mission, and because institutions normally try to buffer their quality and mission from adverse pressure with their financial resources. Thus, changes in financial indicators will usually show trends in the approximate degree of stress that an institution is facing more immediately than shifts in measures of quality or mission.

Recommended Indicators of Financial Health

Many of the financial health indicators previously developed by other researchers can be understood easily with the framework of institutional financial and nonfinancial flows. We will use this structure to classify previously used measures in order that we may see how the proposed measures relate to other work in the field. For example, many researchers have sought to measure the rate of change of inflows, the rate of change of outflows, the relative rate of change of both inflows and outflows, changes in financial resource levels, changes in nonfinancial resource levels, and changes in the need for financial resources. Each study reviewed used indicators that related somehow to resource flows and build-up. Table 1 lists the approaches explored in fourteen research reports on financial health indicators (in chronological order). Appendix A lists the specific indicators used by these researchers.

Table 1

Indicators Used or Proposed

Research Report	RATE OF INFLOW			RESOURCE CHANGE					Financial Resource Needs	RATE OF OUTFLOW	
	Enrollments	Revenue Flow	Revenue Mix	Financial	Nonfinancial: Student Characteristics	Nonfinancial: Faculty Salaries	Nonfinancial: Student/Faculty Ratio	Nonfinancial: Physical Plant		Expenditures	Expenditure Mix
NACUBO (1960)			✓	✓		✓					✓
Jeliema (1973)	✓	✓		✓			✓			✓	
Lanier & Andersen (1975)	✓	✓		✓						✓	✓
McNamee, Gibson, & Bullard (1975)	✓		✓	✓	✓				✓	✓	
Andrew & Friedman (1976)	✓	✓	✓	✓					✓	✓	✓
Lupton, Augenblink, & Heyison (1976)	✓		✓	✓	✓			✓	✓	✓	✓
Anderson (1977)	✓			✓			✓	✓	✓	✓	✓
Farmer (1977)	✓			✓	✓				✓		
Minter (1977)	✓	✓	✓	✓							
Collier & Patrick (1978)		✓	✓	✓					✓		
Minter & Bowen (1978)	✓	✓		✓		✓					✓
Wormley (1978)				✓						✓	✓
Coldren (1979)	✓	✓	✓	✓	✓		✓	✓			✓
Jenny (1979)	✓	✓		✓				✓	✓		

The following section compares indicators of institutional financial health previously used with the indicators that we recommend be developed from HEGIS data. These recommended indicators measure:

(1) changes in institutional distress potential (for independent institutions only),

(2) changes in institutional financial resources,

(3) changes in academic emphasis,

(4) changes in the extent of academic opportunity, and

(5) needs for more financial resources.

Included with each indicator description will be an overview of related indicators previously used or proposed by other researchers. Four terms will be applied to each of these related indicators--predict, correlate, define, or approximate--depending on how the proposed indicator relates to an institutional financial condition of interest to policymakers. Some of the possible indicators may predict the condition by picking out trends in inflows or outflows that under normal conditions lead to the condition of interest. Predictors are usually available earlier from standardly collected data than true indicators, but are often not well related to the events of interest. Too many potential influences must remain constant for us to rely on predictors with great confidence. Nonetheless, predictors often provide timely and useful information.

Some previously proposed financial condition measures can only be said to correlate with the condition of interest. A heavy dependence on a single source of income, for example, may in fact correlate well with other external measures of financial health. This is only a probabilistic statement; not all institutions with heavy dependence on tuition are in financial trouble. Yet, unfavorable financial prospects may result from overdependence on tuitions under certain conditions. A necessary condition, for example, is having costs increase faster than the opportunity to raise tuitions. Indicators that only correlate with conditions of interest can rarely be applied to individual institution analysis with confidence. In most cases, analysts have found these indicators easily measurable and have simply associated them with the conditions of interest.

