

Resource Allocation Strategies In Doctoral/Research University (extensive) Libraries

By Barbara Blake Gonzalez

B.S. 1992, High Point University

M.A. 1994, University of Leeds

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Dissertation directed by

Walter A. Brown

Associate Professor, Urban Higher Education, Jackson State University

The Graduate School of Education and Human Development of The George Washington University certifies that Barbara Blake Gonzalez has passed the Final Examination for the degree of Doctor of Education as of July 16, 2010. This is the final and approved form of the dissertation.

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Barbara Blake Gonzalez

Dissertation Research Committee

Walter A. Brown, Associate Professor, Urban Higher Education, Jackson State University, Dissertation Director

Sharon A. Dannels, Associate Professor of Educational Leadership, Committee Member

Tia McNair, Assistant Director, National College Access Network, Committee Member

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## Dedication

This dissertation is dedicated with love in memory of my grandfather, Eric O. Whitworth. He always believed in me and dreamt of a better life for me. His love and encouragement paved the way for my future studies.

## Acknowledgements

By no means was the completion of this dissertation the result of my efforts alone. First and foremost, I would like to thank my advisor and dissertation chair, Dr. Walter Brown. He provided unwavering support and never lost confidence in me. I am sincerely grateful for his assistance.

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## Abstract of Dissertation

### Resource Allocation Strategies In Doctoral/Research University (extensive) Libraries

The purpose of this study was to identify and understand the management of resources by library directors at 151 Public and Private Carnegie classified extensive university libraries in an environment of limited funding for higher education. This study examined the following research questions:

1. What resource allocation strategies are used by the directors of doctoral/research university (extensive) libraries? Which strategies are most and least frequently used? From participant responses, does the use of a hybrid mode emerge?

2. What are the internal and external conditions of the library environment that precipitate the use of such strategies?

An in-depth analysis of these resource allocation strategies were developed from the response of library directors. As a result, the rationally based strategies of formula, program or program-planning-budgeting system (PPBS), zero-based (ZBB), and the politically based strategies of incremental line item, performance/incentive, and responsibility/cost center budget were the focus of the budgeting activities in question. The results from the study indicated that the percentage and frequency distribution of resource allocation strategies used in extensive libraries were undetermined. Prior to this study, the strategies employed at the 151 libraries were found to be relatively unidentified.

Research findings support the conclusion that the highly experienced professionals that direct the nation's top research libraries do employ specific budgeting

strategies to allocate their scarce resources while navigating a sea of challenging obstacles that arise from conditions both internal and external to the library and the greater university. In addition, their use of more than one budgeting strategy for the management of the operating budget coupled with the directors' assertion of the importance of flexibility in managing and implementing the library budget would suggest the need for future study of the use of multiple budget strategies or budget hybrids in the academic library. Budget hybrids could provide the basis for an improved understanding of the management of large, complicated organizational units faced with navigated financial changes and uncertainty on a habitual basis.

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## CHAPTER 1

Academic libraries at Carnegie classified doctoral/research universities (extensive) are large and often include collections in excess of 1,000,000 volumes, operating expenditures from \$10,000,000 to \$110,850,000 and a spread of 127 to 1,277 employees (ARL, 2008). These libraries are invaluable to higher education by supporting institutional accreditation standards and by fulfilling the basic academic mission of students and faculty. According to Budd (2005) the current economic conditions surrounding these academic libraries are ‘‘overly’’ complex, characterized by decreased funding, steep serials inflation, and publisher monopolies. Furthermore the buying power of library directors has substantially decreased whereas the need to satisfy the demand for unlimited goods and services with a limited supply of library resources has considerably increased (Coughlin & Gertzog, 1997; Evans, 2001; Hisle, 2002; Kingman, 2001; Lynch, 1989, 1985; McElrath, 2002; Moran, 2005; Nozero & Vaughn, 2000; Saunders, 2003; Todaro, 2008; West & Stromgren, 2003).

Libraries are resource-intensive organizations and resource allocation strategies are an essential component to the management of the academic library (Budd, 2005; Linn, 2007). Budgeting in large academic libraries is under researched given the libraries’ important mission to the higher education community and the libraries’ complex financial structure. This study fills this research gap to develop an identification and understanding of what library directors are doing in this dynamic environment to manage their limited resources and to promote understanding of one of the largest and complex university cost centers, the academic library. In this study, these libraries shall be termed ‘‘extensive libraries.’’

## The Problem

Amidst the divisive debate on why costs have risen in university cost centers while state and federal funds have decreased over the past 25 years, there is an obvious consensus within higher education that universities should allocate their financial resources in the most efficient manner to alleviate scarcity (Altschul et al., 1992; Clotfelter, 1999; Kingma, 2001; Massy, 2003). Given the scope and complexity of the economic issues, little empirical or theoretical work has focused on the management of higher education (Chaffee, 1981). Nowhere is this more evident than among libraries. The economic facets of a large, complex organization can make resource allocation in an academic library a difficult process (Birnbaum, 1988; Kingma, 2001; Linn, 2007; Massy, 1996; Pfeffer & Salancik, 1974; Troll, 2002).

Colleges and universities have had to do more with less over the past 25 years due to a decrease of overall funding by the state and federal government. Academic libraries must remain on the cutting edge of supporting faculty and student scholarship and maintaining accreditation standards (Balderston, 1995; Birnbaum, 2001; Budd, 2005; Changing, 2006; Sapp & Gilmour, 2002; Todaro, 2008). The directors of extensive academic libraries face intense pressure to maintain and advance current levels of service and materials while they lack abundant resources to meet all their needs. According to West and Stromgren, “No matter how committed an institution is to having a top-notch library, funds are not available to give libraries the money they need” (2003, p. 951). The complex environment characterized by the increased competition for institutional resources, the inflation of the costs of serials, the complexities of straddling both hardbound and electronic collections, salary competition, and increased technology costs

further emphasize the need for the improved budgeting of library resources (Birnbaum, 2001; Coughlin & Gertzog, 1997; Evans, 2001; Kingma, 2001; Moran, 2005; Nozero & Vaughn, 2000; Saunders, 2003; West & Stromgren, 2003). The problem examined in this study is which resource allocation strategies are being used in academic libraries (if any) to manage limited resources and to describe the current complexities of the financial environment of these libraries.

Lack of knowledge about the resource allocation strategies being used at Carnegie classified extensive libraries explains why so little is known about specific library resource management activities. Clodfeldter (1999) states that “for all the time that many of us spend participating in the production process of higher education, it is remarkable how imperfectly that process is understood” (p. 5). Current empirical data on resource allocation strategies in large academic libraries are crucial to understanding the internal administrative budgeting activities in use in library offices on a daily basis. It is from these activities that the manner in which library directors manages their scarce resources in a complex demanding environment is understood. In an age where the competition for institutional funds is greater than ever, doing more with existing funds is crucial and that is the dilemma of the academic library (Budd, 2005; Lasher & Greene, 2001; Linn, 2007; Troll, 2002).

In 1844, Ralph Waldo Emerson commented that “money is of no value, it cannot spend itself. All depends on the skill of the spender” (p. 37). Money is key to achieving library goals but Emerson’s point is well taken; the allocation and budgeting of library funds is just as important as the dollar amounts in question and understanding the administrator’s actions is crucial to understanding the budget process to maximize the use

of library funding (Linn, 2007; Schick, 1985). Today's librarians are less likely to receive unexpected, unrestricted funds (Scott, 2001). "Librarians must seek to maximize the efficiency and effectiveness of current resource usage ... librarians must become more assertive and savvy in presenting the library's case" (Goudy, 1993, p. 215). To manage fiscal constraints, library administrators must question how they allocate their resources, and how they can revise, redefine themselves, and reengineer their budget strategies (Scott, 2001; Shaughnessy, 1989). Budd (2005) comments that the money problems of the library are permanent and difficult. Finding new resourceful ways to spend funds will be elusive unless there are challenges to the same systemic patterns of resource allocation.

Theoretical models developed by literature critiques and case studies fail to address the financial environment and the strategies used by library administrators. Numerous recommendations exist from the research literature for further studies on resource allocation strategies (Bremer, 1994; Cope, 1987; Garvin, 1980; Hayes, 1993; Jacob, 1990; Keller, 1993; Liu, 2003; Massy, 2003, 1996, 1990; McClure, 1981; Schmidtlein & Milton, 1990; Shulock & Harrison, 1998). Complicating the picture is the fact that few empirical studies exist to adequately describe resource allocation and budgeting strategies among administrators at these extensive libraries which have grown more complex over time.

#### Economic Conditions of the Academic Research Library

The economic conditions of the past 25 years have taken their toll on academic libraries. Despite the value of adequate library services and the support of qualified, professional staff to a research university, decreased funds, escalating costs, and a



demand shift for 24 hour access to library materials have decreased the dollar power of academic libraries (Coughlin & Gertzog, 1997; Evans, 2001; Hisle, 2002; Kingma, 2001; Lynch, 1985, 1989; McElrath, 2002; Moran, 2005; Nozero & Vaughn, 2000; Sapp & Gilmour, 2002; Saunders, 2003; Todaro, 2008; West & Stromgren, 2003). The Association of Research Libraries (ARL) is a nonprofit organization of 123 research libraries at comprehensive, research-extensive institutions dedicated to supporting the needs of these libraries. The member libraries make up a large portion of the academic and research library marketplace, spending more than \$1 billion every year on library materials, and represent the majority of the extensive libraries presented in this study. A series of annual publications that describe the collections, expenditures, and library activities for ARL member libraries since 1961 have been published by ARL (About ARL, 2007).

The ARL (2003) comparative reference, which used the annual consumer price index (CPI) for the increases in library expenditures, stated from 1986 to 2003, the CPI for library expenditures spread from 109.6 in 1986 to 183.9 in 2003. From 1981 to 1995, the acquisitions budgets of 89 of the nation's largest academic libraries nearly tripled as a response to severe serials inflation. Despite substantial institutional commitments to support library activities, the buying power of the directors has consistently diminished in the face of such rampant inflation (West & Stromgren, 2003). These economic facts are a tremendous financial stress for these library directors. Today's librarians face an uncertain environment shaped by diminished resources, new demands, technological advances, and demographic changes (Troll, 2002). Empirical data on resource allocation

strategies are crucial to understanding how administrators are managing their library's resources in today's economic times.

The discussion of complex economic conditions of the academic library continues in the next chapter sections analyzing library funds and the three categories of library expenditures.

### *Library Funds and Expenditures*

The operating funds of libraries are derived from budget appropriations, grants, and gifts. Libraries may charge for providing certain services but the income received is a small portion of the library's overall budget (Budd, 1998). One source of confusion over the funding of library operations is the free rider problem. The free rider problem refers to a situation where some individuals in a population either consume more than their fair share of common resource or pay less than their fair share of common resource. The university cannot sustain accreditation without the library so deciding on how to pay for the library among good and service receivers is difficult. Should all academic units pay the same for library access? Quantifying exactly how much money should be appropriated to the library from the university's educational and general (E&G) expenditures fund is complicated. With increased competition for institutional resources on campus, funding decisions are often characterized by rational attempts to justify library needs and political negotiations on where funds should be spent.

The Association of College Research Libraries (ACRL) once recommended that a minimum 6% of the university E&G fund be allocated to the library. Goudy (1994), after a 20 year review of library funds from 1970 to 1990, concluded that the 6% standard was not an achievable benchmark for academic libraries. The ACRL replaced the 6%

calculation with a more generalized statement on the need for library funding to equal library goals (Allen & Dickie, 2007). Budd (2005) states that some accreditation associations have recommended 5% of the E&G fund for the library. Estabrook (2009) in her published interviews with 25 Chief Academic Officers (CAOs) reported that library budgets tend to be limited to a certain overall institutional percentage but CAOs reported the routine assignment of special, additional college funds to the library. Stubbs (1994) surveyed 88 ARL libraries and cited a 6% decline in the E&G library budget appropriation over a ten year period. Stubbs' observed budget appropriation percentage in academic libraries was quite less than a 5 or 6% recommendation, 3.91% in 1982 and 3.32% in 1992. Currently, there is no discernable standard for the amount of budget appropriations a library should receive from university administrators. Budd (2005) suggests that the institutional accreditation process offers a great opportunity for university administrators and the library director to review this important financial computation together. In this study, library directors will be queried on their perception of if they receive 6% of the university E&G fund for the library to further research this difficult calculation.

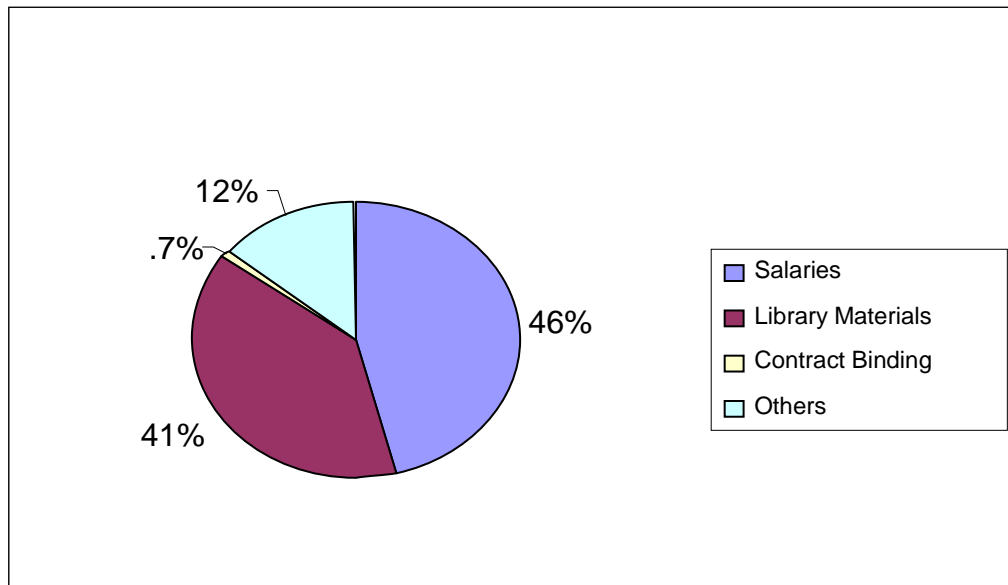
Much easier to quantify, library costs typically include acquisitions, technical services, public service, personnel, and maintenance of library buildings (Brown & Gamber, 2002). The United States Department of Education's National Center for Education Statistics (NCES) published an Academic Libraries Questionnaire in 2006 that produced descriptive statistics about the academic libraries in the United States. Of the 3,617 2-year and 4-year institutions in the United States, 89% of those institutions contacted responded to the NCES web-based questionnaire to provide key data for the

analysis of library operations. From these data, the Academic Libraries Questionnaire characterizes the cost structure in academic libraries to include three general categories: labor, information resources, and all other costs associated with operating the academic library.

The growing burden of these labor, information resource, and other costs have placed further emphasis on the importance of improved resource management (Birnbaum, 2001; Budd, 2005; Coughlin & Gertzog, 1997; Evans, 2001; Kingma, 2001; Moran, 2005; Nozero & Vaughn, 2000; Saunders, 2003; West & Stromgren, 2003). The 2006/2007 percentage breakdown of general library operating expenditures is found in Figure 1. As illustrated, salaries and library materials are significant cost drivers for these libraries constituting 46% and 41% of the total cost respectively. The other category includes furniture, equipment, computer hardware and software, bibliographic utilities, networks, consortia, and all other operating expenditures (NCES, 2008). The smallest expenditure is reserved for long-term contract agreements encompassing various types of library goods and services.

Figure 1

*Library Operating Expenses - 2006/2007*



*Note:* Source: Association of Research Libraries (ARL, 2008)

*Labor costs.* The library services in university libraries are performed by professional staff. From the 2005/2006 ARL Statistics report, the salaries and wages reported by ARL members are found in Table 1. For 113 reporting research libraries, total library wage expenditures accounted for over \$1.3 billion as shown in Table 1. Budd (1990) examined the labor expenditures in academic libraries and found the percentage of total labor costs spent in 1976 and in 1985 did not diminish. Those percentages of 46.5% and 47.1% respectively, are parallel to the 46% reported in 2006 by ARL (2008). Because labor continues to be a cost driver for academic libraries, university administrators are faced with challenging resource management decisions that often require the reduction of labor costs. In Table 1, the total library wages spent and the breakdown of salaries and wages among professional and support staff, as well as student

assistants in 2005 by 113 ARL member libraries demonstrates that personnel costs are a major expenditure for academic libraries.

Table 1  
*2005/2006 Extensive Library Wage Expenditures Summary*

	Salaries & Wages Professional Staff	Salaries & Wages Support Staff	Salaries & Wages Student Assistants	Total Salaries &Wages
Median	4,704,501	3,835,646	693,545	9,444,855
High	36,580,197	19,745,688	3,650,008	58,047,311
Low	1,855,687	829,702	81,674	4,440,988
Totals	663,055,019	536,402,618	101,289,643	1,300,747,280
Number of Libraries Reporting	113	113	113	113

*Note: 2005/2006 ARL Statistics Tables (ARL, 2007)*

Fiscal constraints in libraries are most felt by staff who may suffer loss of traditional jobs and lower salaries. The expansion of technology in library science and its continued outlook for professional growth suggest that highly skilled labor costs will increase in the future. Managing the labor costs of a highly trained staff is but only one challenge for a director of a large academic library (Nozero & Vaughn, 2000; Saunders, 2003; West & Stromgren, 2003). If a library director reports a decrease in total labor expenditures, barring routine staff vacancies, the impact of that decrease should be of a concern for any administrator interested in the quality of library services and the attainment of institutional goals and objectives (Budd, 2005). Second to personnel costs,

library materials costs are important and without timely, quality publications to fill the collection, the library cannot fulfill its basic mission.

*Library materials costs.* The most alarming trend in the complex and changing environment of the academic library is the increase of information resource expenditures. The 2006 NCES Academic Libraries Questionnaire defined information resources as books, serial backfiles, current serial subscriptions and search services, audiovisual materials, document delivery/interlibrary loan, preservation, and other materials. The cost of scholarly journals is the single largest factor in the increasing costs of library operations. Since 1986, materials expenditures have risen the most rapidly at an average rate of 6.4% per year (Hisle, 2002; Kyrillidou, 2005; Nozero & Vaughn, 2000; West & Stromgren, 2003). For most large academic libraries, journals comprise 70% of the acquisitions budget, and cost more than \$500 million annually (West & Stromgren, 2003). As described in Table 2, library expenditures at Carnegie classified institutions at the doctoral level are vast, and are well in excess of the Master's I and II classified institutions. (For specific definitions of Carnegie classifications, see Appendix A.)

Table 2  
*2006 Library Expenditures by Control and Largest Carnegie Classification*

Institutional Characteristics	Total Number of Libraries	Total Expenditures	Salaries and Wages	Information Resources Total	All other operating expenditures
All	3,617	\$6,234,191,836	3,102,560,577	2,375,484,525	756,146,734
Postsecondary degree-granting institutions with libraries					
Control:					
Public	1,570	\$3,730,749,705	1,907,064,047	1,392,062,460	431,623,198
Private	2,047	\$2,503,442,131	1,195,496,530	983,422,065	324,523,536
Carnegie Classification :					
Doctoral	255	\$3,559,747,403	1,600,782,640	1,482,440,591	476,524,172
Master's I and II	582	\$1,113,191,413	584,234,550	408,830,840	120,126,023

*Note:* Source: U.S. Department of Education, Academic Libraries Questionnaire, 2006 (NCES, 2008)

To fully understand the rising costs of scholarly publications, it is important to comprehend the underlying components of the problem. Prestigious journals and other publications are the cornerstones for academic learning. These are inelastic goods or goods with few substitutes. Serial subscriptions in the library are highly demanded, and are often purchased to the detriment of other budget lines such as books and salaries (ARL, 2004). The fact that scientific and technical journals are among the highest priced in the world contributes to the complicated cost structure of scholarly works. There is significant faculty resistance to omitting these publications from the library that by its very nature is there to support the institutional mission of the university. Many faculty



members view these publications as a public good rather than goods with associated costs (Kingma, 2001; Lynch, 1985, 1989; Marchant, 1976; Tierney, 1981; Troll, 2002; West & Stromgren, 2003). Academic libraries are expected to remain on the cutting edge of supporting faculty and student scholarship. Nevertheless, the budgetary constraints of libraries truly dictate the availability and accessibility of such journals despite constituent demands.

*Other costs.* The 2006 NCES Academic Libraries Questionnaire also defined additional cost categories as furniture, equipment, computer hardware and software, bibliographic utilities, networks, consortia, and all other operating expenditures. Technology is the major cost category that complicates the rising costs of scholarly works. Most academic libraries are moving from a present dominated by print-based information resources to a future which will be dominated by electronic information resources (West & Stromgren, 2003). The World Wide Web has revolutionized the way libraries deliver services from remote access to online catalogs. The delivery of new and innovative services through digitization projects and distance learning technologies is transforming the brick and mortar library model to a virtual model (ARL, 2004). In this environment, the library director must decide which collections will be on the shelf or in the network. Currently, most academic libraries straddle print and electronic collections which are a very costly endeavor. In 2004, the ARL forecasted that most libraries were in the early stages of a long transitional period in which a hybrid model would reign. However, at the 2006 ACRL conference in Chicago, the ACRL roundtable on Technology and Change in Academic Libraries discussed that although libraries face difficult choices between purchasing print publications and/or digital resources, many

librarians are focusing more time on acquiring new and improved ways to foster knowledge dissemination. The emphasis is less about print or digital and more about how the library with staff and materials can be the supreme information navigator for students and faculty.