Indicators may be related to the condition of concern by definition. For example, we will define financial resources as the excess of spendable assets over current liabilities. Many of the indicators from other researchers could also be used to define financial resource levels. For any analysis, the choice of a particular operational definition must be made such that the condition is not too narrowly defined (e.g., financial resources should include some proportion of endowment because most institutions could use their quasi-endowment in situations of distress) and not too broadly defined (e.g., the use of all institutional assets and liabilities to define financial resources would cause the lumping together of many different kinds of resources, many of which cannot be quickly converted into cash).

Some indicators can only be said to approximate a measurement of the condition of interest. These indicators fail as operational definitions because they measure too little or too much. In some cases, these indicators lose comparability among institutions because of a poor choice of normalizing factor. For example, when making a small school's debt comparable to a large school's debt, the debt may be normalized by dividing by the number of students at each institution or by the amount of revenue generated each year. Dividing by the number of students fosters the hidden assumption that students must pay off the debt somehow. Dividing by the revenue flow is probably a better approximation, because that is the base from which the debt must eventually be funded. Normalizing by dividing by the number of students thus produces only an approximate indicator. However, many of these approximate measures are useful for adding a dimension to the process under study.

Institutional Distress Potential

This indicator applies best to privately controlled institutions. It is a measure made by combining short-, medium-, and long-term financial resources (with more weight given to the intermediate resources) to show the financial resources available to cushion external shocks (such as enrollment declines) and available to use to develop new programs to meet emerging programmatic needs. Of course, the amount of financial resources needed by any individual institution depends on a myriad of factors,

including the institution's revenue steadiness, its budget flexibility, and the availability of other emergency funds (through new fund raising, for example). (Some of these factors are measured by another indicator to determine whether the needs for resources in general are declining or increasing.)

The indicator is a weighted combination of (1) the current fund balance divided by total current fund expenditures and (2) the endowment fund balance divided by total current fund expenditures. The current fund balance represents short-term financial resources, and the endowment fund balance represents medium- and long-term financial resources. A higher weight should be given to the current fund side of the combination to acknowledge the restrictions on the use of most endowment assets. A more refined measure (not currently available from HEGIS) would give a separate weight to the "quasi endowment" portion of the endowment. Quasi-endowments are generally originally recorded in the current fund and then moved to the endowment fund by board of trustee action and are not protected by a donor's "in perpetuity" clause. Unfortunately, HEGIS data do not currently separate the quasi-endowment from the regular endowment fund.

Fund balances are defined as the difference between assets and liabilities for any fund group. Thus, for the current fund, the fund balance is the difference between assets (such as the end of the fiscal year cash, accounts receivable, notes receivable, securities, inventories, and funds owed from other fund groups) and liabilities (such as accounts payable, accrued payroll, notes payable, and funds due to other fund groups). By dividing this number by total current fund expenditures, we can get an idea of the size of the reserves in comparison to the size of yearly expenditures. A figure of .5 would indicate that the current fund held net assets equivalent to one-half of a year's budget. In other words, if all income sources dried up, the institution could survive for half a year on these reserves with no change in level of expenditures. Since institutions should not be expecting all revenue to disappear, figures less than .5 will be common. Some institutions try to set aside enough of their current fund reserves to cover a two-year decline of 20 percent in enrollments, so that they would not have to fire any faculty or staff during the first two years of the decline.

Institutions with negative amounts in their current fund balance show an excess of liabilities over assets and must carefully plan each expenditure to avoid having to pay all debts at once. This cash shortage can lead to lost discounts, slow employee benefit payments, and a decline in goodwill toward the institution.

It should be noted that the fund ratio is designed to indicate an institution's changing ability to survive fluctuations in the environment; it neglects several very important factors that can also change the institution's ability to survive. The ability of the institution to bring in a surge of external funds and the ability of the institution to make major budget reforms are not measured. The liquidity of the assets is also not examined. Having all current fund assets in the form of old student accounts is much different from having these assets in the form of cash. Some institutions also keep a store of ready liquid assets in the plant fund, which are neglected by this measure.

Nevertheless, we believe changes in this measure will represent a good indicator of growing trouble or prosperity. Declines in the current fund balance come from spending more than is taken in. This measure is cumulative, so the effect of years of deficits or surpluses is measured. This fund balance measure contains all current expenditures, including transfers-out of the fund and extraordinary charges that may not show up in the statement of revenues and expenditures. The fund balance is compared with the total fund expenditures because of the commitment (in most cases) of current fund revenues to pay any auxiliary liabilities, including debt service shortfalls in dorm and dining hall income (dorm and dining hall expenditures are included in the total current fund). In addition, as the current fund expenditures increase, so does the need for increased reserves. A $200,000 reserve can provide a better cushion for a budget of $2 million than the same $200,000 when the budget has inflated to $3 million.

Both restricted and unrestricted accounts are included. For many institutions, the restricted accounts may be nearly irrelevant to the current purposes of the institution. But for others, the inclusion of

both the restricted and the unrestricted assets and liabilities is necessary to get a clear picture of the financial resources of the institution.

The fund ratio is sensitive to surpluses and deficits and takes into consideration the needs of growing budget expenditures. The measure is superior to simple comparisons of revenue and expenditure trends because it includes much more of the total picture of revenue and expenditure than partial revenue and expenditure comparisons. The difficulty of comparing revenues with expenditures lies in finding a comparable set of both. Too often, dorm and dining hall revenues and expenditures are excluded as are transfers and extraordinary charges and receipts. The proposed ratio attempts to include all current fund transactions and the spillover into the endowment.

Thus, this indicator qualifies under our conceptual framework as a symptom of financial stress with a special intrinsic value. Institutions that find they are unable to offer their mandated services for adequate remuneration very often run deficits. Market pressure leads them to run deficits that result in a decline in this indicator. This indicator of reserve strength also has intrinsic value because institutions need financial reserves to protect their core services from external shocks.

Other researchers have proposed using revenue trends to capture the tendency toward financial distress (Jellema, 1973; Coldren, 1979). Revenue trends are predictive, but are of limited value, unless matched with expenditure trends. Enrollment trends have been used by most researchers and are probably dependable predictors under current conditions. Having an enrollment under 500 has been used to identify institutions that are particularly at risk (Andrew & Friedman, 1976), but low enrollment must be regarded at best as merely a correlate of financial distress. Some small institutions are doing very well financially. The particular mix of revenues has been studied in this connection by many researchers (NACUBO, 1960; Lanier & Andersen, 1975; McNamee, Gibson & Bullard, 1975; Andrew & Friedman, 1976; Lupton, Augenblink, & Heyison, 1976). Certain revenue configurations may correlate with a tendency toward financial distress, but a theoretical basis for the relationship has not been well established.

The number and size of deficits (Jellema, 1973; Lanier & Andersen, 1975) and the ratio of educational and general revenues to educational and general expenditures (Andrew & Friedman, 1976) are predictive, because several years of deficits will erode financial resources. Some researchers have used these deficit-related measures as definitions of the movement toward financial distress, but these measures do not include information on the financial effect of accumulated deficits or surpluses. Measures that incorporate only current fund deficits often neglect transfers to other funds. On the other hand, combining fund balance increases across all funds including endowment, annuity and life income, loan, and physical plant funds (Collier & Patrick, 1978; Wormley, 1978; Coldren, 1979; Jenny, 1979) is probably too inclusive. In fact, fixed asset accumulations tend to dominate this measure and distort it away from any indication of current strength.

Many other measures have been suggested that only approximate desirable indicators of institutional distress potential. An increase in endowment (NACUBO, 1960; Farmer, 1977; Jenny, 1979) probably correlates with better financial health and is thus an indicator of lessened distress potential. Many institutions have no significant endowment, however. The ratio of current assets to liabilities (Minter, 1977; Minter & Bowen, 1978) leaves out resources in noncurrent funds. The ratio of long-term debt to current income (McNamee, Gibson, & Bullard, 1975) neglects current financial difficulties and may in fact be negatively correlated with financial distress potential. Schools with an optimistic outlook may borrow for building construction more heavily than other schools. Current fund balance per student (Coldren, 1979) and assets per student (Minter & Bowen, 1978) relate assets and net assets to students, yet students are usually not the sole source for accumulation of these assets.