Implementing new technology to provide electronic resources and purchasing electronic volumes place a double strain on a library budget. In the NCES Academic Libraries Questionnaire, all 126 research libraries reported a costly 100% access by primary clientele to the electronic catalog, indexes, and references on and off campus. Providing high quality information services is increasingly difficult. The juxtaposition of major innovations in communications technology at a time with a rapid rise in both the price and the quality of scholarly communications has brought many academic libraries to a resource crossroads (Brown & Blake Gonzalez, 2007; Evans, 2001; Hisle, 2002; Kingma, 2001; Meyer, 1997; Moran, 2005; Nozero & Vaughn, 2000; Saunders, 2003; West & Stromgren, 2003). In 2002, Gilbert and Ehrmann offered a set of portfolio strategies for the administrator faced with implementing technology. Of particular interest is Gilbert and Ehrmann's recommendation for establishing criteria and mechanisms for resource management decisions. Directors must make wise resource allocation decisions or face the unpleasant scarcity of goods and services that make administrators, faculty, students, and alumni dissatisfied. Library directors must invest the time to completely understand the workings of the university and the internal and external pressures that impact successful resource allocation (Budd, 2005; Goudy, 1993).

In summary, the complex economic conditions of the academic library are characterized by increased inflation, a limitless demand for library goods and services,

and rigorous competition among university cost centers for library appropriations and these conditions make library operations challenging. (Allen & Dickie, 2007; Budd, 2005; Evans, 2001; Hisle, 2002; Kingma, 2001; Meyer, 1997; Moran, 2005; Nozero & Vaughn, 2000; Saunders, 2003; West & Stromgren, 2003). Libraries are resource-intensive organizations and resource allocation strategies are an essential component to the management of the academic library (Budd, 2005). Consequently, how administrators allocate and budget their scarce resources is crucial to developing an identification and understanding of what library directors are doing in this dynamic environment to manage their limited resources to support faculty and student academics.

#### Purpose Statement

The purpose of this study is to develop an identification and understanding of what library directors are doing in a dynamic environment to manage scarce resources. By describing the current budgeting activities in use, identifying library resource allocation strategies, and understanding the current complexities of the library environment, an in-depth look into resource allocation will be developed with the library directors providing the basis for an improved understanding of library management and the budgeting of scarce resources.

The thesis of this dissertation is that the percentage and frequency distribution of resource allocation strategies used in extensive libraries is undetermined. Although much emphasis in the literature has been placed on what types of strategies work best to help manage difficult financial challenges, the activities employed at the 151 public and private extensive libraries to allocate resources and the economic environment that precipitate these activities are relatively unidentified. These activities should be identified

to understand how library directors manage resources in a changing environment *before* focusing on which budgeting practices are the *most* appropriate for the job. The purpose of this study is not to determine if any one strategy is a better strategy for resource allocation. Instead, the researcher in this study emphasizes the view that before the effectiveness or efficiency of any strategy can be addressed; the identification of which strategy(s) is being used in academic libraries and under what conditions is essential to the overall understanding of resource allocation in the library community.

Simply, to develop better resource allocation strategies, the library community, albeit the scope of this research is limited to the upper echelon of academic libraries, should arrive at these strategies as a community (Camp, 1989). At the 14<sup>th</sup> annual ACRL National Conference in Seattle, Washington, in a roundtable discussion on academic libraries led by the researcher of this study, several library directors expressed their concern and frustration over the budgeting process and stated the need for more knowledge on what practices are best applicable for academic libraries. Dr. Larry Wilt, Director of the Albin O. Kuhn Library and Gallery, at the University of Maryland, Baltimore County, commented that libraries are looking to other libraries for improved budgeting practices. He stated that once certain strategies were deemed successful, these strategies would most certainly disseminate throughout the academic library community (March 14, 2009, personal conversation). Although a criticism of a community based approach is that specific individual library situations call for particular resource allocation strategy(s), the body of resource allocation literature is not founded in library management and not even in higher education administration. The typical ways in which resources are allocated come from economics and business management literature

(McConnell & Brue, 2007). Because libraries are in a struggle to modify boilerplate strategies for their needs anyway, the individual libraries are without specific library management resource allocation strategies (Allen & Dickie, 2007; Budd, 2005). To develop this type of community based approach, this study fills this gap and develops an identification and understanding of what library directors are doing to manage their limited resources.

### Research Questions

1. What resource allocation strategies are used by the directors of doctoral/research university (extensive) libraries? Which strategies are most and least frequently used? From participant responses, does the use of a hybrid mode emerge?
2. What are the internal and external conditions of the library environment that precipitate the use of such strategies?

### Conceptual Framework

The primary basis for the conceptual framework of this study begins with the assertion that resource allocation is simply, the complex process of decision making. The terms commonly used to describe this type of decision making include model, budget, plan, strategy, technique, methodology, approach, practice, and activity (Kingma, 2001; Lasher & Greene, 2001). A brief review of terms is found in Appendix A.

Two of Morgan's (1984) models on resource allocation decision making provide the scaffolding for this study's research. Morgan compacted dozens of budgeting strategies and simplified resource allocation decision making in that "the choice in budgeting strategies is between those that optimize the fundamental tenants of modern

management science--effectiveness and efficiency--and those that complement the realities of organizational political environments” (Leslie, 1984, p. 2). In determining which resource allocation strategies are in use (if any) by library directors, Morgan’s models provide direction on the importance of rational transparency in budgeting and also address the important role of political negotiation of resource management. It is suspected that library directors’ decision making strategies are influenced by rational and political influences. The six most common budgeting strategies identified in Morgan’s two models ultimately lay out the conceptual framework on how library directors are commonly making their resource allocation decisions.

The first model espoused by Morgan is the rational calculation view which describes decision making strategies based on impartial needs. The second model is the market interaction view based on political decision making where strategies are based on constituent wants rather than purely rational grounds. Rational resource allocation strategies include formula, program, commonly referred to as Program, Planning and Budgeting System (PPBS), and Zero-based budgeting (ZBB). Market resource allocation (commonly referred to as political) strategies include incremental line item, performance/incentive, and responsibility/cost center budgeting. Morgan does not conclude that rational resource allocation is more efficient than market or political allocation. However, he does suggest that “superior institutional solutions will reflect a synthesis of the two models” (Leslie, 1984, p. 3).

This study develops an identification and understanding of what library directors are doing to manage their resources by examining their use of the six resource allocation strategies previously described. By identifying the rational or political resource allocation

strategies that describe the current budgeting activities in use, the process of resource allocation decision making in libraries will be characterized. The data from this study will provide a commentary on the use of the three rational and three market strategies, the use of multiple budgeting strategies or hybrid use, and the environmental context of these budget strategies in complex times.

### Significance of Study

This study develops an understanding of resource allocation strategies used to manage scarce resources in the financial environment of extensive libraries to address the lack of empirical data on resource management. This dissertation will contribute new knowledge in higher education by reporting the types of strategies being used by the 151 directors of the largest and most significant academic libraries in the US, which hold 55% of the country's 913.5 million academic paper volumes (NCES, 2000). The complete list of universities is found in Appendix D. Current empirical data on resource allocation strategies in large academic libraries are crucial to understanding the internal administrative budgeting activities in use in library offices on a daily basis. It is from these activities that the manner in which library directors manages their scarce resources in a complex demanding environment is understood. Calls for research on resource allocation in higher education have stated "if future studies are to advance understanding of financial management, they will need to study real universities in real time" (Geiger, 2003). This dissertation fills the resource allocation gap by providing timely and relevant data.

Resource allocation is a relevant topic of investigation in universities with implications for theory and practice (Clayton, 2001; Jarzabkowski, 2002; Lynch, 1985,

1989). Coughlin and Gertzog (1997) contend that a library that wishes to enhance its production function must focus on “improved internal processes” (p. 7). The need to adapt to a stressful, changing environment is also critical for library survival, and there is a growing interest in improving internal competence to adapt to change (Kast & Rosenzweig, 1972; Lewis & Dunder, 2001).

An increase in the awareness of resource allocation strategies would contribute to the literature by reporting internal activities that are crucial to understanding budget management within extensive libraries. An increased awareness of the budgeting process could offer valuable insight to the often difficult budgeting process to the novice and the expert (Allen, 1995; Birdsall, 1995; Linn, 2007; Morgan, 1984; Troll, 2002). The impact of the existence and relevance of hybrid budgets is of particular interest in this study. This topic is under researched in library management literature. In one of the latest budgeting primers commonly used by librarians, although several budgeting strategies are presented as choices for library administrators to use, there is little mention of the blending of budget methods for enhanced resource allocation (Hallam & Dalston, 2005). It is the belief of this researcher that library administrators have long blended their budgeting strategies to better address their resource management needs. This “budget blending” may have occurred over time and without process intent. The outcome was what the library administrator desired and this is one of the principal reasons why it is believed to have occurred (Linn, 2007).

The study will also assist those individuals who wish to develop a better awareness of resource allocation and budgeting in large organizational units. This dissertation will provide university and library staff and administrators with current



empirical data on the resource allocation strategies being used at the 151 extensive libraries in the United States with a total operating budget of over \$3 billion dollars in 2006 (NCES, 2008). An awareness of budgeting strategies in complex library environments may enable individuals to become knowledgeable about choosing and implementing resource allocation strategies for their budgeting purposes in other complex environments.

### Limitations

An assumption in this study is that resource allocation strategies are being used in extensive libraries to guide allocation decisions. The directors of large academic libraries are assumed financial leaders with knowledge about resource allocation strategies and the management of the library (Hallam & Dalston, 2005; Munn, 1983; Neville, 1980). Furthermore it is assumed that the strategies being employed can be identified through a questionnaire instrument and that the library directors are willing to report their budget activities. Fraenkel and Wallen (1993) stated that nonresponse may be due to reasons such as “lack of interest in the topic being surveyed, forgetfulness, and unwillingness to be surveyed” (p. 356). All efforts were made to avoid these common reporting problems in this study whenever possible. It is a further delimitation that the resource allocation strategies used to specifically develop the library operating budget is the focus of this research. An operating budget is defined as both the unrestricted funds and the core budget of the library (Evans, 2001; Lasher & Green, 2001).

Although numerous resource allocation strategies exist, the strategies repeated below are included in the scope of this study:

1. Formula budgeting

2. Program budgeting/ PPBS
3. Zero-Based budgeting (ZBB)
4. Incremental line item budgeting
5. Responsibility/Cost Center budgeting
6. Performance budgeting/Incentive budgeting

These six strategies represent the most applicable to complex library environments and are the most well defined budgetary strategies as noted by Caruthers and Orwig (1979), Leslie (1984), McKay (2003), Meisinger and Dubeck, (1984), and Morgan, (1984). The practice of quantitative modeling is not represented in this study because of its lack of applicability in higher education and academic libraries (Massy, 1996).

In this study, extensive libraries are assumed to have additional sources of income beyond the university/library operating budgets. Library monies raised annually often originate from many sources such as individual donor contributions in the form of cash gifts, gifts-in-kind, and bequests; and grants from corporate and philanthropic foundations (Browar & Streit, 2003). The role of the library foundation which is often a separate nonprofit entity has not been included in this discussion of library resource allocation in this study.

The population of this study will be limited to the directors of the 151 extensive libraries in the US as classified by the Carnegie Foundation for the Advancement of Teaching (2002). The Integrated Post-secondary Education Data System (IPEDS) defines doctoral/research universities (extensive) as institutions that typically offer a wide range of baccalaureate programs, and are committed to graduate education through the doctoral

degree. These institutions award 50 or more different doctoral degrees per year across at least 15 disciplines.

### Key Terms

There are terms used within this dissertation that relate to the fields of economics, higher education administration, and library management. These are defined in Appendix A.

### Summary of Methodology

A four part, precoded questionnaire was developed through literature reviews from Lasher and Greene's (2001) budget strategy summaries, Morgan's (1984) resource allocation models, and Sizer Warner's (1998) manual for budget administration for librarians to collect the data on what library directors are doing to manage their scarce resources. To ensure the strength of the questionnaire, the instrument was pretested for budgeting lexis comprehension and a pilot study was conducted to test the reliability of the instrument questions and scales.

The directors were questioned on their frequency of use of different budgeting activities to manage their operating budget and library directors were prompted to specifically identify the resource allocation strategy(s) they employ to budget. Using a budgetary activity sorting matrix developed for this study, directors' budgeting activities were categorized by budgeting strategy. This study determined if reported director activities corresponded with the budget strategy(s) that each director identified as currently in use. Library directors were asked to comment on the internal and external pressures of their financial environment. Whether or not the director selected a hybrid budget strategy or commented on any complex conditions in the library is of particular

interest in the data analysis as a means of identifying and understanding library resource allocation in private and public universities.

This study determines if: (a) the percentage and frequency distribution of resource allocation activities and strategies in use, (b) whether or not the director selected a hybrid budget strategy(s) and (c) comments on any complex conditions in the library are of particular interest in the data analysis as a means of identifying and understanding the context of library resource allocation in private and public universities. Other demographic information was collected from the questionnaire to provide descriptive data and develop a detailed profile on library, university and student size, and the age, gender, and financial education of the library administrator.

To process the questionnaire data, the researcher calculated the percentage and frequency of use of budgeting activities used by extensive library directors. Microsoft (MS) Excel and Statistical Package for Social Sciences (SPSS) were the primary software programs used to analyze the data. By using frequency and percentage distribution, this study identified the resource allocation strategies of these library directors and the frequency by which these strategies were used.

The type and number of budgeting strategy(s) used by directors was analyzed in three distinct ways. First, a budget activity sorting matrix was developed to identify the directors' budgeting activity selections for patterns of use. Self-reported respondent activity responses were categorized and matched with the applicable resource allocation strategy(s). A standard error of measurement (SEM), a measure of the spread of the directors' frequency scores, was calculated twice above the composite mean for each of the six budgeting strategy subsets. The SEM was used to develop a basis for comparison

to determine which budgeting strategy(s) the director was using based upon his or her activity selections. Frequency and percentage distribution for the sorting matrix results were calculated. Second, library directors were also asked to specifically identify by name the budget strategy(s) employed in the management of the library's general operating budget. From participant responses, the data were examined for budgeting strategy use as directly selected by the participants by using frequency and percentage distribution. The two methods were compared for similar or dissimilar budgeting patterns. To test the hypothesis that library directors only use one budgeting strategy, a chi square goodness of fit test, using SPSS, was conducted to discover any indication of hybrid strategy use.

Open ended structured questions provided narratives of any internal and external pressures that the library director experienced in the budgeting process of the library. The method of analysis used for the open-ended responses was an adaptation of Auerbach and Silverstein's (2003) exploratory content analysis. Participant responses were analyzed for emerging themes and common patterns. The analysis was completed by returning to the literature to review theoretical constructs related to the research.

The complete descriptive research plan including an overview of descriptive research, the characteristics of the study population, questionnaire development, data collection, and data analysis procedures is found in Chapter 3.

#### Dissertation Overview

In Chapter 1, the following research questions have been identified:

1. What resource allocation strategies are used by the directors of doctoral/research university (extensive) libraries? Which strategies are most and least frequently used? From participant responses, does the use of a hybrid mode emerge?
2. What are the internal and external conditions of the library environment that precipitate the use of such strategies?

In Chapter 2, a literature review presents a concept map on resource allocation, examines library budget design, defines the six resource allocation strategies and activity relationships, and analyzes the existing research on resource allocation and budgeting in academic libraries and similar nonprofits. Chapter 3 presents a descriptive research plan. Chapter 4 presents the results of the questionnaire data, primarily in Table form, and Chapter 5 presents final conclusions and recommendations.

## CHAPTER 2: LITERATURE REVIEW

Limited resources and increased demand for services have forced the directors of extensive libraries to make complex choices about the amount of goods and services offered to faculty, students, staff, alumni, and community patrons. The 2001 ACRL Focus on the Future Task Force identified higher education funding as one of the top seven important issues facing academic libraries (Hisle, 2002). Few empirical studies characterize the types of strategies used to allocate resources in extensive libraries today (Bremer, 1994; Cope, 1987; Garvin, 1980; Hayes, 1993; Jacob, 1990; Keller, 1993; Lui, 2003; Massy, 2003, 1996, 1990; McClure, 1981; Schmidlein & Milton, 1990; Shulock & Harrison, 1998).

This study develops an identification and understanding of what library directors are doing to manage their limited resources to support faculty and student academics in the current challenging environment. This chapter includes a discussion of the purpose of the literature review, the definition and limitation of the literature review, a review of the financial history of academic libraries with a budget primer, a description of the resource allocation conceptual framework, a concept map used to organize the diverse literature and a synthesis of the empirical data of the existing research on resource allocation strategies and budgeting in academic libraries and similar nonprofits.

### Purpose of Literature Review

To describe the current knowledge of the resource allocation problem in libraries, one must possess knowledge of “peripheral investigations” (Leedy, 1993, p. 87). To comprehensively review the literature in this way, the fields of economics, political science, higher education administration, as well as library management were searched

through The George Washington University's Gelman Library and its ALADIN portal with access to over 200 databases for relevant empirical studies for this study. Relevant databases for this review included ProQuest, JSTOR, Academic Search Premiere (with access to over 5000 journals), NCES, ERIC, and the US Department of Education. Key word searches included: (a) higher education administration, (b) library budgets, (c) resource allocation strategies and models as well as (d) financial and library management. Searches by significant authors were included.

This literature review serves a number of purposes. First, this chapter traces the history of academic library finance with a brief introduction to library budgeting. The conceptual framework of Morgan's resource allocation decision making models is reviewed to address the context and scope of the study's research problem. Lastly, current empirical data are presented visually in a concept map. A detailed description of the six resource allocation strategies in question make up the largest part of this examination. Previous research studies on budgeting and resource allocation will be critiqued for relevance, quality of methodology and validity of presented interpretations.

#### Definition and Limitation of the Literature Review

Many studies on library finance do not directly address resource allocation strategies but concentrate on the budgeting process in general terms of efficiency. Many authors have performed a microanalysis of numerous resource allocation problems in libraries as it relates the specific areas of materials budgets, special collections management or acquisitions (Allen, 1996; Allen & Dickie, 2007; Baker, 1992; Birdsall, 1995; Brower & Strait, 2003; Campbell, 1994; Clayton, 2001; Edwards & Schulenburger, 2003; Ellis-Newman, 2003; Goudy, 1993; Griebel, 1996; Hearn, et.al, 2006; Holt, 2000;



Kleiner & Walker, 1975; Saunders, 2001; Stubbs, 1994; Sloan, 1999; Waldhart, 1978).

Various studies address resource allocation in higher education or nonprofits but libraries are just part of the larger economic community. This review presents the most available and relevant literature on resource allocation and libraries for this study. It is a further delimitation of this literature review that the resource allocation strategies used to develop the library operating budget is the focus of this research. An operating budget is defined as being composed of unrestricted funds and the core budget of the library (Evans, 2001; Lasher & Green, 2001).

### History of Academic Library Finance and Budgeting

In the United States, the academic library has a colorful history. Even though libraries existed before universities, the modern academic library predicament seems to mirror the development of higher education itself (Weiner, 2005). Through a process of growth, assimilation and diversification, the library has evolved as priorities for institutions have evolved (Shiflett, 1994; Weiner, 2005). Noted academic library historian Lee Shiflett contends the library has prospered or suffered in proportion to its value to the college. Into the 20<sup>th</sup> century, the university library grew more sophisticated with emphasis placed on increased student and faculty library use, the rise of literary societies and the recognition for the need for specialized library services. Financing the library was accepted as a necessary expense of the university (Radford, 1984).

Over the years, the library director has been challenged by the various conditions of change that impacted the library budget. In the 1970s, poor economic conditions pressured library management to maintain services as institutional funds were decreased. Technology first appeared on the horizon to change the academic library with the rise of

OCLC “WorldCat” in 1972. In the 1980s, federal support of academic libraries diminished just as technological developments were destined to redefine the very nature of the library. In the 1990s, the severe inflation that led to a general retrenchment of all university funds deeply affected the library’s ability to provide goods and services. In the last two decades of the 20<sup>th</sup> century, academic libraries underwent tremendous changes. New technology initiatives, growth in degree programs, changing usage patterns and a serials pricing crisis has created a genuine need for improved financial decision making (Miller, 2000).

Academic libraries have long struggled to remain on the cutting edge of supporting faculty and student scholarship while maintaining accreditation standards (Balderston, 1995; Birnbaum, 2001; Budd, 2005; Changing, 2006). However, despite these general trends in funding, the development of the library budget is still a relatively predictable process even if the decision making is not (Hughes et al., 2000). Far from the early days of the twentieth century when bills were once placed in the college treasurer’s shoe box marked “paid or unpaid”, the decision making system for purchasing goods and services has evolved into a routine, albeit complex, budgeting process for private and public institutions alike (Birnbaum, 2001; Lasher & Greene, 2001).

Budget development is usually “top down” where budget preparation starts from the “bottom up” (Evans, 2001; Lasher & Greene, 2001). At public institutions, budget instructions from the state are the guidelines used to create individual institutional budget development strategies. Budget development at private institutions is mostly directed by economic conditions and university leadership goals expressed by both the president and the library director. The bottom up process of budget preparation usually begins with

first-line library supervisors who send their estimates and requests to middle and top management for review. Each consecutive level further coordinates these budget estimates and sends this information to top management which includes budget directors, library directors, and deans, and ultimately, the chief financial officer to determine the general budget for the library.