Institutional Financial Resources

The same measure as above is proposed to indicate the financial resources of public institutions. As pointed out earlier, however, this fund ratio is not related to survival probabilities when applied to public institutions. This measure shows the changing ability of institutions to meet environmental demands flexibly, to experiment with their own funds,

and to innovate both with academic and administrative programs. A decline in these relative financial resources indicates a decrease in the reserves that institutions may have available at many levels of the administrative hierarchy--for example, to hire part-time faculty to meet extraordinary student demand or to give faculty release time to plan new programs. A decline in the fund ratio indicates a drop in the flexibility that institutions require to accommodate the changing needs of the community and students.

The measure proposed above is clearly an operational definition of institutional financial resources. Other measures have been used to define this condition. Expenditures per student (Andrew & Friedman, 1976) measures the flow of resources to programs benefiting each student. The assumption here is that the higher the expenditures, the larger the overall resources base. Unfortunately, this is not always the case. In fact, the reverse correlation was noted in the study reported by Andrew and Friedman. Due to declines in the numbers of students, the "demised" institutions actually showed more expenditures per student than the "nondemised" institutions. Net worth per faculty member (Coldren, 1979) is also an approximation of institutional financial resources, with the limitation that too much of the value of buildings is included in the calculation.

Academic Emphasis

If forces exist in the environment that are favoring one group of institutions over another, several effects are measurable. A dearth of potential students may lead institutions toward a greater emphasis on student aid, admissions personnel, and even greater fund raising efforts. This will result in a decline in the proportion that instruction, research, and academic support together make up of the entire education and general budget, which we recommend as the indicator of academic emphasis. This measure indicates the degree of budgetary strain an institution may face when it must work harder to survive. The strain shows up as a declining emphasis on academic activities and an increase in budgetary emphasis on administrative activities. To the extent that one sector

faces greater burdens in financial aid, admissions, fund raising, utilities expense, and debt service, this measure points out its disadvantage relative to other sectors.

Other researchers have used a full set of indicators to show how institutional expenses are being allocated. Student services per budget dollar, library expenses per budget dollar, operations and maintenance expenses per budget dollar, and administrative expenses per budget dollar (NACUBO, 1960; Lanier & Andersen, 1975; Andrew & Friedman, 1976) are all useful ratios that help explain changes in academic emphasis; but none of these ratios replaces the proposed measure. Trends in the student-faculty ratio (Jellema, 1973; Anderson, 1977; Coldren, 1979) can also be used to define academic emphasis. What is missing from this ratio is an indication of the degree to which nonacademic concerns dominate the campus.

Academic Opportunity

While the above measure can show relative decline in academic emphasis, another measure is needed to indicate absolute decline. As the total faculty population declines, so does the diversity of opportunity for students. While the student-to-faculty ratio may also decline during a period of retrenchment, the fact that there is an absolute loss of faculty is evidence of decreased opportunity of choice for potential students. These declines correlate with overall program cutbacks as well as restrictions on special course offerings. Monitoring these changes provides a sense of the contraction that may or may not be going on within higher education and of the relative contraction (ignoring the fluctuations of student enrollments) of various sectors within higher education.

The measure proposed is a count of full-time equivalent faculty. Supplemental to this measure should be constant dollar measures of total faculty salaries and full-time faculty; the closest available approximation to these data will be constant dollar transformations of the HEGIS instructional expenditure category.

Another possible measure is to relate the number of course titles to the numbers of students. This measure cannot be computed from HEGIS data

and depends to a large extent on the current level of course listing "housecleaning" at the institution. Another measure would be the change in the number of degree majors offered. No exploratory research has been performed to determine whether this measure is useful. Quite possibly, changes in the measure would be caused more often by redefinitions of academic categories than by actual academic expansions or contractions. Another measure that might correlate with program cutbacks is the number of degrees granted per FTE student enrolled (Coldren 1979). Changes in this number would indicate the "success rate" of the institution in moving students toward a degree. While many factors exist that could influence changes in this number, it may correlate with changes in the extent of academic opportunity.