Evans (2001) asserts that there are four basic issues in library budget preparation. The first challenge for library management is to provide goods and services within the context of the established budget and changing needs. Second, the budget must satisfy the requirement of increasing print collections. Evans notes that even as public libraries have the luxury of withdrawing outdated items, the academic library must build its archives. Third, customer access to these materials must also increase. Lastly, the addition of new staff and the maintenance and increase of existing staff salaries are crucial budgeting constraints.

Real library leadership involves a director's willingness and ability to make difficult decisions at the right time. According to Holt (2000), the most difficult decisions involve staff and budget crafting. In 1998, the AAU Summary of College Costs Commission Report concluded that to manage these enormous financial constraints, academic libraries were making the following adjustments:

1. Reducing the number of journal and other material subscriptions.
2. Eliminating duplicate departments and any other redundancies.
3. Eliminating individual subscriptions campus wide.
4. Consolidating library services
5. Reducing support staff

6. Creating consortia to share bundles and joining consortia to share journal bundles

Controlling costs in the publishing world is characterized by bundling. “By combining the distribution of many journals into a single bundle, or database, the fixed costs associated with each individual journal can be spread to a large reader base” (West & Stromgren, 2003, p. 953). All of these reported adjustments demonstrate that as the library has evolved over time, the economic environment has grown more complicated. From the top to the bottom and back again, the library budget is often forged years before its implementation date in order to better address and accommodate the library’s needs. Library administrators must be poised to rise up and meet these fiscal challenges.

#### Morgan’s Models of Rationality and Market Interaction

The primary basis for the conceptual framework of this study begins with the assertion that resource allocation is simply the complex process of decision making. As it relates to this study the decision is established by finding; (a) how do library directors decide which materials and services will be provided to library patrons? (b) which manner of decision making will guide the library director’s actions and choices? The ACRL promulgates standards and guidelines to help libraries, academic institutions, and accrediting agencies understand the components of an excellent library. The ACRL guidelines (2006) include the statement that libraries should be administered in a manner that permits and encourages the most competent use of available library resources.

Morgan’s (1984) models of resource allocation decision making undergirds the framework of this study of academic library budgeting. According to Leslie (1984), Morgan compacted dozens of budgeting strategies and simplified resource allocation in

that really “the choice in budgeting strategies is between (two) those that optimize the fundamental tenants of modern management science--effectiveness and efficiency--and those that complement the realities of organizational political environments” (p. 2). Essentially, the question is whether an administrator will decide to use a transparent, rational method to make resource allocation decisions or rely instead on individual experience and collegial or hostile advice to make those same allocation decisions. The first model is the rational calculation view and the second model is called the market interaction view, which is often referred to as the political view. Resource allocation strategies from the rational view include formula, program/planning, programming and budgeting system (PPBS) and zero-based budgeting (ZBB) or target-based budgeting. Market strategies include incremental line item, performance or incentive, and responsibility or cost center budgeting. Rationality and market interaction strategies describe the way in which library administrators’ practice budgeting activities.

### *Rationality*

The first set of Morgan’s (1984) assumptions is the rational calculation view. Rationalism and the search for the optimal resource allocation decision are the assumed underpinnings of these resource allocation strategies. Rational calculation encompasses the notion that resource allocation decisions can be made transparently and efficiently. According to Friedmann and Hudson (1974), a resource allocation decision is considered rational when it arrives at a single best answer. Many studies in higher education have concentrated on the role of rationality in resource allocation. Rationalism drives the manner in which inputs are allocated for scarcity minimization. Rational calculation encompasses “the notion that resource allocation decisions can be made best by relatively

few individuals using an intellectual calculus for collecting and analyzing relatively objective information” (Morgan, 1984, p.6). Lindblom (1959), Simon (1964) and Wildavsky (1979) contributed rational decision theory which describes individuals trying to make the choice that maximizes value.

Rational strategies were developed to optimize the use of available, limited funds and to accomplish rationing. Because of limited financial resources and increased demands for services, the directors of large research libraries are encouraged to practice efficient resource allocation by using increasingly transparent and ostensibly rational budgeting strategies (Clayton, 2001; Jarzabkowski, 2002; Lynch, 1985, 1989; Marchant, 1976). Zero based budgeting, program/PPBS, and formula budgeting are examples of rational resource allocation strategies. As compared to politically based strategies, rational strategies are most recommended by the economic, higher education, and library administration literature.

#### *The Role of Planning and Budgeting*

Resource allocation strategies based on rationality rely on the major assumption that budgeting and planning are complements within the model (Morgan, 1984). The literature confirms a call for direct planning and budgeting linkages for efficient allocative decision making as an “unquestioned article of faith” (Schmidtlein, 1981, p. 415). Given the role of planning in an institution of higher learning, this is not an unusual claim. Academic institutions plan their futures to fulfill aspirations of better students, better faculty, better facilities, and better reputations (Curry, 2000). In addition, a basic assumption of the rationalist school is that decisions relating to proper allocation of resources precede an action and planning is identified with advanced decision making

(Robinson, 1972). Friedmann and Hudson (1974) define planning as a set of methods designed to prepare information in such a way that decisions can be made more rationally (Johnston & McNamara, 1975).

There has been much emphasis placed on establishing clear ties between planning and budgeting in higher education (Bowen, 1986; Lasher & Greene, 2001; Schmidlein, 1989). Lasher and Greene (2001) assert that planning is fixed in the theory side of an institution's program whereas budgeting exists more on the practical side. Bowen (1986) argued that planning and the budget process should be a closely linked process. Planning allows administrators to consider all resource allocation needs at the same time. With all recognized choices on the table, appropriate planning would allow the administrator to calculate the implicit and explicit expenditures and select the choices with minimal opportunity costs associated with the decision. Dropkin and LaTouche (1998) contend that careful attention to the budgeting process leads to greater financial stability, operational effectiveness and efficiency, and responsiveness to organizational needs and priorities.

The ACRL includes formal planning procedures as a part of its criteria for judging the minimum standards of a library that operates in higher education (ACRL Board, 2004). The ACRL guidelines maintain that planning procedures help libraries in higher education clearly define a vision and mission, set goals and objectives, and implement specific strategies or courses of action to help meet those ends. Costs must be determined for each objective, regardless of the level of funding available or its source. Yearly priorities are identified because completion of the objectives will take multiple fiscal years and are likely to consume more library funds than are immediately available.

After costs are determined and priorities established, an implementation plan can be established. This is a very critical management need of any library plan: determining what is going to be done, when, and how much of what resources will it require (Dugan, 2002).

For all the benefits of planning, this study would be incomplete without citing the large body of literature which denounces the perceived benefit of planning. Chaffee (1981), Schmidlein (1989, 1990), and Wildavsky (1974) challenge the notion that there are clear links between planning and improved resource allocation. The major weakness of planning is that overly complicated strategies tend to dilute the resource allocation process. Planning is dependent upon the correctness of information. If the information that the plan is based upon is incorrect, the planned course of action could be flawed. Other disadvantages to planning have been described as limiting flexibility and stifling creativity (Chaffee, 1981; Schmidlein, 1989).

Regardless of the role of planning, there is consensus that the two key ways to describe resource distribution are the rational and market interaction models (Leslie, 1984). Pfeffer, Salancik, and Lebelbici (1976) postulated that university level decision making will follow a rational process when well defined standards are available. In the absence of these standards, a process of social influence will ensue. The set of assumptions called the market interaction view defines the impact of social influence and the resource allocation process.

#### *Market Interaction*

Resource allocation strategies based on the market interaction or political model support the need and validity of decentralized decision makers and the importance of



political forces (Wildavsky, 1973, 1996). These allocation strategies were developed to be more responsive to institutional conditions where coalition building and bargaining accomplish resource allocation. The complexity of social relationships in universities is another complication of allocation choices (Birnbaum, 1988; Massy, 1996). Bolman and Deal (1991), Birnbaum, (1989) and Cyert and March (1963) concur that political organizations are composed of alliances which are bargaining with each other. Morgan's market interaction view also describes how the rationing of resources generally occurs in competitive institutions.

The process of competing for resources, whether real or symbolic, and the determination of who secures those resources are at the core of the market interaction model (Wildavsky, 1973). The model is assumed to be very subjective and highly political. Zemsky, Porter, and Oedel (1978) reject the rational calculation view as an adequate response to stressed, dynamic conditions: "Technical models, budgetary projections, anticipated income and expense flows, for all their technical refinements, never capture the sense of flux and change that characterizes educational financing" (p. 229). In periods of intense change and pressure, it is unclear if the administrator chooses market determinants to resolve resource allocation challenges. Incremental, responsibility/cost center budgeting, and performance budgeting are examples of strategies based on these focus on incentives and the free play of market forces.

#### *Rational versus Market Approaches to Resource Allocation*

An examination of the rational and market interaction models of resource allocation provides an opportunity to understand the strengths and limitations of the two types of allocation strategies and to understand the gaps that both fail to fill. One might

differentiate the rational versus the market interaction model as a debate on centralized or decentralized decision making which is often discussed in resource allocation literature (Rodas, 2001). However, even after studies on the importance of whether or not the university administration is making the decisions or if the operating units are, nonfinancial issues complicate the environment (Geiger, 2003). Flexibility emerges as a relevant example of a nonfinancial issue that affects both the rational and market interaction model assumptions.

The need for flexibility is a key to the implementation of all resource allocation strategies. According to West and Stromgren (2003), institutions need to overcome strong bureaucratic tendencies that prevent the development of the kinds of flexible and efficient working relationships that are prerequisite to success. Jarzabkowski (2002) suggested that all forms of resource allocation models are inherently problematic when carried to extremes, and that flexibility is key to the changes in the university and the wider environment. Perhaps, if in this study, library directors are found to use more than one budgeting strategy for the management of the operating budget, it could be construed as a sign of the use of flexibility in implementing budgeting tools so that desired results may be achieved?

Despite the many opinions about the conditions that encourage resource allocation, the fact remains that resource allocation strategies, based on rationality or market interactions, have a “checkered past.” Difficulties predicting future needs and environmental problems may be just a few of the reasons why any one allocation practice may not be sufficient to handle all the complex issues in budgeting (Schmidlein, 1990). Birdsall (1995) describes budget development as *both* a technical and political process.

Morgan (1984) asserts that “there will always be those who lean toward tempering quantitative evidence with judgment and those who favor tempering judgments with quantitative evidence. Each view is legitimate; we can only hope to move toward an appropriate balance” (p. 18). It appears that rational resource allocation strategies will never fully eliminate the politics of the process.

Rational and market strategies, flexibility, and creativity are all relevant to the resource allocation discussion (Cates, 1979; Jarzabkowski, 2002). Morgan does not conclude that rational resource allocation is more efficient than market interaction allocation. He does suggest that “superior institutional solutions will reflect a synthesis of the two models” (Leslie, 1984, p. 3). However, Birnbaum (2001) concludes the only way definitive conclusions can be drawn about resource allocation strategies is through research and “no such research has been done” (p. 167).

By identifying resource allocation strategies that describe the current budgeting activities in use, an in-depth look into resource allocation will be developed with the library directors providing the basis for an improved understanding of library management and the budgeting of scarce resources in complex economic conditions. An identification of budgeting strategies will provide library administrators with an introspective look into resource allocation and the study and review of internal budgeting activities will provide at the very least, a catalyst for important dialogue about budget strategies, activities, and improvement (Birnbaum, 2001; Lewis & Dundar, 2001).

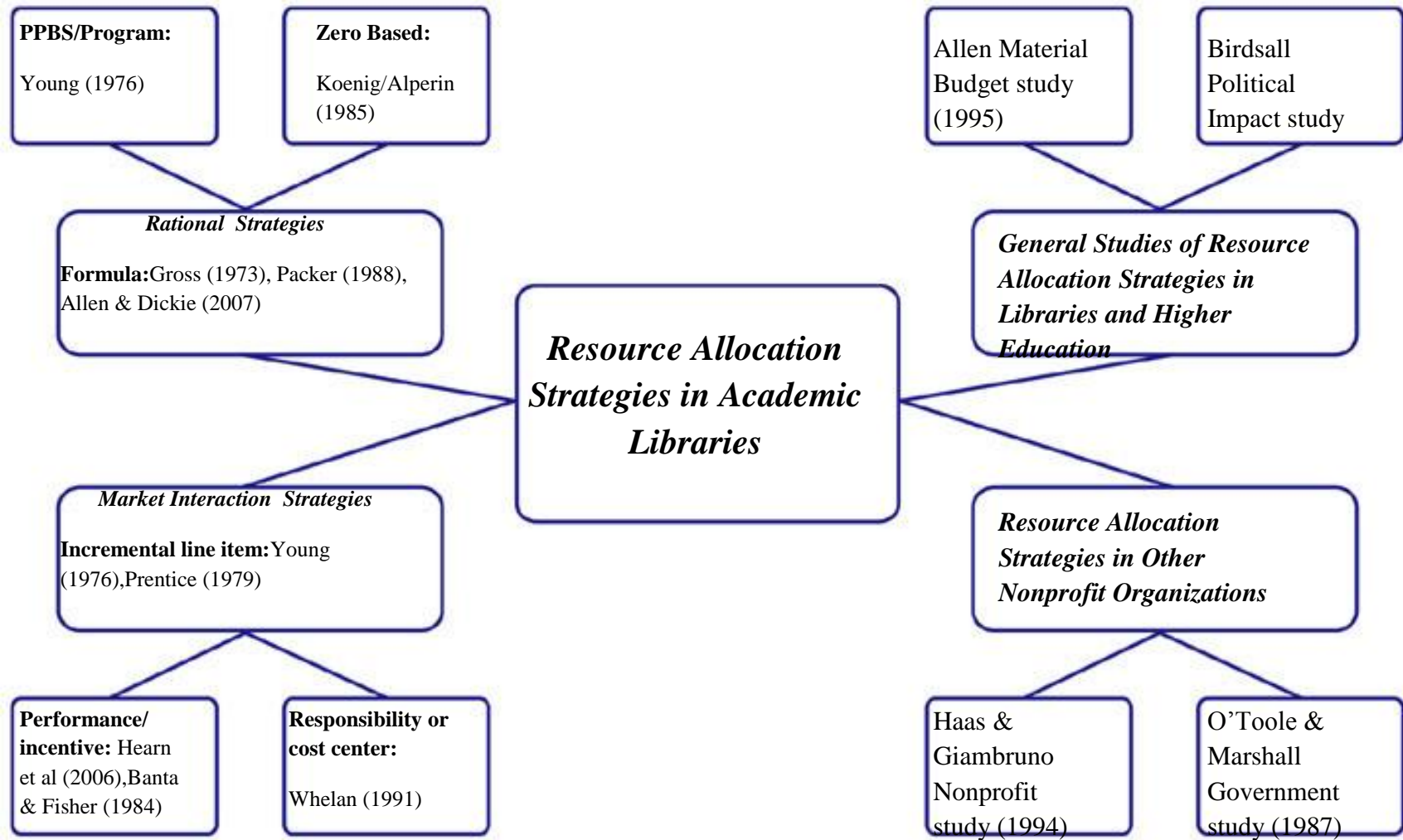
### The Concept Map

To categorize the diverse literature on resource allocation and academic libraries, a concept map, as illustrated in Figure 2, was developed to organize the literature and

facilitate understanding. Concept mapping can be used to communicate complex ideas and facilitate knowledge elicitation (Novack, 1991; Trochim, 1989). Concepts are routinely enclosed in nodes. The relationships are indicated by a line, or a link, that connect two concepts.

Research allocation strategies in academic libraries is the central node in the illustrated concept map. From the central node, the six strategies outlined in this research are linked from the left and categorized by rational and market interaction based strategies. Each strategy is defined with relevant research presented. General studies on resource allocation strategies in libraries and higher education are linked from the right of this central node. Allen and Birdsall's (1995a, 1995b) studies are the key articles of this section. Because there have been two well-designed studies about resource allocation strategies in other types of organizations, the last concept to be discussed will be the resource allocation strategies within nonprofits and local governments. Haas and Giambruno (1994) and O'Toole and Marshall's (1987) studies highlight the final section of the concept map.

Figure 2  
*Concept Map*



## Resource Allocation Strategies in Academic Libraries

This section of the literature review will present definitions and relevant studies of six resource allocation strategies. The following shall be examined: (a) formula budgeting, (b) program budgeting (PPBS), (c) Zero-Based budgeting (ZBB), (d) incremental line item budgeting, (e) performance budgeting/Incentive budgeting and (f) responsibility/Cost center budgeting.

These six strategies represent the body of the most applicable and well-defined strategies as noted by Caruthers and Orwig (1979), Dubeck, (1984), Leslie (1984), McKay (2003), and Meisinger and Morgan (1984). The above listed resource allocation strategies will be defined and activities indicative of each will be described. Strengths and weaknesses of each strategy and its use in academic libraries will also be reviewed. Rational strategies will be addressed first and include formula, program (PPBS), and zero based budgeting.

### *Rational Strategies*

*Formula budgeting.* As defined by Caruthers and Orwig (1979), formula budgeting is the strategy of applying one or more mathematical formulas in the budgeting allocation process. First seen in 1951, four states developed formula approaches to budgeting as a way for public institutions to develop appropriations requests. That number jumped to 22 states in 1977 as reported by the Kentucky Council on Higher Education (Lasher & Greene, 2001; Leslie, 1983). In general terms, a budget formula is the way to fund needs based upon estimations of cost. The budgeting method is enrollment driven where full-time equivalent (FTE) student percentages are calculated. These types of institutional data are calculated mathematically to arrive at dollar

estimations to cover future costs. By relying on quantitative measurements, the budget appears to be more rational and objective. Other strengths include providing an equitable distribution of resources, minimizing political conflict in the budgeting process, and enhancing the uniformity of the budget (Lasher & Greene, 2001).

Morgan (1984) categorized formula budgeting as a cost reimbursement decision making strategy. Historical data and projected trends are used to develop mathematically based relationships for budget formulation. Common in state institutions, state appropriations are linked to different institutional characteristics from student enrollment to work load (Brinkman, 1984). After the subjective nature of formula creation is considered, these formulas can be routinely applied to the decision making process in ways that increase rational decision making and decrease political influence on budget creation (Lasher & Greene, 2001; Morgan, 1984; Packer, 1988).

The commonly associated weaknesses of formula budgeting include the inflexibility of mathematical calculations and the inability to include qualitative factors such as institutional mission. Other weaknesses include the use of questionable criteria and measures, and the time consuming, complex calculations (Lasher & Greene, 2001). Formula budgeting activities include: (a) using a budgeting framework driven by student enrollments and cost estimations, (b) using complex mathematical calculations using full-time student equivalents to calculate the budget, (c) relying heavily on quantitative variables to estimate costs and required funding in budget formulation, (d) relying on quantitative measurements and performing technical budget calculations that appear rational and (e) performing mathematical calculations to provide an equitable distribution of library resources.

Gross (1973) conducted a comparative analysis of the existing budget formula used for justifying budget requests or allocating funds for the operating expenses of 100 randomly selected state-supported colleges and universities. Of particular note to this study is the researcher's distinction in his questionnaire between the institution's use of formulas to allocate funds and the use of formulas to request funds. This presents a subtle weakness of formula budgeting that suggests that even after formula are used to request funds, an alternative method without the use of formulas may actually allocate them. Brinkman (1984) asserts that formulas are often used more as a matter of "ritual than of substance" (p. 24).

Packer (1988), Head of Collection Services at Western Washington University Libraries, presented a case study of the use of formula in the acquisition allocation process. The study included a detailed literature review of the then current library acquisition formula from 1969 to 1983, which included multiple correlations, linear programming, multiple regression analysis, constrained optimization, and other eclectic methods. In 1983, Western Washington University Libraries were faced with a need to create controls for new serials acquisition while simultaneously embracing an inability to purchase new monographs. Success three years later was achieved by reviewing over 60 variations and then using a combination of formula that ultimately allowed the institution to continue fiscally by dividing disciplines. This process was slow. On an interesting note, although the formulas were rationally based on student enrollment data and faculty size calculations, consensus building (a characteristic of market based strategies) was key to implementing the resource allocation practice. This juxtaposition puts the use of hybrid strategies as a curious point of issue in her study. Packer claims librarians must put into



place “allocation schemes that display fiscal accountability in considerable detail and that the Library Director should guide the development of long-range defensible policies” (p. 285). As with any case study, the weakness of Packer’s research includes findings with limited generalizability to larger populations.

Allen and Dickie (2007) presented their formula budget research at ACRL's 12th Annual National Conference in April, 2005. Allen and Dickie asserted that libraries represent a microcosm of a university with a large staff, operational and program driven costs, and no agreed upon allocation scheme. The researchers examined 10 specific data points (over 11 years) from 100 conveniently selected ARL libraries. Allen and Dickie developed a formula-based model for academic library funding. The model for ARL libraries established a foundation for what could evolve into funding strategies based upon measurable inputs. Their research question focused on what factors should drive library budgets.

Incremental, informed judgment or nonrecurring allocation bases were beneficial in good times but detrimental in bad times. Allen and Dickie also found that academic libraries often use haphazard funding mechanisms, and that there was a significant lack of empirical data on funding mechanisms for the academic library as a whole. The researchers suggested that the expected strength of formula based models was predictability. Allen and Dickie admitted that this model may not be as effective for mature institutions with steady growth rates and that the formulas did not seriously address the crisis related to serials inflation.

*Program budgeting.* Program budgeting (PPBS) was first developed as an alternative to incremental budgeting by creating a budget for a particular program instead

of an entire department (Lasher & Greene, 2001). Funds are allocated toward goal achievement via programs and the managers at all levels who plan and control program functions (Wacht, 1984). A clear connection between the means to a budget and the goal exists. The purpose of the budget is to better understand programs and how they work. The most common strength of program budgeting is the ability to incorporate qualitative variables such as mission into the budget.