Needs for More Financial Resources

The ratio of current fund restricted income to the total of unrestricted and restricted income in the current fund gives a measure of the riskiness of revenue flows. Restricted income is designated for certain purposes; upon accomplishment of the purposes, and sometimes simply because of the passage of a period of time, the income ceases. A trend toward increasing dependence on restricted revenue should be regarded as necessitating larger financial resources to carry the institution through any transition periods when these funds may prove inadequate. To the extent that all activity in the restricted purpose area ceases upon termination of the income, more financial resources will not be needed. However, the trends toward various forms of project-oriented "distress" aid often leave the institutions dependent upon that income. The uncertainty of this revenue argues for increased financial reserves to balance the risk.

A supplemental indicator that is partially available from HEGIS measures the flexibility that administrators have within their budgets. The proportion that tenured faculty salaries and debt service payments make up of total current fund expenditures gives a flexibility measure at one level. Adding utilities costs to the numerator adds another level. To the extent that these costs are fixed or require drastic steps to reduce (e.g., firing tenured faculty or delaying on loan payments), the flexibility of the institution to adjust its budget to meet contingencies is

reduced. The more reduced the institution's flexibility becomes, the more it needs financial resources to help buffer environmental fluctuations and to take advantage of opportunities that arise.

HEGIS does not collect information on all tenured faculty salaries, but the data on tenured full-time faculty salaries should be a close approximation. HEGIS also collects data on indebtedness of physical plant, which constitutes most of the fixed debt service owed by institutions. Data on payments to reduce the current fund debt are not collected, nor are separate utilities expenses.

Several other measures have been proposed and used that add information to the determination of a sufficient level of financial resources. The ratio of short-term loans to total expenditures or to total income (Anderson, 1977; Collier & Patrick, 1978) gives a picture of potential immediate needs for financial resources. The amount of short-term loans outstanding is not available from HEGIS. Interest expenditure per budget dollar (Collier & Patrick, 1978) is a similar measure; however, it also is not available from HEGIS and is limited by not including principal repayment requirements. Revenue stability (Collier & Patrick, 1978) might be a significant addition to measures in this area if good historical data were available. Other measures that approximate the need for financial resources include interest divided by student net revenues (Jenny, 1979), total debt divided by student net revenues (Jenny, 1979), debt per student (Farmer, 1977), and debt payments per student (Farmer, 1977). The potential of using HEGIS to even approximate these measures is limited.

Summary

Interest in assessing the financial health of postsecondary education institutions has greatly increased in the past three years. Research in the area of financial health indicators has demonstrated that there are some significant technical difficulties involved. Brubaker (1979) reviewed over 40 studies conducted since 1973. He concluded that (1) which indicators are preferred depends on the intended uses of the indicators;

(2) although many past efforts have foundered because of the lack of suitable conceptual frameworks by which indicators can be validated, such frameworks are now becoming more widely available; and (3) data sources from which to derive indicators are improving, and NCES's HEGIS data bank is the best and most comprehensive source for current research aimed at the universe of postsecondary institutions.

A conceptual framework for institutional financial flows is presented and described. Many of the financial health indicators previously developed by other researchers can be easily understood in terms of this framework. Appendix A categorizes and lists the financial health indicators proposed by previous researchers.

Indicators that can be constructed from HEGIS data were recommended for five aspects of financial health: (1) changes in institutional distress potential (for independent institutions only); (2) changes in institutional financial resources; (3) changes in academic emphasis; (4) changes in the extent of academic opportunity; and (5) needs for more financial resources. Each recommended indicator was accompanied by an overview of related indicators previously used or proposed and their advantages or deficiencies. The indicators of financial health that we recommend be developed from HEGIS data are summarized in Table 2.