Broad policies are transformed into operating plan elements through a centralized, vertical decision making process. Planning, budgeting, and cost-benefit analysis are all formal components of the budget along with alternative activities with associated costs which are formulated to better meet resource allocation goals. The budget matches the resources that lead to specific outputs. According to Lasher and Greene (2001) the most common weakness of this strategy is the difficulty in its implementation and the exceedingly formal budget document. Program budgeting activities include: (a) utilizing a budgeting framework driven by library activities and outputs, (b) budgeting to support specific library and university programs, (c) providing a means to the library's end goals by using the budget to manage outputs, (d) considering alternative activities with associated costs to better meet program goals during the budgeting process and (e) planning, budgeting and performing a detailed cost-benefit analysis to develop the library's budget.

Morgan (1984) categorized program budgeting as a rational-deductive decision making strategy. The planning, programming and budgeting system (PPBS) is a well known example of program budgeting and an integrated, comprehensive budgeting system initially developed by Rand for use by the Defense Department (Birnbaum, 2001;

Weathersby & Weinstein, 1970). A rational process, PPBS, includes analyzing goals, comparing costs and benefits, and choosing the most effective alternative usually where the benefits outweigh the costs of the choice in question. Within a single, coherent process, PPBS, combines all long-range planning and budgeting; creation of operational plans and budgets based on performance, personnel, and capital budgets; budget modifications and augmentations; and facilities management and development (Schroeder, 1973).

In the early 1970s, PPBS was praised in various literatures as an ideal approach to better decision making. Young (1976) examined the use of PPBS in ARL institutions. Questionnaires were mailed to 78 randomly selected ARL university libraries with a return rate of 94%. Twenty respondents had begun the process of implementing PPBS. However, the development difficulties of PPBS as a resource allocation practice in libraries proved overwhelming and when Young contacted library officials again, 19 of the 20 libraries had discontinued PPBS.

Although used by the University of Pittsburgh, Princeton University and the University of Utah, PPBS has not been used extensively and there is a lack of empirical data on PPBS in higher education. Although few PPBS applications exist and are negatively viewed by Wildavsky (1974), Birnbaum (2001) states that PPBS has had a positive impact on higher education by forcing institutions to rethink the way programs, goals and objectives are analyzed.

*Zero-based budgeting.* Zero-based budgeting (ZBB) was developed by Pyhrr while at Texas Instruments in the late 1960s (Birnbaum, 2001; Chen, 1978; Lasher & Greene, 2001). The ZBB practice focuses on the microeconomic problem of transforming

objectives into operating plans (Caruthers & Orwig, 1979). The two basic steps in ZBB are the development of decision packages and the ranking of decision packages (Tierney, 1981). Morgan (1984) categorized ZBB as an investment or marginal utility decision making strategy. Marginal utility is the change in total satisfaction derived from one additional unit of a good or service (McConnell & Brue, 2001). Because the value of additional goods and services is found “in the margins,” performing a cost benefit analysis is imperative to ZBB decision making.

The most common strength of ZBB is its applicability to new programs where budgets need to be created anyway for an equitable distribution of resources. Goals and objectives are evaluated by starting over every year and budget minimums are not assumed. The need for resources is justified in the budgeting process every year. Budget history is not taken into account for the development of the current budget. The costs and benefits for every budget activity are always considered in the budgeting process. Potential budget activities are categorized and are priority ranked every year. Budget decisions are formal written documents that are considered during the budgeting process.

The most common weakness is the administrative paperwork needed to implement the practice. The budget method does not easily allow for continuing commitments and the budget is exceedingly formal. The budget documentation is large, complex, and time consuming. Criteria and measures may be questionable and are not quantitative in nature. Balderston (1974) noted “the zero part of zero-base budgeting may simply be an agonizing charade and would not be worth the trauma” (p. 216). Massy (1996) admits that his use of ZBB as a way to strip away old budgetary assumptions led

to an overwhelming amount of paperwork that was never completed. ZBB budgeting activities include:

1. Utilizing a budgeting framework driven by the need to justify resources for priority ranked activities.
2. Evaluating goals and objectives by starting over and assuming no budget minimums to develop the operations budget.
3. Categorizing potential budget activities and priority ranking them prior to being included in the budget, every year.
4. Considering the costs and benefits for every budget activity in the budgeting process.
5. Omitting budget history for the development of the budget.
6. Justifying the need for resources as a formal, written part of the library's budgeting process.
7. Considering the costs and benefits for every budget activity as a part of the library's budgeting process.
8. Using statements of goals and objectives to explain why and how money is being spent in the library.

Koenig and Alperin (1985) studied the effectiveness of both PPBS and ZBB in libraries. The authors conducted 45 telephone interviews with administrators of randomly selected academic and public libraries. Twenty-seven percent were using a form of program budgeting and 12% were using ZBB. Because of the complicated development of PPBS and ZBB, librarians found these strategies difficult to implement. Although both strategies ensure that the budgetary process is managed effectively, the process is

exceedingly formal. ZBB has many of the same benefits of PPBS where planning is required before budget preparation and the budget is tied to the goals of the organization (McKay, 2003). No follow up study was ever performed by Koenig and Alperin.

Chen (1978) published seven case studies on ZBB. Chen presented each case study with the background conditions of the library that led to the use of ZBB and offered sample ZBB materials as provided by the librarians under review. Although enthusiastic about the promise of ZBB at these libraries, Chen's case studies are limited and a follow up study was never performed to describe if any of these libraries continued using ZBB.

Birnbaum (2001) explains that libraries lagged behind their universities and tried to implement ZBB as universities were discontinuing its use. With a lack of recent empirical data, it is understandable how most researchers assume that ZBB was embraced in the 1970s and was given up by the 1980s. Despite all the attention given to such concepts as PPBS and ZBB, Evans (2001) suggested that "most governmental budgets are basically line budgets. Even when a local jurisdiction attempts to move into one of the newer budgeting modes, the end results is the same – [*sic*] an incremental budget" (p.21).

Although the idea of continually justifying funds may appear beneficial, especially to institutions paralyzed by the status quo, ZBB as a process may actually divert administrators from solving any problems (Chaffee, 1981). Disturbingly, Birnbaum (2001) has said that "no reliable data that indicate the number of colleges and universities that use or used ZBB exist" (p. 57). This study seeks to identify the use of ZBB among extensive libraries today.

Rational strategies previously described include formula, program/PPBS, and ZBB. Market interaction strategies such as incremental line item, performance or

incentive, and responsibility or cost center budgeting will be addressed in the next section.

### *Market Interaction Strategies*

*Incremental line item budgeting.* The oldest form of allocation is the incremental budget. Expenditures are presented in line order of major expenditure and are simplistic in nature (Vandement, 1989; Welzenbach, 1982). Lindblom's (1959) analysis of incremental decision making is by far the most widely known as the "process of muddling through (p. 1)." Incremental budgets rely on last year's budget with special attention given to a narrow range of increases or decreases. Competition among budget participators is limited. Warner (1998) comments that incremental budgeting is so common that "once a line, always a line" (p. 9). This approach prospers in a very stable institution, one which is not affected by environmental change nor is interested in impacting its environment (Cates, 1979; Lasher & Greene, 2001). Morgan (1984) categorized incremental budgeting as an interest group bargaining strategy where all parties involved in the allocation process bargain for a share of resources.

Strengths of the budget method include budget alternatives set to a reasonable limit, trends in certain budget lines predicted with a fair amount of accuracy and confidence, and budget lines accountable for long-term financial commitments. The budget method always assumes certain cost minimums for the library to function. The budget minimizes political conflict in the budgeting process. By relying on last year's budget, the budget method conserves time and energy (Lasher & Greene, 2001).

Critics of incremental budgeting disagree with the basic tenet that the previous years' budget was properly distributed (Caruthers & Orwig, 1979). Wildavsky (1974)

believed incremental budgeting to be a perpetuator of the status quo. Others (Vandement, 1989; Welzenbach, 1982) suggested that incremental budgeting was politically passive and viewed as the weakest type of budgeting. Incremental budgeting provides little information about whether budgetary decisions support or reinforce institutional goals. End of the year spending to prevent the loss of under-allocated funds is another pitfall of the practice. New ways of allocating resources are often undermined by using a marginal budget analysis.

Although most literature in higher education and library management scorn the use of incremental budgeting, the approach has its advantages. It is the easiest methodology to understand and develop. From a political perspective, it creates the least conflict because each sub-unit begins with its prior budget. Keller (1983) maintained that the popularity of incrementalism stems from a common contemporary view that people are not rational. Pfeffer and Salancik (1974) maintain that the incremental approach is embedded in the campus political structure and is a method that works with surprising agreement. Incremental budgeting activities include:

1. Utilizing a budgeting framework driven by a base budget founded on last year's library budget.
2. Using a base budget completely founded on last year's line item data.
3. During the budgeting process, making slight increases or decreases to the base budget based on future trends and projections.
4. Setting budget alternatives to a reasonable limit.
5. Minimizing political conflict in the budgeting process by limiting competition among budget participators.



6. Making only marginal increases to certain budget line items to reflect new library initiatives in the budget.
7. Assuming certain budget cost minimums for the library to function.
8. Predicting with accuracy and confidence the likely trends in certain budget lines.
9. Accounting for long-term financial commitments every year.
10. Using a relatively simple approach to budgeting.

Young (1976) examined the use of incremental budgeting in ARL institutions. Questionnaires were mailed to 78 randomly selected university libraries with a return rate of 94%. Young reported an overwhelming majority of large academic libraries used incremental budgeting to allocate their resources. In a study of public library finance, Prentice (1977) reported that 75% of randomly selected public libraries used incremental budgeting. Young suggested that the high percentage of libraries dependent upon incremental budgeting should maintain a link to incremental budgets during the transitional years when they adopted other strategies. The fundamental criticism of both studies is that over 30 years have passed since those studies were first conducted with no published follow up research.

Even with calls for new approaches, most budgets in libraries are incremental (Evans, 2001). Every year, the *Library Journal* publishes periodical price questionnaires, which forecast future marginal increases of the components of library operating budgets. A unique feature of most library budgets is a large proportion of resources that support fixed, committed expenditures. Continuity of resources is essential both for planning and for meeting these continuing needs. Under these circumstances, it is not surprising that

incremental budgeting is a crucial resource allocation strategy. Most notable is the lack of recent studies. It would appear that the line-item budget is so familiar that it is often ignored in the literature (Ashford, 1981).

*Performance budgeting/incentive budgeting.* Performance and incentive budgeting are output focused resource allocation strategies. Performance budgeting is a very active part of the current budgeting trend in higher education (Lasher & Greene, 2001). Since its conception after World War II, linking performance to budget levels was not widely practiced. However, with the recent emphasis on accountability as related to quality issues, performance and incentive budgeting has become extremely popular (Lasher & Greene, 2001; Massy, 1996). Morgan (1984) characterized performance budgeting as a new structuring incentive decision making strategy. Schmidtlein (1981) defined performance budgeting as a method to develop budget requests. Peterson et al. (1977) defined performance budgeting both as a structure that focuses on activities that produce results and as a process that strives to allocate resources on anticipated results.

The most common strength associated with performance budgeting is the emphasis on results. Accountability and quality are represented in the budget by performance measures. During the budget process, activities (not objectives) are formulated and classified and performance measures are developed. Performance evaluations are reviewed prior to budget decision making. The most common weakness is the complex documentation needed to implement the practice and the failure of the budget to address all qualitative concerns (Lasher & Greene, 2001). Performance budgeting activities include:

1. Utilizing a planning and budgeting framework driven by library outputs, performance, and incentives.
2. Using appropriate, measurable criteria on which to judge performance to make budgeting decisions.
3. Using accountability and quality in the budget by the use of performance measures.
4. Relying heavily on performance measures and performance evaluations of expected activities rather than fulfilling library objectives.
5. Managing a university or externally mandated goal to which monies are exclusively connected but only if that goal is achieved.
6. Setting library goals to which monies are exclusively connected only if those goals are achieved.
7. Formulating and classifying activities (not objectives) to make budget decisions.
8. Developing performance measures to make budget decisions.
9. Reviewing performance evaluations to make budget decisions.

Although focusing on accomplishments and results is admirable, performance budgeting has a tendency to only measure what can be measured and avoid immeasurable variables such as mission and community services. Numerous calls from library management literature stress the need for accountability (Evans, 2001). Moran (2005) contends that the ability and willingness to measure results and make consequences visible are the key components to library resource allocation. According to Caruthers and Orwig (1979), the primary barrier to implementing performance budgeting at the

institutional level is achieving consensus on appropriate, measurable criteria on which to judge performance.

Performance or incentive budgeting is commonly used at the state level to promote the accomplishment of goals. If the university meets objectives, earmarked funds are distributed to institutions to share. Institutions are motivated to move in the direction of state goals and to avoid losing funds or regulatory action. Banta and Fisher (1984) provide a short case study of the Tennessee Performance Funding Project, which exemplifies performance budgeting. In 1979, the state of Tennessee added a performance funding feature to apply to all public colleges and universities with up to 5% of the state's instruction budget was allocated based on awarded specific institutional accomplishments. The weaknesses of incentive budgeting are very similar to performance budgeting. Critics would suggest that the strongest flaw of incentive budgeting is the importance of short-term goals without regard for long-term planning (Lasher & Greene, 2001). However, the criticism seems counterintuitive as this practice is specifically designed to encourage institutional compliance with state goals.

In 2006, Hearn, Lewis, Kallsen, Holdsworth, and Jones published an eight-year case study of the implementation of an incentives-based plan and budget at the University of Minnesota. Of particular note is that the University of Minnesota, a public research land-grant university, is the largest university to institute such a change. The published findings represent reflections of the changes to the educational environment during the early years of Minnesota's implementation of their hybrid designed Incentives for Managed Growth (IMG) resource allocation strategy. Formally introduced in 1997, IMG addresses the university's need for decentralized fund allocation to high-demand

programs, and the need for university leadership to control budgets as a means of conserving quality. This case study reveals several crucial points.

In 1999, an internal oversight committee provided the initial feedback on the IMG process. A formal, quantitative evaluation highlighted that less than 20% of the university's budget was allocated in a new manner under IMG. In addition, it was concluded that, except for the Continuing Education unit, academic or academic support units experienced "no discernible negative financial effect" (p. 8). Hearn et al. (2006) supplemented the internal committee's quantitative review of IMG with structured interviews of three collegiate deans. The researchers reported a consistent theme among the deans about competition for resources and the importance of the wider academic community. In particular, one dean commented that IMG hurt the university's ability to raise collective funds: "That's the favorite argument of the libraries" (p. 13). The authors report that since the implementation of IMG in 1997, the university is trying to move to a "purer" version of IMG. The authors agree that this case study does not clearly capture all the nuances of the implementation and evolution of an incentives based budget. However, given the lack of empirical data on recent adaptations of this type of budget, the data are significant on an increasingly noteworthy practice.

*Responsibility/Cost center budgeting.* One of the most common market interaction strategies is Conant's "tub has its own bottom" approach first used at Harvard University. Responsibility or cost center budgeting was developed from Harvard's administrative policy that "every tub stands on its own bottom" which meant that each unit must generate income equal or greater than what funds are expended. Morgan (1984) characterized responsibility/cost center budgeting as a new structuring incentive to

decision making strategy. Responsibility Center Budgeting (RCB) was first developed at the University of Pennsylvania in the 1970s. The University of Southern California and Indiana University have also adopted the RCB practice (Whelen, 1991). Departments and support units are considered cost centers for fiscal purposes and are expected to be self-supporting. For an academic department, cutbacks would prevail if tuition and fees were insufficient to cover faculty salaries.

The most common advantage of this practice is the direct link created between institutional objectives and resource distribution. The budget method facilitates accountability by dividing the budget into cost centers. By relying on qualitative measurements, the budget appears to meet the needs of all budget participators and is responsive to institutional goals and needs (Lasher & Greene, 2001).

The significant weakness of this practice is the difficulty of apportioning tuition income to an “out-of-area” enrollment (Massy, 1990). For example, it is unclear if resources are allocated equitably when a nursing student takes an art class. One questions the occurrence of dollar transfers from one budget cost center to another to accommodate these inherent bundling issues. In addition, research is vague on the finality of the cost center that has actually depleted its money. With the centers that are budget poor, are they actually cut and stripped of necessary products and services indefinitely or until the next budget year begins? It is more likely that political forces would ensue to allocate any unrestricted, available funds to be transferred to that needy cost center. If income is lost, expenditures should be reduced to keep the budget balanced. However, the budget encourages competition among budget participators and providing an equitable distribution of resources is more difficult. The budget method is time consuming and

requires complex calculations (Lasher & Green, 2001). Responsibility budgeting activities include: (a) using a partially or completely self-supporting budget, (b) dividing the library budget into cost centers to track monetary inflows and outflows, (c) using cost centers to identify and track fiscal accountability in the library and (d) cutting expenditures to keep the budget balanced if library income is lost.

The general idea of cost center budgeting is to transfer ownership of the budget process to the deans, department chairs, and faculty (Whelen, 1991). This decentralization of fiscal planning carries the responsibility for fairness in budgeting. It also provides central leadership with an approach for making reallocation compatible with structural and cultural realities (Massy, 1990). However, academics are slow to embrace a highly competitive environment in which the dispute about equitable funding can disrupt the university landscape. Not surprisingly, relevant empirical studies on academic libraries and responsibility/cost center budgeting are absent from this literature review. Because of the obvious role of the library as a supplier of a public good that is central to the university mission, responsibility budgeting strategies are rarely applied to the library's general operating budget (Warner, 1998).

However, as larger libraries increase their services for hire to governments and corporations, this type of budgeting strategy must be acknowledged in this study. Although there is much discussion in the literature that libraries should take a more aggressive position in selling library and research services to the public to generate income, there is very little research on the extent of the practice in academic libraries (Allen, 1995; Ashford, 1981; Birdsall, 1995; Hisle, 2002; Moran, 2005; Saunders, 2003; West & Stromgren, 2003).

## General Resource Allocation Studies

### *Allen and Birdsall Studies*

There are few well-designed studies on resource allocation problems in academic libraries relevant to this dissertation. Two studies focus on different aspects of the resource allocation problem in libraries and are presented in this section.

Allen (1995) sent questionnaires to 230 academic libraries in the US and Canada, which were selected from ARL and ACRL membership to further research resource allocation and the materials budgets. The questionnaire defined the term materials budget as “that pool of funds used in the library to acquire and provide access to materials and sources of information” (p. 133). After designing and pilot testing the initial questionnaire from a literature review that spanned ten years, the author had noted the lack of an instrument as a factor in the instrument’s creation; Allen sent the document to the top administrators of the selected libraries. Library directors, deans, or university librarians were the main respondents as 177 questionnaires were returned. Fifty-five percent of respondents stated their library’s material budget was less than \$3 million and 45% were in excess of \$3 million.

Allen asked if the traditional materials budget had changed to reflect the costs of purchasing materials in an electronic age where technology costs were beginning to skyrocket. The context of the study was the materials budget but Allen contrasts this budget line against the general library operating budget. “Librarians are struggling to fund support costs in the hundreds of thousands of annual dollars for medium-size libraries and millions of annual dollars for research institutions” (p. 142). The materials



budget is reportedly vulnerable to “raiding” from library administrators and if this budget is a source of borrowing, the manner in which it is managed is relevant to this study.

The author found that most of the administrators still allocated the majority of their budget to purchasing materials and not technological costs. Allen states that it is the computer expenditures that libraries need to be concerned about if university or college administrators assume that these costs can be merged in the traditional, yet static materials budget. For example, if an administrator were using an incremental budgeting strategy, the percentage increases necessary from one year to the next would be extremely overwhelming to a library’s budgeting structure. However, Allen’s findings suggested that library personnel continued to allocate resources in a traditional manner. The author encouraged librarians to look closely at internal processes to help solve funding issues now and in the future. Allen advocated Campbell’s (1994) “radical reallocation of internal resources” by looking closer at internal processes and reengineering when possible so the library could have a larger role in improving their own resource allocation. Allen’s comments are still relevant today as Jarzabkowski (2002) remarks that flexibility is essential to managing significant changes in an environment.

Significant challenges to this study were the need to gather statistical data and opinion in one study, and to keep the questionnaire a reasonable length. Allen noted some respondents’ complaints about specific definitions and the use of imprecise language in the instruments. All of the concerns in the Allen study were significant in the development of the instrument for this study. Allen concludes with the statement that librarians must stop viewing themselves as the only gatekeepers of online information

and should look to other technology centers on campus for cost sharing opportunities. The significance in the Allen study is that in the early to mid-1990s, technology costs of the libraries were just starting to surge and the traditional materials budget with implications to the general operating budget, were just starting to feel the pressure of those expenditures. If administrators were using traditional budgeting strategies to manage funds in the Allen study, were they forced to develop hybrid strategies to manage these escalating costs? This study cannot answer this question but only raise its importance in the discussion of current budgeting activities in the library directors' office today. After an investigation of the budgeting strategies in use at extensive libraries, will undescribed modes of strategies be identified?

Birdsall (1995) conducted a multiple site case study of four Research I land grant institutions in four western states. Twenty university administrators were conveniently selected for one hour interviews to investigate the role of politics in the university budgeting process. Interview questions were designed to obtain responses about the strategies used by key budget decision makers in the university. Birdsall suggested that the importance of his study to library administrators is the importance of politics and power in academic life. In this study, Birdsall contributes to the discussion of Morgan's market based resource allocation strategies and the need for hybrid budgeting strategies (Morgan, 1984).