Table 2

Recommended Indicators of Financial Health and HEGIS Source

Variable	Indicator
1. Institutional Distress Potential	$A \times \frac{\text{Current Fund Balance}}{\text{Current Fund Expenditures}} +$ $B \times \frac{\text{Endowment Fund Balance}}{\text{Current Fund Expenditures}}$ where, $A + B = 1$, and A and B are positive. The higher A is in relation to B, the more short-term oriented the measure will be.
2. Institutional Financial Resources	Same as 1 above. Includes public institutions.
3. Academic Emphasis	$\frac{\left(\text{Instruction Expend.} + \text{Research Expend.} + \text{Academic Support Expenditures}\right)}{\text{Total Education and General Expend.}}$
4. Academic Opportunity	a. Total Full-Time Equivalent Faculty (from HEGIS Faculty Survey) b. Total Constant Dollar Faculty Salaries (from HEGIS Faculty Survey) c. Total Constant Dollars Spent in Instruction
5. Needs for More Financial Resources	a. $\frac{\text{Restricted Income}}{\text{Total Current Fund Income}}$ b. $\frac{\text{Tenured Faculty Salaries} + \text{Debt Service}}{\text{Total Current Fund Expenditures}}$ c. $\frac{\left(\text{Tenured Faculty Salaries} + \text{Debt Service} + \text{Utilities Expend.}^*\right)}{\text{Total Current Fund Expenditures}}$

NOTE: All sources are HEGIS Financial Survey unless otherwise noted.

*Utilities expenditures not currently available.

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APPENDIX A

Indicators Used or Proposed in Financial Health Research

Rate of Inflow	
Enrollment	
Enrollment trends	Jellema (1973); Lanier & Andersen (1975); McNamee, Gibson, & Bullard (1975); Lupton, Augenblink, & Heyison (1976); Anderson (1977); Minter (1977); Minter & Bowen (1978); Coldren (1979); Jenny (1979)
Enrollments under 500	Andrew & Friedman (1976)
Revenue Trends	
Overall income trends	Jellema (1973), Coldren (1979)
Specific income item trends	Jellema (1973); Andrew & Friedman (1976); Minter (1977)
Tuition and fees per student	Lanier & Andersen (1975); Andrew & Friedman (1976); Coldren (1979)
Revenue per student	Minter & Bowen (1978)
"Revenue draw power"	Collier & Patrick (1978)
Tuition income plus other student payments less unrestricted student aid	Jenny (1979)
Endowment use	Farmer (1977)
Revenue Mix	
Tuition and fees / education and general (E&G) revenues	NACUBO (1960); Lanier & Andersen (1975); McNamee, Gibson, & Bullard (1975); Andrew & Friedman (1976)
Endowment earnings / E&G revenue	NACUBO (1960); Lupton, Augenblink, & Heyison (1976)
Changes in Financial Resources	
Numbers and percentage of deficits	Lanier & Andersen (1975)

Liquid assets / deficit or surplus	Jellema (1973)
Increase in endowment funds	NACUBO (1960); Farmer (1977); Jenny (1979)
Average of the net increases for the year across all five fund groups	Collier & Patrick (1978); Wormley (1978); Coldren (1979); Jenny (1979)
Total assets / total liabilities	Minter (1977); Minter & Bowen (1978)
Liquid assets / current liabilities	Anderson (1977); Minter & Bowen (1978); Jenny (1979)
Current fund deficit / current fund income	McNamee, Gibson, & Bullard (1975); Farmer (1977); Minter & Bowen (1978); Wormley (1978)
Long-term debt / total income	McNamee, Gibson, & Bullard (1975)
Long-term debt / endowment	McNamee, Gibson, & Bullard (1975)
Deficit / endowment	McNamee, Gibson, & Bullard (1975)
E&G revenue / E&G expenditures	Andrew & Friedman (1976)
Current fund revenues / current fund expenditures	Andrew & Friedman (1976); Lupton, Augenblink, & Heyison (1976); Minter (1977); Coldren (1979)
Housing and food revenue / housing and food expenditures	Andrew & Friedman (1976)
Student aid expenditures / student aid revenue	Andrew & Friedman (1976)
Auxiliary enterprise revenue / auxiliary enterprise expenditure	Andrew & Friedman (1976)
Current fund balance / students	Coldren (1979)
Endowment / students	Andrew & Friedman (1976); Minter & Bowen (1978); Coldren (1979)
Assets / full-time equivilent (FTE) students	Minter & Bowen (1978)
Net assets / total assets less interfund borrowing	Minter (1977)