Fiscal responsibility is more difficult than just following university business procedures. In addition to advanced planning, Birdsall's interviewees highlighted the importance of broad-based involvement by faculty and staff. Birdsall concluded that "success in achieving desired levels of funding for the library may depend on a director's

willingness to accept a number of paradoxes about the budgeting process in universities” (p. 436). Namely, political influence and objective, statistically based data are relevant in budget crafting.

Although budgetary claims must be well stated and objective, Birdsall reported that the library administrator’s personal approach and trustworthiness were significant factors in the resource allocation process. Building fiscal credibility, and delivering a well crafted budget document and presentation are the keys to improving budget making. Of particular interest is Birdsall’s reliance on the view, based on organization theorists, that decisions are the result of control and influence outcomes. He concluded that decision making occurring in an environment characterized by market based characteristics (bargaining, position jockeying, negotiation) is “rather than being outside the system and a threat to the organization, politics, is a dynamic component of the system and a prime determinant of its rationality” (p. 427-428). This is an extremely interesting characterization of the use of politics as a rational process.

Birdsall’s findings are limited to the data from the case studies of four large, public universities. The biggest weakness of the study is that it only represents a detailed examination of a very small portion of the population. Generalizations from the study are tempting but inappropriate on a large scale.

A review of the literature on resource allocation generates a tremendous amount of opinion papers but few reports of actual practice. The Allen study represents quantitative study and the Birdsall study represents a qualitative one. Each author is known in the literature for their work on academic libraries. Although the contexts of their studies vary, the message as cited by Morgan (1984) is the same. Political processes

such as coalition building and rational processes such as statistically based budget documents are equally relevant to the resource allocation process. An examination of internal budgeting activities to observe the role of rationality and market interactions in the budgeting process should place administrators in a better position to allocate their scarce resources through an increased awareness of the process (Allen, 1995; Birdsall, 1995; Morgan, 1984).

### *Resource Allocation in Other Organizations*

#### *O'Toole and Marshall Study*

Very few studies characterize libraries and similar nonprofits and their management's budgetary strategies. O'Toole and Marshall's (1987) nationwide questionnaire of public budget practitioners and their tools and Haas and Giambruno's (1994) review of nonprofit organizations' budgeting strategies are the most recent research articles pertinent to this dissertation. The significant strength of these studies is their existence among a background of position papers. The weakness lies in the fact that the most recent questionnaire is 12 years old and highlights the critical need for current research on budgeting strategies in nonprofit entities.

O'Toole and Marshall (1987) sought to identify the budgeting strategies used by local governments and to characterize the "state of the art". As in previous studies on resource allocation, O'Toole and Marshall reiterate the complaint that there are very little data on budgeting techniques in actual use. To address the gap, the authors seek to describe local government budgeting through the use, extent, and impact of various tools or techniques.

In 1985 and 1986, the authors developed their own questionnaire to determine budgetary strategies of local governments because no other instrument for collecting data on budgetary strategies was available. The questionnaire collected six types of data (a) background information on respondent and respondent's jurisdiction; (b) organization and responsibilities of the office; (c) use of various budgetary preparation tools; (d) nature of jurisdiction's budget and approval process including citizen input; (e) the use of specific budgetary strategies and (f) impact of jurisdiction fiscal climate on use of specific budget tools. O'Toole and Marshall stated that their questionnaire was designed to collect data that was beyond the scope of their published article. Unpublished data stand as a potential weakness of the study. Follow up e-mails with the authors provided no explanation to the published disclaimer of the study (personal communication, July 26, 2006).

Using a nonrandom sample, 750 local government budget practitioners were drawn from the Government Finance Officers Association (GFOA) current membership roster. After initial and follow up mailings, 526 responses yielded a return rate of 70%. Practitioners included budget officers, finance officers, business managers, clerk/treasurers and other top managers in local government. A total of 74% of practitioners were from cities or municipalities, 16% from counties or regional governments, 6% from school districts, and 4% from special districts. Geographically, 14% were from the northeast, 33% from the south, 28% from north central, and 25% from the west US.

The researchers found that staff judgments and trend projections were the most prevalent form of budget forecast or estimate. The choices for budget strategies for the

study included: line-item, performance, program, ZBB or target base, and hybrid budgets, defined by the authors as a combination of any two or more formats. O’Toole and Marshall found that the pure formats and hybrids represented fifteen alternative budget formats. Table 3 shows the top five budgetary strategies in these local governments. The authors note that the remaining ten alternative formats were used by less than 3% of the reporting practitioners.

Table 3  
*Top Five Budgeting Strategies*

Budgeting Strategy	Percentage
Line-Item Budgeting	58%
Line-Item and program hybrid	14%
Program Budgeting	9%
Line-item and performance hybrid	4%
Performance and Program hybrid	3%

*Note:* Source: O’Toole and Marshall, (1987).

O’Toole and Marshall reported that line-item budgeting was higher in the Northeast and lower in the West, and they found that reliance on line-item decreases as the size of jurisdiction increases. The article presents more observations on the reported budget strategies and other variables such as jurisdiction size, strategies used five years earlier, and percent of jurisdictions changing strategies during the next five years.

O’Toole and Marshall believe that, given the lack of information on this subject, their results provide a reasonable picture of budgeting in local government and indicators for the state of the art. In their collection of budgeting strategies, the authors simply asked the government officers to report the name of the strategy in use, without clarification of

any employed budgeting activities. O'Toole and Marshall conclude that the budgeting process does contribute to the public administration of funds. Because the full scope of the questionnaire was not disclosed, the 1987 study by O'Toole and Marshall has limited contributions to the budgeting literature.

#### *Haas and Giambruno Study*

Haas and Giambruno (1994) studied the fiscal and budget strategies of government funded nonprofit organizations located in the western US. The authors cite the important role of these nonprofits in implementing government programs and suggest that they are relevant to the execution of public policy. Without any knowledge of specific budgeting strategies in place, Haas and Giambruno assert the capacity of these agencies to handle millions of dollars in federal funds is unknown. The large scale reliance on nonprofits to administer federal public services has stimulated an increased interest in the management capacities of the grant recipients. In addition to describing the budget tools used by these organization administrators, the Haas and Giambruno questionnaire described the respondents' perceptions of the budgeting methods in use.

The questionnaire was developed through the authors' literature review of the public administration field. The researchers stated, "this approach was adopted since virtually no information specific to the nonprofit sector and appropriate to the research could be located despite extensive research" (p. 319). Haas and Giambruno selected a single national organization and 41 affiliates to complete the questionnaire. The authors cite the exploratory nature of the research and limited resources as reasons for the lack of diversity in the sample in terms of geographical area and nonprofit sectors. The single

national organization is organized like The United Way and similar national organizations with a combined 816 locations in 46 states and the District of Columbia.

The return rate for the questionnaire was 76%. Most of the respondents were fiscal officers with agency budgets ranging from \$.5 million to more than \$1.5 million. Similar to government agencies, nonprofit administrators have many different options for arranging their budget recommendations to their governing boards. The selected budget strategy dictates the creation of the budget document. Haas and Giambruno (1994) identified five budget strategies: line-item, performance, program, zero or target-based, and hybrid. The researchers suggest that hybrid systems are common in local governments because of the changing nature of the budget process. Many local governments experimented with new budgeting techniques while they kept parts of the old budget intact (Pointer & McGowan, 1984).

As described in Table 4, all agencies reported some use of the line item budget while the use of other strategies varied. ZBB was absent in the largest budget size category.

Table 4  
*Current Budget Strategies and Budget Size Breakdown\**

Format	All Respondents	Less than \$0.5 Million	Between \$0.5 - \$1.5 Million	More than \$1.5 Million
Line-Item	31	6	15	10
Performance	12	4	5	3
Program	22	3	9	10
Zero-based	3	1	2	0

\* 68 respondents

Source: Haas and Giambruno, 1994.



All institutions had an underlying base of the line-item strategy along with portions of other common allocation strategies. By trying to contrast their research against existing budgetary studies, the authors compared other aspects of their study with the O’Toole and Marshall study of government budget practitioners. Table 5 compares the Haas and Giambruno (1994) and O’Toole and Marshall (1987) data.

Table 5  
*Nonprofit and GFOA Member Budgeting Strategy Comparison*

Budgeting Practice	Haas and Giambruno Nonprofit Study	O’Toole and Marshall GFOA Member Study
Line-item Only	27%	58%
Line-item and program	33%	14%
Line-item, performance, and program	33%	3%
Line-item and performance	7%	4%
Program only	-	9%
Program and performance	-	3%
Performance	-	2%
Zero-based only	-	2%

*Note: Source: Haas and Giambruno (1994); O’Toole and Marshall (1987)*

Haas and Giambruno (1994) compared their nonprofit organizations with the government jurisdictions and suggested that performance and program budget strategies are easier to implement in organizations with narrow scopes. The researchers believed that their nonprofits provided smaller numbers of services than the local city and county governments. O’Toole and Marshall (1987) found that the use of line-item budgeting was smaller than in larger jurisdictions. Nevertheless, the incremental line item budgeting strategy was a significant budgeting strategy in both studies. Although weaknesses of

these studies are relevant, among a field of position papers, each study tries to contribute empirical data to the complex subject of resource allocation urgently in need of more than just opinions (Allen, 1995; Scott, 2001; Shaughnessy, 1989).

### *Conclusion*

There is considerable literature in the fields of economics, political science, higher education administration, and library management from the most popular to the most feasible budgeting strategies. Birnbaum (2001) has devoted an entire text on management fads in higher education and the reasons for strategic success and failure. According to Schmidlein (1990), difficulties in predicting future needs and environmental problems may be the reason that any one allocation strategy cannot address all the complex issues involved in budgeting. Short-term management fads, unpredictable university environments, and the challenge of a research instrument make exploration in this area challenging.

Current empirical data on resource allocation strategies in extensive academic libraries are crucial to understanding the administrative activities in use in library offices. There are numerous calls and recommendations from the research literature for further studies on resource allocation (Bremer, 1994; Brown & Blake Gonzalez, 2007; Cope, 1987; Garvin, 1980; Hayes, 1993; Jacob, 1990; Keller, 1993; Massy, 1990, 1996, 2003; McClure, 1981; Schmidlein & Milton, 1990; Shulock & Harrison, 1998). However, given the above cited constraints, there are few studies that satisfy those calls.

Following the Allen (1995), Haas and Giambruno (1994), and O'Toole and Marshall (1987) studies explained in this chapter, the data in this study was collected through a four part, precoded questionnaire developed through literature reviews from

Lasher and Greene's budget strategy summaries (2001), Morgan's (1984) resource allocation models, and Sizer Warner's (1998) manual for budget administration for librarians. The questionnaire was also developed with Alreck and Settle (1995) guidelines for questionnaire research, and Dillman's (1978) total design method. In Chapter 3, the complete research plan will be presented.

## CHAPTER 3: METHODOLOGY

A survey research design was used to examine what resources allocation strategies are being used in academic libraries (if any) and to examine how the directors manage their limited resources in a complex environment. A four part, precoded questionnaire, *Resource Allocation Strategies in Extensive Academic Libraries*, was developed for this study and administered to the library directors at 151 public and private Carnegie classified extensive university libraries in the United States.

This chapter presents the methods and procedures, including discussion of the population and instrument, used in the study. This chapter concludes with a summary of research methods and procedures. This study examines the following research questions:

1. What resource allocation strategies are used by the directors of doctoral/research university (extensive) libraries? Which strategies are most and least frequently used? From participant responses, does the use of a hybrid mode emerge?
2. What are the internal and external conditions of the library environment that precipitate the use of such strategies?

### Resource Allocation Framework

To understand on how the status of resource allocation in libraries today can be determined, the principal beginnings of resource allocation must be understood. Smith (1776) first defined the foundation of resource allocation theory with the proposition that individuals seek the most profitable uses of resources so that in equilibrium the rates of return will be equal. In the US, Key (1940) posed the crucial research question: “On what basis shall it be decided to allocate x dollars to Activity A instead of allocating them to

Activity B” (Lewis, 1952, p. 42)? Key (1940) cautioned that the application of Smith’s resource allocation theory would be very difficult, at best, because of significant differences in competitive demands and policy goals (Friedmann & Hudson, 1973; Leslie, 1984; Morgan, 1984). He advised that solutions to the resource allocation dilemma might be found through an improved understanding of the institutional arrangements by which resource allocation decisions are made. This forms the basis for this study on resource allocation strategies in academic libraries. By collecting questionnaire data on budgeting practices and the internal and external conditions of the library environment, Key’s “institutional arrangements” may be discovered.

Research questions incorporating Morgan’s (1984) rational and market interaction models of resource allocation served as the framework for this study. His studies of the two distinct ways in which budgeting decisions may be made, in a rational manner or based on the market, are crucial. Rational resource allocation strategies include formula, program/PPBS and ZBB or target-based budgeting. Market resource allocation strategies (commonly referred to as political decision making) include incremental line item, performance/incentive, and responsibility/cost center budgeting.

In determining which resource allocation strategies are in use (if any) by library directors, Morgan’s models provide direction on the importance of rational transparency in budgeting and also address the important role of the political negotiation of resource management. It is suspected that library directors’ decision making strategies are influenced by rational and political influences and directors are using budget hybrids to address these influences. The six most common budgeting strategies identified in Morgan’s two models ultimately describe how library directors are commonly making

their resource allocation decisions. Research is sparse on resource allocation blends and libraries and this study will fill an information gap about budgeting in the library environment.

Lastly, the selection of appropriate resource allocation terminology is crucial in supporting this framework. A resource allocation strategy describes the differentiating budgeting activities a library director pursues to allocate the resources of the library operating budget. Accordingly, the term activity describes the library directors' habitual or customary actions for allocating monetary resources within the library resource allocation strategy(s). The budget activities in the research questionnaire directly correspond with the six resource allocation strategies outlined in this study. Complete strategy definitions and activity relationships are found in Chapter 2.

This study reports the budgeting activities used by extensive library directors and evaluates the self-reported activities with applicable, corresponding resource allocation strategies. Responses were examined for hybrid strategy use. The crux of this research was to describe which of the six strategies are most and least frequently used in allocating the library operating budget, the external and internal conditions of the library environment and if the use of a hybrid mode emerges.

### Design of the Study

The method of research that focuses on trends and then describes what the researcher sees is descriptive research (Babbie, 2004). To develop an appropriate research plan for this study, Leedy and Ormrod's (2001) four basic structures of descriptive research were explored.

First, a descriptive study must involve a situation that demands observation as the principal means of collecting data. In this study, the directors were asked to report their self-observed behaviors by completing a questionnaire of their use of frequency of specific budgeting activities, their budgeting strategy choice(s), their comments on the library economic environment, and their demographic and professional characteristics. The director's observations in this study were critical to find out which resource allocation strategies are used and to examine how the directors manage their limited resources in doctoral/research university (extensive) libraries. Merriam-Webster (2007) defines observation as an act of recognizing and noting a fact or occurrence which may involve measurement with instruments such as the questionnaire used in this study.

Second, Leedy and Ormrod (2001) contend that the population must be clearly and carefully defined to set precise limits for the population. The population of this study will be limited to the directors of the 151 extensive libraries in the US as classified by the Carnegie Foundation for the Advancement of Teaching (2002). The library director is identified as an important administrator with an essential role in the budgeting process (Budd, 2005; Clayton, 2001; Munn, 1983; Neville, 1980; Schick, 1985). These professionals are highly experienced, knowledgeable and incredibly busy running large, multi-site university libraries with large numbers of staff members. Library directors of this caliber are akin to chief executive officers in the business world (Budd, 2005).

Third, particular attention should be given to safeguard against bias in the research design. The basis for this study's research instrument has been adapted from the Allen (1995), Haas and Giambruno (1994), and O'Toole and Marshall (1987) studies. Using literature reviews and Alreck and Settle's (1995) guidelines for questionnaire

research, the instrument, entitled Resource Allocation Strategies in Extensive Libraries, was designed specifically for this study. Library administrators were asked to report the frequency of their self-observed budgetary activities rather than exclusively identifying themselves with the use of a particular budget strategy. This method was chosen to avoid any preconceived definitions or inaccurate applications of the budget type. To improve the validity of the questionnaire, the instrument was pretested for budgeting lexis comprehension and a pilot study was conducted to verify the validity of the instrument questions. The instrument is found in Appendix B.

Lastly, Leedy and Ormrod (2001) assert that although descriptive research relies upon observation, the data must be organized and presented in a systematic way so that valid conclusions can be drawn. Questionnaires are used to gather data and to describe the characteristics of whole populations (Alreck & Settle, 1995). Following the Allen (1995), Haas and Giambruno (1994), and O'Toole and Marshall (1987) studies, the data collected through the study questionnaire were analyzed quantitatively with percentage and frequency distribution calculations to identify and understand the resource allocation strategies in use in order to answer the first research question. Babbie (2004) defines quantitative analysis as the numerical representation for the purpose of describing and explaining the phenomena that those observations reflect.

Closed and open ended questions asking the library directors about internal and external factors of the library environment provided quantitative data and descriptive narratives which were analyzed using an adaptation of Auerbach and Silverstein's (2003) exploratory content analysis to answer the second research question. After researching



other types of research methods, a descriptive research design was found to be the most appropriate to answer the proposed research questions in this study.

### *Population*

According to Basha and Harter (1980), a population is any set of persons or objects that possesses at least one common characteristic. The population of this study were the directors of the 151 extensive libraries in the US as classified by The 2000 Carnegie Classifications of Institutions of Higher Education (2002) and available for file download in MS Excel. The 2005 Carnegie classification was published in late 2006 but due to pending revisions in the report, the 2000 classification, which underwent final revision in 2004, was selected as the best choice to identify the libraries to be included in this study. See Appendix C for a complete list of institutions.

The academic libraries included in this study are the largest in the US and hold 55% of the country's 913.5 million academic paper volumes (NCES, 2000). The library director has been identified as an important administrator with an essential role in the budgeting process (Budd, 2004; Munn, 1983; Neville, 1980, Schick, 1985). The directors of large academic libraries are assumed to be financial leaders and have the most knowledge about resource allocation strategies and the management of the library (Munn, 1983; Neville, 1980). There is little suspicion that the director will be unable to describe his or her behavior due to lack of knowledge or a willingness to share the information (Alreck & Settle, 1995).

Although nonresponse bias is a concern in any survey research, the chief concern in this study was that the highly experienced library professionals selected to participate in this study were too busy to return the questionnaire. If there was a lower than expected

rate of return of the questionnaires, the researcher proposed that to determine whether there was a significant relationship between those who did and did not respond to this study, chi square tests of independence, using Statistical Package for Social Sciences (SPSS), Version 11.0, would be conducted. Using the only variables available, tests for the gender of the participants as well as whether their university type, public or private, would be used to confirm if the library directors that finished the questionnaire likely reflected the total population of the 151 directors contacted to participate in this study.

#### *Development of the Questionnaire*

In the Allen (1986), Haas and Giambruno (1994), and O'Toole and Marshall (1987) budget studies, the authors' developed their questionnaires through literature reviews from the fields of economics, political science, public administration, higher education administration, and library management. As noted, a previously well-designed instrument for collecting data on budgetary strategies had only been available if the researchers designed it themselves. From determining question content and scope to choosing the data collection format, Alreck and Settle's (1995) research handbook and Dillman's (1999) tailored design method were used in this study to minimize threats (loaded questions, bias introduced in the data processing phase) to the validity of the questionnaire whenever possible.

For this study, a four part, precoded questionnaire was developed through literature reviews from Lasher and Greene's budget strategy summaries (2001), Morgan's (1984) resource allocation models, and Sizer Warner's (1998) manual for budget administration for librarians. The budget activities in the questionnaire emerged directly

from the six resource allocation strategies previously outlined. Complete strategy definitions and activity relationships are described in Chapter 2.

The first section of the questionnaire elicited basic university information on the student population, size and type of the university, size of the university and library's faculty and staff, and the number of library volumes. The second and largest section of the questionnaire, composed of 51 questions, 4-55, prompted the library directors to self-report the frequency of their use of specific budgetary activities in the preparation and management of the library's operating budget. Alreck and Settle (1995) recommend 5 to 7 scale points because fewer choices force the subject to either agree or disagree to some extent and these scales then formed the composite scores to represent each strategy. Questions in this section were arranged by using a 1-7 scale with 1 indicating "never" and 7 "always". Respondents were instructed to select the numeral that best represented the degree of frequency attributed to each activity. The section was completed by circling the corresponding number on the scale.

In the next questionnaire section, library directors were asked to specifically identify by name the budget strategy(s) employed in the management of the library's general operating budget in question 56. The six resource allocation strategies outlined in this study and one additional category, Other/Hybrid/None Listed with open space for participant comments, were listed for selection. Questions 57-62 were inserted next to solicit open ended descriptive narratives to better understand the library director's budget strategy(s) selection. Contextual questions included asking for descriptions of the internal and external university and library conditions, important changing library conditions, the reason why the library director used the strategy(s), and any short-term and long-term

plans to change the current budgeting strategy(s). In the last two questions in this section, questions 63 and 64, respondents were asked to identify the individual responsible for the general operating budget and the respondent's official job title. These two questions serve as a verification of participant expertise and responsibility in the management of the operating budget.

The final section of the questionnaire included demographic information. Respondents were asked to categorize their level of formal financial management training or preparation, gender, age, and years of administrative experience. These were selected for inclusion so that the researcher could create a richer demographic profile of library directors. The total amount of time for the completion of the questionnaire was approximately 20 minutes.

By identifying resource allocation strategies that describe the current budgeting activities, library directors provide the basis for an improved understanding of the budgeting process of resources and the internal and external economic pressures of the library. Because the meaning of this study rests on how objectively the observation of these budgeting activity frequencies can be reported, developing a reliable and valid instrument was essential.

Instrument validity is defined as the extent to which an instrument measures what it is supposed to measure (Alreck & Settle, 1995). Face and content validity were considered important in the development of the study instrument and multiple attempts were made to establish questionnaire validity. The use of a pretest, pilot study, and expert opinion were crucial to this process. After the questionnaire was initially developed, it was analyzed using a pretest and pilot study to develop and improve the questionnaire

validity. In summer 2007, the content of the instrument was pretested by 44 business undergraduate students. The students were asked to identify and match 58 budgeting activities with the six budgetary strategies outlined in this study. From the pretest, 12 activities were eliminated, 4 activities were added and 6 activities were revised. Expert opinion was additionally sought from 3 library budget administrators to provide content validity by reviewing the instrument questions, style, structure, and their appropriateness for this study. Internal consistency reliability reflects the extent to which items of a test measure various aspects of the same characteristic and nothing else (Hinkle, Wiersma, & Jurs, 2003). Reliability and the use of Cronbach's alpha test to measure internal consistency in the pilot study will be discussed later in this chapter.

*Pilot study.* A pilot study was conducted in the spring of 2008 to improve validity of the *Resource Allocation Strategies in Extensive Academic Libraries* questionnaire and also to test the reliability of the instrument questions. The sample of the pilot study was constituted of library directors at randomly selected *intensive* universities in the US as classified by the 2000 Carnegie Classifications of Institutions of Higher Education (2004). Thirty library directors from 14 public and 16 private universities, participated in the pilot study. In preparation for the pilot study and assembling the distribution list, it was noted that question 63 (which asked the respondent the job title of the individual responsible for the operating budget) needed to be expanded to include three additional job titles synonymous with the title of library director. After one follow up, the response rate of 81% yielded the questionnaires sufficient to evaluate the instrument's strengths and weaknesses including a calculation of the instrument with Cronbach's Coefficient Alpha. Cronbach's Alpha measures the internal consistency of the scales.

Study participants completed all the questions in the first section of the questionnaire and those responses were evaluated to be appropriate and suitable for the questionnaire by the researcher and an expert in the field. The second and largest section of the questionnaire to be completed by the library directors asked them to self-report their frequency of specific budgetary activities in the management of the library operating budget. Using SPSS, Version 11.0, questions 4-55 were tested using Cronbach's Coefficient Alpha. Cronbach's Alpha was selected as the most appropriate measure for the scales used in this study. Schumacher and McMillan (2000) recommend Cronbach's Coefficient Alpha because it is used for items "that are not scored right or wrong" and is "generally the most appropriate type of reliability for survey research in where there is a range of possible answers for each item" (p. 300). With a Cronbach's Alpha of .70 or greater it would indicate that a sufficient internal consistency exists as an indicator of the instrument's reliability (Nunally, 1976). Therefore, each pilot study budgeting activity was assessed with the results being presented in the following sections.

*Cronbach's coefficient alphas of the pilot study.* Based on the results of the Cronbach's alpha tests it was found that each one of the constructed variables on the *Resource Allocation Strategies in Extensive Academic Libraries* questionnaire were reliable. The results of all seven tests are presented together in Table 6.

Table 6  
*Analyses for budgeting strategies of the Resource Allocation Strategies in Extensive Academic Libraries questionnaire pilot study*

Variable	Cronbach's Alpha	N of Items
Formula Budgeting	.811	6
Program Budgeting/PPBS	.947	6
Zero Based Budgeting	.899	8
Incremental Line Item Budgeting	.928	9
Performance/Incentive Budgeting	.929	9
Responsibility/Cost Center Budgeting	.810	6
Comments on the Budgeting Environment	.711	7

*Note: N=30*

In the next questionnaire section, library directors were asked to specifically identify by name the budget strategy(s) employed in the management of the library's general operating budget and to explain any internal and external complications in the budget environment that might contribute to their use of a specific strategy(s). Open ended questions in this section allowed library directors to describe their economic environment, conditions and complications. Of the 30 questionnaires received, 22 library directors provided detailed narratives explaining different pressures from external and internal forces and reported high usage of creativity and flexibility in the development of the library budget. The responses to this section of the questionnaire were evaluated to be appropriate and suitable for the questionnaire.

The final section of the questionnaire to be evaluated by the pilot study prompted the library director to self-report demographic information. To improve the questionnaire, the phrase, please complete all the questions you care to answer, was included in this

section where respondents were asked personal information such as age, gender, and years of administrative experience.

At the conclusion of the pilot study, the *Resource Allocation Strategies in Extensive Academic Libraries* questionnaire was revised to develop and improve the instrument for distribution to the academic library directors of the 151 extensive libraries in the US as classified by the Carnegie Foundation for the Advancement of Teaching (2002). The final questionnaire included 68 questions providing ordinal and interval data with descriptive comments from library directors. Prior to completion, the questionnaire met all requirements as mandated by The George Washington University Institutional Review Board (IRB) and the study was granted exempt status from an IRB review and was issued IRB #030818.

#### *Data Collection Procedures*

Specific data collection procedures for each phase of the study are described next. A mailing and response log, developed with the Alreck and Settle (1995) guide, was kept in MS Excel to track the flow of study questionnaires. The names and contact information, including e-mail and address, of the directors were obtained from each educational institution's website and from a 2008 member database for purchase from the Association of Research Libraries (ARL). On July 6, 2008, institutional approval of the study was given and the first participant contact consisted of an e-mail, using a blind distribution list, sent to the entire study group to announce the study, to notify the directors that they had been selected for the study, to encourage participation, and to specify the future delivery of the questionnaire.



Several explicit steps were taken to preserve the anonymity of subjects in the collection and reporting of data. A randomly assigned, computer generated three-digit unique identifying number was assigned to each participant. Only one participant log linking respondent names with the unique identifiers was produced. The researcher had sole access to the participation log and it was secured separately from the study questionnaires and password protected. The three-digit number was affixed to the lower left corner of the instrument and this method permitted the researcher to track the receipt of questionnaires and the status of replacement instruments. This method was employed to track nonrespondents and avoid unnecessary follow-up correspondence (Salant & Dillman, 1994). If a participant returned the questionnaire with a name and signature attached, via postal mail, fax or e-mail, the information was redacted as appropriate. The questionnaire was designed such that no individual's responses could be identified as their own (Dillman, 1999). Participation in the study was voluntary and minimal risk was posed to participants. A separate informed consent form was not required to be included in the questionnaire packets (M. Hamel, personal communication, March 17, 2008). If in the future, the results of this research study are reported in journals or at scientific meetings, the directors who participated will not be named or identified. The researcher will not release any information about an individual's research involvement without written permission, unless required by law.

Within five days of the e-mail introducing the research study, all packets were mailed to the 151 directors. The mailing labels of the questionnaire packets were personalized such that they identified the full name and mailing address of each library director. No labels had to be discarded as a result of incomplete addresses. A cover letter,

information sheet, and numbered questionnaire designed specifically for use in this study were distributed in a 10 x 13 envelope via first class postal mail. A self-addressed, stamped 9 x 12 envelope was provided for each respondent to return the questionnaire to the researcher's home address. Postage per mailing was \$1.34 and \$1.17 respectively. Following Dillman's (1999) tailored design method, after an initial mailing, a follow-up customized, color post card was sent to each director to thank those who participated in the study and to remind those who did not respond to return the questionnaire within ten business days. An additional mailing of questionnaire packets was sent on August 1, 2008 to nonrespondents. Participants were encouraged to contact the researcher, via telephone or e-mail, if they did not receive a questionnaire packet or had a question regarding the study. An electronic copy of the questionnaire was also created using the form feature in MS Word and e-mailed to participants as needed to solicit participation in the project. Participants were also encouraged, when necessary, to scan and e-mail the completed questionnaire to the researcher's e-mail address at The George Washington University.

Using the participant log each returned questionnaire was counted to develop a response rate computation. Nondeliverables were monitored in the log to establish any necessary re mailing and redropping with follow up cards and duplicate mailings. Each questionnaire received was logged by date received and by its three digit numerical code. One last mailing was sent on September 1, 2008, with a deadline date of September 30, 2008. All completed questionnaires were sight edited for completeness. Sight edit checks included validation of the individual completing the instrument. Questionnaires deemed

complete and acceptable were analyzed and the data entered into MS Excel. A complete description of the procedures for analyzing data is in the next chapter section.

### *Data Analysis Procedures*

Methods used for analyzing data are described in this section. The method of data collection in this research was the self-administered paper questionnaire. All completed questionnaires were sight edited for completeness. All questionnaires were reviewed to determine whether there were any missing data. Omitted or ambiguous items were examined. If those items could not be determined, they were counted as a nonresponse for that item, permitting the remaining data to be included in the study results. Questionnaires deemed complete and acceptable were analyzed and the collected data were transferred entered into a precoded MS Excel workbook. The MS Excel workbook contained individual spreadsheets where preexisting mathematical functions were applied to determine percentage and frequency distribution calculations. Spreadsheets are the most common document for data entry (Alreck & Settle, 1995).

The design of a spreadsheet with its ability to log thousands of records and mathematically control individual cells, the intersection of a column and a row, makes MS Excel ideal for this study. MS Excel was chosen to initially analyze the data in this study for a variety of reasons. Questionnaire data were stored in MS Excel in the form of raw data, processed data, and visual representations of the processed data. Descriptive data analysis summarizes large amounts of data and MS Excel performs this function quite adequately (Babbie, 2004).

After data entry, a verification of accurate data entry was performed to validate all entries and minimize the suspicion of omitted data especially with the open ended

questions. Alreck and Settle (1995) outline three kinds of data editing errors that were relevant for this study: (a) missing records, (b) records that deviate from their prescribed format and (c) variables that exceed an acceptable range in a record. As the authors suggest, certain data editing techniques minimize the occurrence of these errors and those techniques were used in this study.

First, the hard copies of the questionnaires and multiple electronic backup copies of raw data were created and stored in a separate secure location. Second, backup electronic copies of processed data were necessary to prevent missing data. To eliminate the possibilities of deviated records or unacceptable variable formats, the cells in the MS Excel spreadsheets were formatted for specific data types that prevent an individual from placing the wrong data into a cell. For example, the spread of frequency for budgeting activities was 1 “never” to 7 “always”. The spreadsheet cells were formatted specifically and if anything other than these numbers were entered; the spreadsheet would not accept the entry and provide the researcher with an error message.

Protocol checks were crucial in this study to provide accurate data and developing resultant conclusions. To strengthen the study’s data analysis procedures, data were later imported into SPSS which was used for additional data analysis to include calculating Cronbach’s Coefficient Alpha for the frequency scales found on the second section of the questionnaire. The data import allowed the researcher the opportunity to use the full range of SPSS analysis, including Cronbach’s Coefficient Alpha and chi square tests of independence if so needed.

The questions in the instrument yielded quantitative data and narratives related to the two research questions. By using frequency and percentage distribution methods, this

study identified the resource allocation strategies of library directors and the frequency by which these strategies were used. Open ended structured questions provided narratives of any internal and external pressures that the library director is experiencing and the pressures' impact on the budgeting process of the library. The method of analysis used for the open ended responses was an adaptation of Auerbach and Silverstein's (2003) exploratory content analysis.

Research using a descriptive design is helpful for describing an existing phenomenon by using figures to characterize individuals or a group (Schumacher & McMillan, 1993). One of the most common ways to describe a variable is with a frequency distribution (Babbie, 2004). In this study, frequency tables were the way of summarizing the ordinal and interval data. A frequency table is a record of how often each value or set of values, of the variable in question occurs and it may be enhanced by the addition of percentages that fall into each category (Babbie, 2004). Responses from the first, second and fourth sections of the instrument of this study provided ordinal and interval data. Item means and standard deviations for responses were calculated. The data were examined for distinct patterns. The third section provided descriptive narratives and comments from the library directors about the library environment.

The type of budgeting strategy(s) used by directors was analyzed in two distinct ways. First, a budget activity sorting matrix was developed to identify the directors' budgeting activity selections for patterns of use. By questioning the directors on their use of specific budgeting activities, a better understanding of their daily practices may be developed without an assumed definition of a specific strategy. The sorting matrix was developed in response to a concern that the library directors in this study may not have a

consistent and unified definition of one or all of the six budgeting strategies in question. The standard error of measurement (SEM), a measure of the spread of the directors' frequency scores, was calculated (Schumacher & McMillan, 2000). The SEM was used to develop a basis for comparison to determine which budgeting strategy(s) the director was using based upon his or her activity selections.

The SEM was calculated twice above the composite mean for each of the six budgeting strategy subsets. When the directors' budget mean was higher than the 2 SEMs above the mean, the director was identified as using that particular budgeting strategy. If the director's mean was less than 2 SEMs above the mean, the director was identified as not using that particular budgeting strategy. If a director's composite score was greater than 2 SEMs above the mean on more than one composite, the director was categorized as using more than one budgeting strategy. Frequency and percentage distribution for the sorting matrix results were calculated. The tables were examined for notable patterns.

Second, library directors were also asked to specifically identify by name the budget strategy(s) employed in the management of the library's general operating budget in question 56 of the instrument. Frequency and percentage distribution for the self selection items results were calculated. The data were examined for any frequently used budgeting strategy(s) as directly selected by the participants. A corollary component of this study is to determine if the frequent budget activities of the director coordinates with the resource allocation strategy selected as currently in use. The frequency and percentage distributions for the sorting matrix and directors' self selection results were compared for patterns.

The use of hybrid or multiple budgeting strategy(s) was of particular interest in the data analysis. To test the hypothesis that these library directors are only using one budgeting strategy, a chi square goodness of fit test was chosen to see if these library directors' frequency distribution fit a specific pattern. The chi square test is one of the most essential and used members of the nonparametric family of statistical tests. It is employed to test the difference between an actual sample and another hypothetical or previously established distribution (Hinkle, Wiersma, & Jurs, 2003).

Using SPSS, to test the hypothesis that library directors only use one budgeting strategy, two chi square goodness of fit tests, using SPSS were conducted. Each participant was assigned to a budgeting strategy based on the matrix and due to the insufficient sample size needed to test the 7 groups; the single categories were collapsed into one category of one budgeting strategy. A chi square goodness of fit test was conducted assuming the null of 75% of directors use only one budgeting strategy versus 25% of directors using more than one strategy. The assumption of the 75/25% split was based upon a general postulation that library directors are only using one budgeting strategy (Goldstein, 2005; Linn, 2007). The second test assumed a more conservative 60/40% split of directors' usage.

Open ended structured questions provided narratives of any internal and external pressures that the library director is experiencing and the pressures' impact on the budgeting process of the library. The open ended questions and narratives from the directors on their economic environment, questions 57-62, were analyzed using an adaptation of Auerbach and Silverstein's (2003) exploratory content analysis. In exploratory content analysis: (a) segments of text used repeatedly by participants to

express the same idea are identified, (b) segments are then grouped into repeating ideas, (c) the repeating ideas are then assembled into themes, and (d) once common themes are identified, the analysis is completed by returning to the literature to review theoretical constructs related to the research question. In MS Excel, director comments and narratives were examined for repeated text using the search and highlighting tools; common themes were copied into a separate spreadsheet and marked for literature review and analysis.

Lastly, frequencies and percentages of the demographic data from the last section of the questionnaire were compiled for descriptive purposes and to help establish a profile of library directors.

A descriptive research plan has been presented in this chapter to examine the following research questions:

1. What resource allocation strategies are used by the directors of doctoral/research university (extensive) libraries? Which strategies are most and least frequently used? From participant responses, does the use of a hybrid mode emerge?
2. What are the internal and external conditions of the library environment that precipitate the use of such strategies?

Given the research plan presented in this chapter, the proposed research questions and the descriptive research plan using quantitative analysis of percentage and frequency distribution calculations of resource activity and strategy use and descriptive narratives of library conditions were appropriately matched. A four part, precoded questionnaire elicited data on library directors and their frequency of budgeting activities, their



budgeting strategy choice(s), their comments on the library economic environment, and their demographic and professional characteristics. The data from the returned questionnaires were analyzed to answer the research questions of this study. An analysis of the questionnaire data will be presented in Chapter 4 and final observations and conclusions will be presented in Chapter 5.

## CHAPTER 4: RESULTS

The findings presented in this chapter are reported from data collected from the questionnaire described in the previous chapter. The three-tiered purpose of this study was to examine what resource allocation strategies are being used in academic libraries (if any), if a hybrid mode emerges, and to identify the internal and external conditions of the library environment. This chapter will show descriptive data presented primarily in table form.

Three sections present the data findings in this chapter. Chapter 4 first introduces the demographics of the participants and an overview of the libraries and universities that the participants represented. The second section is a descriptive analysis of the first research question and includes presenting an analysis of Cronbach's alpha statistic, mean, median, and standard deviation for the instrument questions, the frequencies of budgeting activities and if a hybrid mode emerged from the data. The third section is a descriptive analysis of the second research question and reports the results of the questionnaire which included the six structured, closed and open-ended questions regarding the internal and external conditions of the library environment.

### Response Rate and Participant Demographics

The population of this study was limited to the directors of the 151 university extensive libraries in the US as classified by the Carnegie Foundation for the Advancement of Teaching (2002). Based on the profile of these directors in the library management literature, these professionals are highly experienced, knowledgeable and incredibly busy running large, multi-site university libraries with large numbers of staff members (Budd, 2004; Munn, 1983; Neville, 1980, Schick, 1985).

Of the 151 library directors contacted, 92 responded to the questionnaire, 62 completed the instrument, and 30 individuals officially declined to participate citing reasons from that the directorship was vacant to the director having no time to complete the questionnaire. The response rate was calculated at 51%. The 30 individuals who did not complete the questionnaire are presented as follows: 5 of the individuals were out of town/out of country/sabbatical; 6 of the questionnaires stated that the Director "has chosen not to participate in this study"; 11 of the individuals said that they had no time/too busy; and 8 of the individuals said that the Directorship was vacant or director was brand new and did not feel qualified to complete the survey. As for the 59 individuals who did not respond to the questionnaire, despite multiple attempts to solicit their input, it will have to be assumed that they did not have enough time or did not want to respond to the questionnaire. Fraenkel and Wallen (1993) stated that nonresponse may be due to reasons such as "lack of interest in the topic being surveyed, forgetfulness, and unwillingness to be surveyed" (p. 356) and it would appear to apply to this research.

To determine whether the sample could be considered representative of the population chi square tests of independence, using SPSS, were conducted to determine if there was a significant difference between those who did and did not respond to this study. Tests were conducted for the only two variables for which population data were available: gender of the participants as well as whether their university was public or private. The proportion of each gender of the library directors and the public or private status of their universities were based upon population reports. There was not a significant relationship between the gender of the participant and whether the participant responded,  $\chi^2 (1) = 2.90, p = .23$ . The gender of the respondents was proportional to the

population. There was not a significant relationship between whether the school was private or public and whether the participant responded,  $\chi^2 (1) = 0.44, p = .51$ . The university type of the respondents was proportional to the population. In summary, to strengthen the interpretation of the data from the study, chi-square tests of independence were conducted, all test assumptions were met and the results were not significant. The library directors that finished the questionnaire likely reflected the total population of the 151 directors that were contacted to participate in this study, at least for these two dimensions. The demographic analysis described in the next section confirms that the profiles of the individuals who did participate in this study are highly experienced professionals running large, sophisticated libraries.

Study participants will be described in this section with regard to gender, age, and years of experience. The demographic portion of the questionnaire, questions 63-68, was optional and participants were instructed to “please complete all the questions *you care to answer*”. In total, 43 individuals who responded provided information regarding their gender. The majority of those participants who provided a response for their gender were female ( $n = 28, 65.10\%$ ). The remaining were male ( $n = 15, 34.90\%$ ). In total, 42 individuals responded, of those participants who provided a response for their age, just over half were between the ages of 55 and 64 ( $n = 24, 57.10\%$ ).

In total, 42 individuals responded, for the number of years work experience in an administrative position, the most frequent number of years of experience for those who provided a response was 25-29 years ( $n = 11, 26.10\%$ ), which was followed by 11-19 years of experience and ( $n = 10, 23.80\%$ ) and over 30 years of experience ( $n = 10, 23.80\%$ ). The results for these demographic characteristics are presented in Table 7. In

total, 61 individuals responded, for those who are responsible for the management of the library's general operating budget, the most frequent job title response was Director of Library (n = 19, 30.60%), which was followed by Academic Dean, Dean of Libraries (n = 17, 27.40%). In total, 61 individuals responded, for the level of formal financial management training and/or preparation, the most frequent response was for on-the-job training (n = 36, 58.10%). Several participants selected multiple responses. A total of 16 participants selected two of the training methods (25.80%), while a total of 7 participants selected three of the training methods (11.30%) and 1 participant selected four of the training methods (1.60%).