Surplus or deficit / students	Anderson (1977)
Net worth / FTE faculty	Coldren (1979)

Changes in Nonfinancial Resources

Student Characteristics

FTE students / students	Farmer (1977); Coldren (1979)
Percentage in-state students	McNamee, Gibson, & Bullard (1975)
Graduate students / undergraduates	Lupton, Augenblink, & Heyison (1976); Coldren (1979)
Freshmen / bachelors degrees	Lupton, Augenblink, & Heyison (1976); Coldren (1979)
Bachelors degrees / FTE students	Coldren (1979)

Faculty Salaries

Trends in faculty salaries	NACUBO (1960); Minter & Bowen (1978); Coldren (1979)

Student-Faculty Ratio

Students / faculty	Jellema (1973); Anderson (1977); Coldren (1979)

Physical Plant Changes

Current fund revenues / plant assets	Lupton, Augenblink, & Heyison (1976)
Plant assets / FTE students	Lupton, Augenblink, & Heyison (1976); Coldren (1979)
Operation and maintenance (O&M) expenditures / plant assets	Anderson (1977)

Other Resources

Student loan delinquencies	Jenny (1979)

Dorm occupancy	Coldren (1979)

Changes in Financial Resource Needs (Risks)

A measure of the institution's closeness to an optimum revenue distribution	Collier & Patrick (1978)
Plant dept / plant assets	Collier & Patrick (1978)
Relative endowment yield	Collier & Patrick (1978); Jenny (1979)
Short-term loans / total expenditures	Anderson ([977); Collier & Patrick (1978)
Interest expenditures / Total expenditures	Collier & Patrick (1978)
"Revenue stability"	Collier & Patrick (1978)
Unrestricted revenue / total revenue	Collier & Patrick (1978)
Tenured faculty salary plus O&M expenditures / total expenditures	Collier & Patrick (1978)
Plant investment / plant liabilities	Jenny (1979)
Interest and debt repayment / student net revenues	Jenny (1979)
Interest and debt repayment / student net revenues plus auxiliary income	Jenny (1979)
Debt payment / students	Farmer (1977)
Debt / students	Farmer (1977)
Fund balance / students	Anderson (1977)
E&G revenues / fixed operating costs	Lupton, Augenblink, & Heyison (1976)
Plant debt payment / plant debt ending balances	Andrew & Friedman ([976)

Debt / fund balance	Anderson (1977)
Debt / current fund income	Anderson (1977)
Principal and interest / current fund income	Anderson (1977)

Rate of Outflow

Rate of Expenditure Change

Expenditures / students	Jellema (1973); Lanier & Andersen (1975); Andrew & Friedman (1976); Farmer (1977)
Total expenditures	Lupton, Augenblink, & Heyison (1976); Anderson (1977); Wormley (1978)
E&G expenditures / degrees conferred	Lupton, Augenblink, & Heyison (1976)

Expenditure Mix

Library expenditures / E&G expenditures	NACUBO (1960); Lanier & Andersen (1975); Andrew & Friedman (1976)
Plant addition expenditures	Lupton, Augenblink, & Heyison (1976)
Administrative expenditures / E&G expenditures	NACUBO (1960); Lanier & Andersen (1975)
Net cost of student aid / E&G revenue	NACUBO (1960)
Net cost of student aid / tuition revenue	NACUBO (1960); Anderson (1977)
Instructional expenditures / E&G expenditures	NACUBO (1960); Andrew & Friedman (1976); Lupton, Augenblink, & Heyison (1976); Coldren (1979)
Student services / E&G expenditures	NACUBO (1960)