Table 7  
*Descriptive Statistics for Demographic Characteristics\**

Variable	Frequency (N = 61)	Percent
<i>Title<sup>a</sup></i>		
Directory of Library	19	30.60
Assistant Director of Library	5	8.10
Academic Dean, Dean of Libraries	17	27.40
University Librarian	1	1.60
President/Vice President	2	3.20
Provost	1	1.60
Other /More than one job title	1	1.60
No Response	15	24.20
<i>Preparation<sup>*</sup></i>		
On-the-job training	36	58.10
Conference participation	13	21.00
Extensive formal workshop	8	12.90
Undergraduate degree	2	3.20
Graduate degree	15	24.20
<i>Gender<sup>b</sup></i>		
Male	15	34.90
Female	28	65.10
<i>Age in Years<sup>c</sup></i>		
Under 25	0	0.00
26-34	0	0.00
35-44	0	0.00

Variable	Frequency (N = 61)	Percent
45-54	10	23.80
55-64	24	57.10
Over 65	8	19.00
<i>Years of Experience<sup>c</sup></i>		
Under 5	1	2.40
6-10	3	7.10
11-19	10	23.80
20-24	7	16.70
25-29	11	26.20
Over 30	10	23.80

*Note: \* indicates that this option allowed individuals to select more than one option, a indicates that frequencies are based on 61 respondents; b indicates that frequencies are based on 43 respondents, and c indicates that frequencies are based on 42 respondents.*

The frequency distributions for the demographic characteristics of each participant's school were next calculated from questions 1-3 of the questionnaire. The most frequent number of FTE undergraduate students was over 15,000 (40.30%) which was followed by 5,001 to 9,999 students (25.80%). As for the number of FTE graduate students enrolled, the most frequent response was less than 2,500 (33.90%). The majority of the schools had over 1,000 full time staff members (61.30%). There were missing values for 2 (3.20%) of the respondents for this particular question. The most frequent response for the number of full time faculty members was over 1,000 (33.90%), which was followed by 500 to 999 (32.30%) full time faculty members. In terms of the type of university, the majority were public (67.70%) with the remaining 32.30% coming from private schools. The most frequent response for the number of full time library staff was 51 to 100 (32.30%). The most frequent response for the number of part time library staff was 0 to 50 (59.70%). Finally, for the number of volumes the library had, the most frequent response was 1,000,001 to 3,000,000 volumes (40.30%). The characteristics are provided in Table 8 for reference.

Table 8

*Descriptive Statistics for Library and University Demographics*

Variable	Frequency (N = 62)	Percent
<i>FTE Undergraduate</i>		
Less than 2500	4	6.50
2501-5000	6	9.70
5001-9999	16	25.80
Over 10,000	11	17.70
Over 15,000	25	40.30
<i>FTE Graduate</i>		
Less than 2500	21	33.90
2501-5000	17	27.40
5001-9999	14	22.60
Over 10,000	8	12.90
Over 15,000	2	3.20
<i>Full Time Staff</i>		
101-249	3	4.80
250-499	7	11.30
500-999	12	19.40
Over 1000	38	61.30
<i>Full Time Faculty</i>		
51-100	1	1.60
101-249	5	8.10
250-499	13	21.00
500-999	20	32.30
Over 1000	21	33.90
<i>Type of University</i>		
Private	20	32.30
Public	42	67.70
<i>Full Time Library Staff</i>		
0-50	16	25.80
51-100	20	32.30
101-249	17	27.40
250-499	8	12.90
500-999	1	1.60
<i>Part Time Library Staff</i>		
0-50	37	59.70
51-100	9	14.50
101-249	10	16.10
500-999	5	8.10
<i>Number of Library Volumes</i>		
Less than 1,000,000	12	19.40
1,000,001-3,000,000	25	40.30
3,000,001-5,000,000	11	17.70
5,000,001-7,000,000	6	9.70

Variable	Frequency (N = 62)	Percent
7,000,001-9,999,999	5	8.10
Over 10,000,000	3	4.80

### Descriptive Analysis of Research Question One

To address the objectives of this study a descriptive analysis was used. This included presenting a reliability analysis for questions 4-49 of the questionnaire that address the first section of the first research question:

1. What resource allocation strategies are used by the directors of doctoral/research university (extensive) libraries? Which strategies are most and least frequently used? From participant responses, does the use of a hybrid mode emerge?

An analysis of any indication of a hybrid mode will be presented later in this section. For each budgeting activity on the *Resource Allocation Strategies in Extensive Academic Libraries* questionnaire, Cronbach's alpha statistics were calculated to measure the reliability of the instrument. This review is essential before analyzing the collected questionnaire data. A Cronbach's alphas of .70 or greater indicates that an internal consistency is a sufficient indicator of the instrument's reliability. In this study, each strategy's Cronbach's alpha score was above .70 indicating that these items were internally consistent. A summary of the reliability analysis is presented in Table 9.



Table 9  
*Reliability analyses for the variables on the Resource Allocation Strategies in Extensive Academic Libraries questionnaire*

Variable	Cronbach's Alpha Pilot*	Cronbach's Alpha**	N of Items
Formula Budgeting	.81	.74	6
Program Budgeting/PPBS	.95	.91	6
Zero Based Budgeting	.90	.86	8
Incremental Line Item	.93	.88	9
Performance/Incentive	.93	.89	9
Responsibility/Cost Center	.81	.80	6

\* *The Cronbach's Alpha for the pilot study was calculated on 30 participants for all strategies.*

\*\**Formula budgeting was calculated on 61 participants; program budgeting/PPBS was calculated on 61 participants; zero based budgeting was calculated on 60 participants; incremental line item budgeting was calculated on 58 participants; performance/incentive budgeting was calculated on 61 participants; responsibility/cost center budgeting was calculated on 61 participants; general budgeting was calculated on 59 participants.*

The median, mean, and standard deviation values for questions 4-49 from the *Resource Allocation Strategies in Extensive Academic Libraries* questionnaire are presented in Table 10. In total, the analysis was conducted using 61 participant responses. One individual had missing values present. The first set of results that is presented is for questions 4 and 5. Question 4 asked administrators to rate how frequently they received a minimum of 6% of the general expenditures portion of the university budget for library use. Question 5 queried administrators on their role in the management of their library's operating budget. The spread for question number 4 was 1, never, to 7, always, with a mean of 3.61 ( $SD = 2.68$ ) with a median of 3. As for question number 5, the spread was from 2 to 7 with a mean of 6.00 ( $SD = 1.39$ ) and median of 7.

Table 10

*Descriptive Statistics for Establishment of Budget Funding and Budget Participation*

	Min	Max	<i>M</i>	Median	<i>SD</i>
I budget funds that include a minimum of 6% of the general expenditures portion of the university budget for use in the library's operation	1	7	3.61	3	2.68
I manage the current budget method to determine the library's general operating budget	2	7	6	7	1.39

*Note: Response Scale: 1 (Never) - 7 (Always)*

The next set is for the formula budgeting items and is presented in Table 11. The mean value was 3.27 (*SD* = 1.40), median of 3.17, for the constructed formula budgeting variable.

Table 11

*Descriptive Statistics for Formula Budgeting, (N = 61)*

	<i>M</i>	Median	<i>SD</i>
I utilize a budgeting framework driven by student enrollments and cost estimation	2.75	2.00	2.13
I use complex mathematical calculations using FTE or full-time student equivalents to calculate the budget	2.05	1.00	1.76
I rely heavily on quantitative variables to estimate costs and required funding in my budget formulation	3.33	3.00	2.09
By relying on quantitative measurements, I perform technical budget calculations that appear rational	3.49	3.00	2.03
Through the operating budgeting, I perform mathematical calculations to provide an equitable distribution of library resources.	3.48	4.00	2.10
Formula Budgeting	3.27	3.17	1.40

*Note: The response scale is 1 (Never) - 7 (Always). All Min=1 and all Max=7.*

The results for Program budgeting/PPBS items are presented in Table 6. The mean value was 4.40 ( $SD = 1.71$ ), median of 4.83, for the constructed program budgeting/PPBS variable.

Table 12  
*Descriptive Statistics for Program budgeting/PPBS, (N = 61)*

	<i>M</i>	<i>Median</i>	<i>SD</i>
I utilize a budgeting framework driven by library activities and outputs	4.08	5.00	2.15
My budget represents an understanding of library programs and how they work	4.80	6.00	2.37
My budget represents an understanding of university programs and how they work	4.93	6.00	2.19
I clearly provide a means to the library's end goals by using the current budgeting method to manage outputs	4.46	5.00	1.98
During the budgeting process, I consider alternative activities with associated costs in order to better meet program goals	5.03	6.00	2.07
I plan, budget and perform a cost-benefit analysis to develop the library's budget	3.10	3.00	1.65
<b>Program Budgeting/PPBS</b>	<b>4.40</b>	<b>4.83</b>	<b>1.71</b>

*Note:* The response scale is 1 (Never) - 7 (Always). All Min=1 and all Max=7.

The next set of results is for the zero-based budgeting items. The mean value was 3.50 ( $SD = 1.49$ ), median of 3.88, for the constructed zero-based budgeting variable.

These results are presented in Table 13.

Table 13  
*Descriptive Statistics for Zero-based budgeting (N = 61)*

	<i>M</i>	<i>Median</i>	<i>SD</i>
I utilize a budgeting framework driven by the need to justify resources for priority ranked activities	3.69	4.00	2.24
Every year, I evaluate goals and objectives by starting over and assuming no budget minimums to develop the operations budget	2.10	2.00	1.47
Prior to being included in the budget, every year, I categorize potential budget activities and priority rank them	3.44	3.00	2.09
I always consider the costs and benefits for every budget activity in my budgeting process	3.97	4.00	2.05
I do not take budget history into account for the development of the budget	2.12	2.00	1.50
Every year, I justify the need for resources as a formal, written part of the library's budgeting process	4.31	5.00	2.58
I consider the costs and benefits for every budget activity as a part of the library's budgeting process	3.92	4.00	2.15
I use statements of goals and objectives to explain why and how money is being spent in the library	4.51	5.00	2.31
<b>Zero-Based Budgeting</b>	<b>3.50</b>	<b>3.88</b>	<b>1.49</b>

*Note:* The response scale is 1 (Never) - 7 (Always). All Min=1 and all Max=7.

The next set is for the incremental line item budgeting items. The mean value was 5.04 (*SD* = 1.26), median of 5.38, for the constructed incremental line item budgeting variable. These results are presented in Table 14.

Table 14

*Descriptive Statistics for Incremental line item budgeting (N = 61)*

	<i>M</i>	<i>Median</i>	<i>SD</i>
I utilize a budgeting framework driven by a base budget founded on last year's library budget	5.44	6.00	1.88
I use a base budget completely founded on last year's line item data	4.57	5.00	1.94
During the budgeting process, I make slight increases or decreases to the base budget based on future trends and projections	5.08	6.00	1.87
I set budget alternatives to a reasonable limit	4.90	5.00	1.78
By using a budget method that limits competition among budget participators, I minimize political conflict in the budgeting process	4.39	5.00	1.89
Using the current budget method, I make only marginal increases to certain budget line items to reflect new library initiatives in the budget	4.28	5.00	1.87
I always assume certain budget cost minimums for the library to function	5.32	6.00	1.75
I predict with accuracy and confidence the likely trends in certain budget lines	5.33	6.00	1.48
Every year, I account for long-term financial commitments	6.10	7.00	1.4
<b>Incremental Line Item Budgeting</b>	<b>5.04</b>	<b>5.38</b>	<b>1.26</b>

*Note:* The response scale is 1 (Never) - 7 (Always). All Min=1 and all Max=7.

In total, the analysis was conducted using 61 participant responses. This is because one individual had missing values present. This individual was not included in the analysis. The next set is for the performance/incentive budgeting items. The mean value was 3.07 ( $SD = 1.32$ ), median of 3.11, for the constructed performance/incentive budgeting variable. These results are presented in Table 15.

Table 15  
*Descriptive Statistics for Performance/Incentive budgeting (N = 61)*

	<i>M</i>	<i>Median</i>	<i>SD</i>
I utilize a planning and budgeting framework driven by library outputs, performance, and incentives	3.33	3.00	2.01
Appropriate, measurable criteria on which to judge performance in the library is an important part of my budget	3.97	4.00	1.94
Accountability and quality are represented in my budget by the use of performance measure of central tendency	3.62	3.00	1.99
I rely heavily on performance measure of central tendency and performance evaluations of expected library activities rather than fulfilling library objectives	2.85	2.00	1.69
Within the current budget, I manage a university or externally mandated goal to which library monies are exclusively connected but only if that goal is achieved	2.26	2.00	1.66
Within the current budget, I set a library goal(s) to which monies are exclusively connected only if that goal(s) is achieved	2.23	2.00	1.50
During the budget process, I formulate and classify activities (not objectives) to make my budget decisions	3.25	3.00	1.80
I develop performance measure of central tendency to make my budget decisions	2.80	3.00	1.65
I review performance evaluations to make my budget decisions	3.30	3.00	2.03
<b>Performance/Incentive Budgeting</b>	<b>3.07</b>	<b>3.11</b>	<b>1.32</b>

*Note:* The response scale is 1 (Never) - 7 (Always). All Min=1 and all Max=7.

The next set is for the responsibility/cost center budgeting items and is presented in Table 16. The mean value was 3.44 (*SD* = 1.65), median of 3.83, for the constructed responsibility/cost center budgeting variable.

Table 16  
*Descriptive Statistics for Responsibility/cost center budgeting (N = 61)*

	<i>M</i>	<i>Median</i>	<i>SD</i>
I utilize a planning and budgeting framework that must balance library income with expenditures	4.54	5.00	2.53
I use a completely self-supporting budget	2.05	1.00	1.87
I use a partially self-supporting budget	2.85	2.00	2.21
I divide the library budget into cost centers to track monetary inflows and outflows	3.38	2.00	2.34
By using cost centers, I identify and track fiscal accountability in the library	3.36	2.00	2.44
If library income is lost, I must cut expenditures to keep the budget balanced	4.48	6.00	2.55
<b>Responsibility/Cost Center Budgeting</b>	<b>3.44</b>	<b>3.83</b>	<b>1.65</b>

*Note:* The response scale is 1 (Never) - 7 (Always). All Min=1 and all Max=7.

#### *Summary of Composite Variables*

The descriptive statistics for the composite variables are summarized in Table 17. The resulting scores that were computed for the composite variables were a minimum of 1.00 to a high of 7.00. A score of 1.00 indicated that the individual reported infrequent use and a higher score indicated that the individual reported more frequent use.

Table 17  
*Descriptive Statistics for Resource Allocation Strategies in Extensive Academic Libraries  
 Questionnaire Variables (N = 61)*

	<i>M</i>	<i>Median</i>	<i>SD</i>
Incremental Line Item Budgeting	5.04	5.38	1.26
Program Budgeting/PPBS	4.40	4.83	1.71
Zero Based Budgeting	5.50	3.88	1.49
Responsibility/Cost Center Budgeting	3.44	3.83	1.65
Formula Budgeting	3.27	3.17	1.40
Performance/Incentive Budgeting	3.07	3.11	1.32

*Note:* The response scale is 1 (Never) - 7 (Always). All Min=1 and all Max=7.

### *Hybrid Mode Analysis*

As outlined in Chapter 3, a budget activity sorting matrix was developed to identify the directors' budgeting activity selections (N=62) for patterns of strategy use. By questioning the directors on their use of specific budgeting activities, a better understanding of their daily practices may be developed without an assumed definition of a specific strategy. The sorting matrix was developed in response to a concern that the library directors in this study may not have a consistent and unified definition of one or all of the six budgeting strategies in question.

A standard error of measurement (SEM), a measure of the spread of the directors' frequency scores, was calculated twice above the composite mean for each of the six budgeting strategy subsets. The SEM was used to develop a basis for comparison to determine which budgeting strategy(s) the director was using based upon his or her activity selections. When the directors' budget mean was higher than the 2 SEMs above the mean, the director was identified as using that particular budgeting strategy. If the



director's mean was less than 2 SEMs above the mean, the director was identified as not using that particular budgeting strategy. If a director's composite score was greater than 2 SEMs above the mean on more than one composite, the director was categorized as using more than one budgeting strategy.

Using the SEM analysis, four study participants could not be sorted due to extreme differences between the SEM basis and each of the director's six budgeting means. Upon further analysis of the four individuals' responses, each was found to have very little formal financial training. Three directors selected on-the-job training as the only source of financial preparation and one director selected on-the-job training coupled with conference participation. The lack of individual financial management training could be the reason why these individuals could be identified as using specific budgeting strategy(s). It is also possible that the four individuals' responses were unable to be analyzed due to a weakness with the study instrument. Further implications of this study would be the performance of a factor analysis to pursue the reliability and validity of the study instrument in greater depth. The results of the sorting analysis are presented in Table 18.

Table 18  
*Frequency Statistics for Director Budget Activity Sorting Matrix*

Budget Strategy(s)	Frequency (N = 62)	Percent
Multiple Budgeting strategies, min. of 2 and max. of 5 strategies	15	.24
Incremental Budgeting	8	.13
Program Budgeting	8	.13
Responsibility/Cost Center Budgeting	6	.09
Performance/Incentive Budgeting	5	.08
Formula Budgeting	4	.07
Zero Based Budgeting	4	.07
Program, Zero Based and Performance/Incentive Budgeting	4	.07
Incremental Budgeting and Program Budgeting	2	.03
Program Budgeting and Zero Based Budgeting	2	.03
Unable to determine	4	.07
Total	62	100.0

To test the hypothesis that these library directors are only using one budgeting strategy, a chi square goodness of fit test was chosen to see if these library directors' frequency distribution fit a specific pattern. The chi square test is one of the most essential and used members of the nonparametric family of statistical tests. It is employed to test the difference between an actual sample and another hypothetical or previously established distribution (Hinkle, Wiersma, & Jurs, 2003).

Due to the insufficient sample size needed to test the 7 strategy groups, the six budgets and the hybrid selection, the budget strategy categories were collapsed into one category of one budgeting strategy. Using SPSS, a chi square goodness of fit test was

conducted assuming the null of 75% of directors use only one budgeting strategy versus 25% of directors using more than one strategy. The assumption of the 75/25% split was based upon a general postulation that library directors are only using one budgeting strategy (Goldstein, 2005; Linn, 2007). The chi square was significant,  $\chi^2 (1) = 32.71, p = .001$ , with fewer directors using only one method than expected, and more using multiple methods. A chi square using a more conservative 60/40% split of directors usage was also significant,  $\chi^2 (1) = 6.992, p = .008$ . Observations were independent and identically distributed—that is multinomial with a specified probability distribution. Categories were mutually exclusive and exhaustive and the sample size was sufficient. All chi square assumptions were satisfied.

To further develop the understanding of library director practices, the frequency distributions for the participant's self-selected budgeting choice (s) are presented. Participants were asked to "*please select any of the following budgeting methods (if any) that you currently use to administer the general operating budget in your library*". The six budgeting strategies were listed and an additional category of Other/Hybrid/None Listed with a write-in space was provided. The results for these characteristics are presented in Table 19. The only write-in response for Other/Hybrid/None Listed was "seat of pants".

Table 19  
*Frequency Statistics for Question 56, Directors' Own Strategy Choices*

Budgeting Strategy	Frequency (N = 62)	Percent
Multiple Budgeting strategies, min. of 2 and max. of 6 strategies	15	.24
Incremental Budgeting	14	.22
Incremental Budgeting <i>and</i> Program Budgeting	7	.11
Formula Budgeting	4	.06
Other/Hybrid/None Listed	4	.06
Program Budgeting	3	.04
Zero Based Budgeting	3	.04
Responsibility/Cost Center Budgeting	3	.04
Incremental Budgeting <i>and</i> Responsibility/Cost Center Budgeting	3	.04
Incremental Budgeting <i>and</i> Formula Budgeting	3	.04
Incremental Budgeting <i>and</i> Performance/Incentive Budgeting	2	.03
Performance/Incentive Budgeting	1	.01
Total	62	100.0

The results of Tables 19 and 20 were compared to examine if the directors' activities and their self-selected budgeting strategy(s) were the same, different or similar. Fourteen directors budgeting strategy(s) were the same (22%) and 16 were not the same (25%). Twenty-eight (45%) responses were similar with at least one shared budgeting strategy between the comparisons. Four could not be determined (6%).

In summary, there is evidence that these library directors are using more than one budgeting strategy to manage their operating budget. Implications of the use of multiple as well as rational and political strategies will be discussed in Chapter 5.

*Descriptive Analysis of Research Question Two*

2. What are the internal and external conditions of the library environment that precipitate the use of such strategies?

Items from the questionnaire using the frequency scales and structured, open-ended questions provided data to answer the second research question. Questions 50-55, which asked participants to rate their frequency on general budgeting conditions, are presented in Table 20.

Table 20  
*Descriptive Statistics for General comments on budgeting (N = 61)*

	<i>M</i>	<i>Median</i>	<i>SD</i>
The economic conditions surrounding my library are constantly changing	5.33	6.00	1.68
I do not have the supply of financial resources that I need to meet the current demand of library services	5.69	6.00	1.58
University mandates are a factor in my budgetary decision making	4.57	5.00	1.81
Institutions or bodies external to my university and library are factors in my budgetary decision making	5.75	6.00	1.35
Overall, I must acknowledge the importance of various internal or external conditions to the library environment when considering the allocation of my operating budget	5.98	6.00	1.25
To respond to internal/external conditions or pressures, my budgetary decision making must be flexible regardless of how I routinely craft my budget	6.07	6.00	1.19

*Note:* The response scale is 1 (Never) - 7 (Always). All Min=1 and all Max=7.

Three structured, open-ended questions 57, 58 and 59 (N=48), allowed the library director to write general comments about the budget strategy selected in question 56 and the general conditions of the library environment regarding internal and external

conditions to the library and university and issues of change. In questions 60, 61, and 62, the director is asked closed and open-ended questions on why the strategy(s) listed in question 56 is being used and if the library director will be changing the budgetary strategy(s).

Participant responses (N=48) were analyzed for emerging themes and common patterns. In question 57 (N=48), participants were asked if there were particular internal or external conditions to the university (as compared to just the library) that precipitate their use of the budget strategy selected in question 56. Several themes emerged to include: unpredictable fluctuations in income and expenditures, unfunded mandates, continuance of the status quo, and the importance of voluntary/involuntary student library fee and other student based initiatives. All themes are listed in Table 21.

Table 21

*Internal and External Conditions to the Library Environment*

Condition	Description
Internal conditions	<p>Fluctuations in university expenditures are considerable. The university underfunds the library. Funding is tight with no increases for most years and with recent cuts to the budget. University accounting practices and administrative allocations of funds change. Changes to college work study program (availability of awards and money), university goals and assuming costs for capital expenditures impact the budget. Students have a small role in allocation process with voluntary/involuntary student library fee and other student based initiatives. University emphasis on improving research skills of undergraduates influences available library resources.</p>
External university conditions	<p>Substantial fluctuations in state revenues and state accounting practices change. State can control campus determination of serials budget, multi-year campus commitments to consortia, ILS system, and grant funding which supplements regular budget for serials.</p>
Both internal and external university conditions	<p>Continuance of the status quo and university or state only intervenes with the budget unless there is a problem. Unfunded mandates and mandated items (such as merit increments for classified staff) that are funded only in part coupled with expectations of top administration are out of alignment with library capabilities. "Tinkering at the edges" of a shrinking budget is the only latitude. The base budget is determined by state and the board of regents. Any enhancements to the base budget are made by provost upon request, justification and availability of funds. Library director is limited in available options with these two parties.</p>

In question 58, participants were asked if there were particular internal or external conditions to their library that precipitate their use of the budget selected in question 56. Themes included a lack of financial resources, staff salaries, changes in technology, inflation and serials, and various cost factors. These are listed in Table 22.

Table 22

*Internal and External Conditions to the Library Budget (N=48)*

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Library Conditions

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The budget is very tight allowing little or no flexibility in spending. Programs are funded at a level to keep them operational. The budget is formulated primarily in terms of the day to day realities. Incrementalism maintains the status quo. Serials inflation, database/online journal inflationary increases, software inflationary increases, subscriptions to e-resources; cost of foreign currency to purchase international publications, and rapid increases in electronic costs assessed by parent institution make print purchases problematic. Job creation is frozen or reduced but the need to add personnel to meet programming expectations is great. There is pressure to increase existing staff salaries due to university standards. Responsibility for modernizing/upgrading physical structures and technology infrastructure, the evolution of services (increases and decreases; shifts in technology); collaboration with other campus units such as IT and the need to expand facility and re-purpose space influences library resources and budgeting. Budget must be able to withstand rapid cost changes such as minimum wage, postal rates, night guard contract costs and storage building licensing fees.

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In question 59, participants were asked if there were changing conditions that were facilitating their use of their budgeting strategy. Themes included implementation of specific types of budgets to meet library demands, change in administration of university budget, the need and/or burden to repurpose funds for new programs, influence of/on staffing, and the need for flexibility. These are listed in Table 23.



Table 23  
*Changing Conditions (N=48)*

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Library Condition Themes

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Budget is based on survival, budget reductions and an overall lack of funds. Repurposing of funds enables the addition of new programs, more computers and multimedia, group study rooms, etc.; need to replace a portion of computers and servers and network infrastructure. “We are merely trying to survive as a library, not a glorified computer center”.

Budget methods are chosen to address specific issues. Examples include implementing cost center funding as the university implements a new financial system. The legislatures, regents, office of the president, campus, all impact the library budget. Exchange rate fluctuations require budgeting by objective.

Additional expertise in key positions which manage budgets, inclusion of more staff in budget process. Enhanced communication on the budget with an increased effort in planning.

Budget method has to flexibly adjust to a larger percentage of the budget tied up in ongoing commitments such as license agreements and subscriptions.

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The frequency distributions for the participant’s reason for specific budgeting choices from question 60 are presented in Table 24. For those that provided a response, the most frequent reason for use was “it meets our needs best” (51%), which was followed by “we are under an administrative mandate that requires the use of the strategy” (16%). Overall, 8 of the participants provided multiple responses as to why they are using the budgeting method. The multiple response of “it meets our needs best and we are under an administrative mandate that requires the use of the strategy” (13%) and “it meets our needs best and we inherited the strategy” (10%) were the most frequent responses.

Table 24  
*Descriptive Statistics for Reasons for Budget Use (N=31)*

Response Selected	Frequency (N = 31)	Percent
It meets our needs best.	16	51.60
We inherited the strategy.	2	6.60
We are under an administrative mandate that requires the use of the strategy.	5	16.10
It meets our needs best and we inherited the strategy.	3	9.70
It meets our needs best and we are under an administrative mandate that requires the use of the strategy.	4	12.90
We inherited the strategy and we are under an administrative mandate that requires the use of the strategy.	1	3.10

In question 61 (n=32), participants were asked if they had plans to change their current budgeting strategy. The frequency distributions for the participant's reasons for their budgeting choices were calculated. For those that provided a response, the most frequent response to change was "No, if we need to make modifications to our current strategy we will but we will not change to a completely new budgeting strategy" (53%) which was followed by "No, our current strategy works" (31%). Three participants provided multiple responses as to the status of their budget plans. The response of "No, our current strategy works and if we need to make modifications to our current strategy we will but we will not change to a completely new budgeting strategy" (9.4%) was the only multiple response. The results are presented in Table 25.

Table 25  
*Descriptive Statistics for Plans to Change Budget Strategy, (N=32)*

Response Selected	Frequency (N = 32)	Percent
No, if we need to make modifications to our current strategy we will but we will not change to a completely new budgeting strategy	17	53.20
No, our current strategy works	10	31.30
We would like to change our strategy to one that better meets our needs but it is currently “under discussion” or “under review”	4	12.50
Yes, we are formulating long term plans to start using a new budgetary strategy	1	3.0
Yes, we are implementing short term plans to try a new budgeting strategy	0	0

### Summary

The three-tiered purpose of this study was to examine what resources allocation strategies are being used in academic libraries (if any), if a hybrid mode emerges, and to describe the internal and external conditions of the library environment. Three sections outline the data findings in this chapter. First, the demographics of the participants and an overview of the libraries and universities that the participants represent were presented. The second section reported a descriptive analysis of the first research question. The third section reported the results of the structured, closed and open-ended questions on the library environment involving the second research question. This chapter showed data presented primarily in table form. In Chapter 5, a summary of the findings of the study along with conclusions that can be drawn based on the questionnaire and recommendations for library staff and future researchers will be presented.

## CHAPTER 5: RECOMMENDATIONS AND CONCLUSIONS

The purpose of this study was to examine what resource allocation strategies (if any) are being used in university (extensive) academic libraries and to examine any internal and external financial pressures and/or conditions in the library environment. Overall, study respondents do employ the six most common budget strategies in their academic libraries to varying degrees. Multiple types of budgeting strategies, either chosen or inherited by the library director; appear to be used to allocate scarce resources. It would also appear that these library directors address challenges both internal and external to the university that they serve.

In this chapter, the summary and analysis of the first and second research questions are presented. Other chapter components include recommendations for policy and practice and implications for further research.

### Summary of Significant Findings

#### *Research Question #1*

1. What resource allocation strategies are used by the directors of doctoral/research university (extensive) libraries? Which strategies are most and least frequently used? From participant responses, does the use of a hybrid mode emerge?

The most relevant strategy suggested by the data in this study is the use of a hybrid strategy or a budget strategy that incorporates two or more of the resource allocation strategies identified in this study as either formula, program/PPBS, ZBB, incremental line item, performance/incentive, and responsibility/cost center budgeting. From the two different methods used to identify the budget strategies in use, the budget

activity sorting matrix and the directors' own selection of a budgeting strategy(s), there is agreement that multiple budget strategies are being used by these libraries directors.

From the self selection survey question, 34 directors selected using multiple or more than one budgeting strategy to administer the general operating budget. From the sorting matrix, 15 study respondents were identified as using a *minimum* of 2 different budget strategies to administer the library general operating budget.

To further understand the finding of a hybrid strategy use in this study, a chi square goodness of fit test was conducted to test the hypothesis that library directors in this study only use *one* budgeting strategy to manage their resources as assumed by library management literature. Assuming the null of 75% of directors use only one budgeting strategy versus 25% of directors using more than one strategy, the test was significant,  $\chi^2 (1) = 32.71, p = .001$ , with fewer directors using only one method than expected, and more using multiple methods. These results suggest that the directors in this study are using more than one budgeting strategy to manage their library resources.

Resource allocation is a complex process and the use of multiple strategies suggests a dynamic way of distributing scarce resources. Library directors (51%) characterize their strategy selection as one that best meets their needs with few (n=5) under an administrative mandate to do so with the majority of directors (53%) stating that before a new budgeting strategy would be implemented the existing budget strategy would first be modified. Instead of identifying any one strategy as being more or less frequently used, the indication of the use of more than one and the directors' willingness to modify strategies develops a richer resource allocation picture for these directors.

The data in this study also suggest that of the six budgeting strategies in use, incremental budgeting is a major budgeting tool to manage resources in these libraries. From the sorting matrix, 8 study respondents were categorized as using only incremental budgeting. From the self selection survey question, 14 respondents selected incremental budgeting as the only primary budget strategy in use. The survey data suggest that incremental budgeting with the ability to track large records of budget lines especially important to long-term fiscal commitments and other types of tying contracts is a needed historical record keeper to assist these library directors in examining patterns of past expenditures and forecasting future trends.

In summary, respondents in this study, many directing the nation's top research libraries, employ the six most common budget strategies to varying degrees. However, hybrid strategy use is notable and worthy of further study. This study has also suggested that these library directors use incremental budgeting as a major tool to manage their library resources. Coupled with the directors' willingness to modify existing budgets, it is suggested that the directors in this study are using multifaceted strategies to manage complicated library resources.

#### *Research Question #2*

2. What are the internal and external conditions of the library environment that precipitate the use of such strategies?

The responses to the questions in the second and third sections of the study questionnaire (N=62) provide a contextual picture of the conditions and challenges faced by library directors. A summary of the significant findings of the library directors'

comments on the internal and external conditions of the library environment are presented in this section to characterize current library budgeting circumstances.

A summary of the study demographics suggests that public universities (68%) are predominant in this study as compared to private institutions (32%). Campus populations are large with undergraduate FTEs over 15,000 students and staff and faculty at over 1000 employees each. The individuals responding to the questionnaire are highly experienced professionals with the majority possessing more than 25 years of experience in an academic library. The majority of library administrators are female (65%) employed as either Director or Dean of Library(s) and self-report as being responsible for the management of the library operating budget. The libraries in question are large with a range of 51 to 100 full time staff members managing well in excess of 1,000,000 volumes. The directors in this study have characterized the library environment as dynamic, complicated and difficult. This view would seem to support the characterization of a multi-campus university environment with numerous libraries responsible for supporting large numbers of staff, faculty and students.

Although participants (N=61) selected multiple types of financial training from graduate degrees to conference participation, on-the-job training, selected by 36 library directors (58%), is the frequent source of financial training followed by a graduate degree, selected by 15 directors (21%) and conference participation, by 13 directors (13%). The on-the-job training response appears noteworthy for further study and will be discussed under the implications for practice section in this chapter.

The data in this study support the academic literature in that there are a number of varied and complex conditions found to have an impact on the library budgeting process

(Brown & Gamber, 2002; Budd, 2005; Linn, 2007; Warner, 1998). Participants (N=48) were asked if there were particular internal or external conditions to the university (as compared to just the library) that precipitate their use of their selected budget strategy(s). Several themes emerged to include: unfunded mandates, unpredictable fluctuations in income and expenditures, continuance of the status quo, changes in technology, serials inflation, the importance of voluntary/involuntary student library fee and other student based initiatives, and various cost factors. The significance of unfunded mandates will be discussed under the implication for policy section in this chapter.

Director responses suggest that these library conditions are affected by the constant and unpredictable fluctuations in university revenue; the limiting of library funds; the inability to maintain and hire employees especially those with significant finance and budgeting experience; the influence of outside parties on the library's base budget; the impact of unexpected and often, inflationary cost changes; and the burden of responsibility for maintaining a technological infrastructure including up-to-date computer hardware and software, internet access, and computer lab space. Library directors also report that financial resources are less than necessary to meet the demand for library services.

Dissatisfaction of the status quo was commonly mentioned by library directors in all three structured, open ended survey questions about the library environment. The status quo is defined as the existing order of things; present customs, practices, and power relations (Weber, 2002). As previously noted, participants in this study reported a substantial use of incremental budgeting activities (see Table 14). This fact is noteworthy in the context that the majority of the library directors expressed dissatisfaction with the



status quo coupled with the use of incremental budgeting. The centralized, incremental approach to budgeting does not work well in circumstances requiring flexible, creative responses to financial problems. It tends to favor the status quo with dwindling resources (Budd, 2005; Caruthers & Orwig, 1979; Lasher & Greene, 2001; Linn, 2007; Vandament, 1989; Welzenbach, 1982). Although the scope of this study did not include the in depth analysis of the impact and consequence of the status quo on the library resource allocation process, future studies may be needed to contribute to the status quo discussion. The use of incremental budget activities and the continuance of the status quo are appear worthy of further analysis.

Lastly, the data suggest library conditions are susceptible to high levels of change, especially with regard to unfunded mandates, and library directors' budgetary decisions must be flexible regardless of the type of budgeting strategy(s) in place. Participants (n=32) were asked if they had plans to switch their current budgeting strategy for a new one. For those that provided a response, 43% stated that modifications would be made to the existing budget strategy before a completely new budgeting strategy would be implemented. Library directors contend their response to internal/external conditions or pressures must be flexible regardless of routine budget crafting. The need for flexibility, predicated by a rapidly changing financial environment, is a frequent survey comment by directors. The study data suggests that flexibility could be a necessary accommodation in order to successfully manage the library budget.

In summary, the comments by library directors support the library administration and higher education literature on the complex internal and external conditions of library finance. The issue of the continuance of the status quo was a frequent theme from

respondent's comments. Regardless of these dynamic and complicated internal and external conditions, the library directors appear to use flexibility to successfully manage their budget. Many directors comment on the budgeting process as an activity of survival and budget methods are specifically chosen to address particular financial purposes. Flexibility does appear as a noteworthy contextual feature of the library environment characterized in this study.

#### Recommendations for Further Research

The results of this study indicate the significant use of budget hybrids by these library directors. Additional research in recognizing the use and impact of budget hybrids is suggested to continue to provide the library community with more insight into this resource allocation process. Research recommendations include a study on the effectiveness of the use of hybrid budgets in academic libraries as compared to single budget use libraries. Future studies could also explore the important role of budget flexibility in the library resource allocation process for these directors with research on flexibility, budget modification and improved resource allocation connections. In search of appropriate budgeting strategies, Lasher and Greene asked "Where is higher education budgeting going in these times of persistent uncertainty" (2001)? Future studies of the dynamic, stressful and overly inflationary library budget processes could have implications for wider higher education communities.

#### Implications for Policy and Practice

In this study, understanding the evolving nature of resource allocation in the academic library at doctoral/research universities (extensive) which often include collections in excess of 1,000,000 volumes, operating expenditures from \$10,000,000 to

\$110,850,000 and up to 1,277 employees has been investigated to fill a research gap (ARL, 2008). This study has contributed to the library finance discussion by identifying how library directors manage resources, generating current data on the resource allocation processes of the nation's top university libraries. The data in this study also contribute to the larger understanding and discussion of higher education finance by capturing the current internal and external conditions of the library environment, and providing a demographic profile of the individuals responsible for the financial management of more than \$1 billion every year.

As institutions actively review budgeting tools in search of ways to better allocate scarce resources, research on recommendations for policy and practice are more important than ever (Zierdt, 2009). This study found many issues external to the academic library in need of policy review and consideration. The issue of unfunded mandates for library directors in this study is most noteworthy. The complaint of unfunded mandates is frequent in this survey and the scope of this issue is wide-ranging which further contributes to the complicated nature of this problem. Unfunded mandates are generally considered any rules or regulations that impose costs on library directors and their budgets for which they are not reimbursed (Budd, 2005).

For library directors, unfunded mandates come from external parties such as the federal and state governments and also from groups internal to the university. Many education program costs have been shifted from the federal government to the states without corresponding funding (Reyes, 2006). Given that at the national level, state appropriations of tax funds for higher education expenses have become stagnant, library directors are increasingly faced with the impact of that limited funding on multiple levels

(Wood & Walther, 2000; Zumeta, 2004). Unfunded mandates coming from varied sources from inside the university can take on many forms. For example, campus units normally other than the library, have the primary responsibility to provide all primary instruction and courseware tools to students. However, the library has a critical role in providing library instructional content to support those educational courses and programs. Without the proper infrastructure, academic libraries cannot reach the majority of students' at the most appropriate time in the curriculum (Reyes, 2006). An internal problem suggested by study participants as an unfunded mandate included the funding of employee salaries. Although the funds to increase library employee salaries were absent from the library budget appropriations, directors in this study commented on an unspoken pressure to improve staff salaries or to offer merit pay. One Director commented on pressure from a superior to improve library staff morale with merit pay yet no access to funds was ever made available. Another Director commented that even though no funds were given to dispense, salary increases were expected because of the library staff's perception that if there was a general decrease in the availability of librarians, salaries should increase based on any vacant positions and unspent wages. This is just one example of how the issue of unfunded expectations is problematic and difficult to solve.

From copyright and electronic format mandates imposed by the Government Printing Office (GPO) to interdepartmental program goals which require new resources to accomplish but are not directly funded; these various unfunded mandates place a high burden on the resource allocation process. Without new resources, unfunded mandates are extremely difficult to achieve in the academic library (Budd, 2005; McGraw, 1999; Smith, 2007). Resource allocation is a difficult process and unfunded mandates strain

library resources and often yield only binary choice making. Many library directors struggle with their university development officers to raise funds to support unfunded mandates. Mellon grants and petitions to the Gates Library Foundation (GLF) are sources that many library directors feel that they have to mine to meet these unfunded goals (Library, 2010). Although the impact of private fundraising is outside the scope of this research, it must be mentioned here to comment on the impact of private funding to the solving the problem of unfunded mandates. Those who propose unfunded mandates must realize that many university library directors must appeal to outside sources for funds. Many directors compete for the same pool of private funding sources as other similar library directors and meeting the goals of unfunded mandates are almost impossible (Budd, 2005; McGraw, 1999; Smith, 2007).

The implication for policy is problematic for numerous reasons. At the state level, unfunded mandates appear to be a part of a larger policy dilemma. A joint report from The National Center for Public Policy and Higher Education and The National Center for Higher Education Management Systems (2010) cites an aging higher education policy infrastructure as the reason why policies to solve higher education problems are lacking (Callan, Ewell, Finney, Jones, & Zis). The problems associated with unfunded mandates are further complicated by the need for a public policy redesign. If college presidents and other institutional administrators are indeed operating on an old set of rules, attempts to redesign academic policy may very well be abandoned to simply replace lost government funds with tuition increases and large capital campaigns without solving the systemic problems of the higher education funding process (Callan, Ewell, Finney, Jones, & Zis, 2010). Library directors may simply find themselves, along with other higher education

administrators, with little choice to navigate these types of unfunded mandates as appropriate as they appear.

Siess (2003) suggests one way to deal with unwanted policies such as unfunded mandates. The role of the library director as public relations expert may allow a communication with university leadership and other vital parties to plead the library's case. By making services both visible and valuable to the community, and by getting the word out using proven marketing, customer service, and public relations tactics specifically tailored to the library environment, Siess suggests that directors could minimize budget threats such as unfunded mandates by reminding all parties of the value-added results provided by the academic library. By publicizing the harm of unfunded mandates to the university and ultimately, the library budget, library directors should continue to make their case that libraries are a critical part of the accreditation process and that adequate support for this cost center is essential. By creating policies that try to stabilize the volatile library environment, university presidents, provosts and state legislators act to improve conditions on behalf of the library and strengthen the greater university or university system (Balderston, 1995, Hisle, 2002). As outlined in this study, the importance of understanding financial management in academic libraries is vital to the continued improvement of academic libraries and the overall academic mission of higher education institutions.

Implications from empirical studies are also necessary for the improvement of practice. This study identified many issues in need of practice review and consideration. After a review of library finance, the budget activities of directors, and the library environment, the data suggest a need for answers to additional research questions. In this

study, the use of multiple budget strategies has surfaced as a noteworthy part of the resource allocation in libraries. Many questions are raised by the implication of this practice. With the use of a hybrid budget indicated, what is the process by which library directors blend these budgets? Are library directors working with their staff collaboratively to merge budget activities to meet their financial needs? To fully explore the implication of the use of budget hybrids, additional research is suggested to explore the relationships between the director, the library staff, and the resource allocation process.

If the dynamic way in which directors are successfully accommodating the complicated distribution of resources to meet institutional demands is understood in more detail, the ways in which library directors justify and defend how their resources are allocated may become more understandable to parties outside of the academic library.

Other study data with practice implications would include a detailed analysis of the financial training of academic library directors. This study revealed that a large percentage of library directors primarily received on-the-job training for their financial preparation. The financial training of library directors is challenging in a stressful, changing economic environment given the privacy, monetary, and time constraints (Brunner, 2009). In spite of the reasons why a more structured, formal financial management class might be overlooked or postponed, library directors should devote the necessary resources to develop their budgeting knowledge and skill set for improved resource allocation and engage in a regular, systemic program of continuing education (Brunner, 2009; Budd, 2004, Linn, 2007; Lynch & Smith, 2001). Given the monetary and time constraints on keeping pace with the overall library management and planning, the

negotiation of contracts for services, materials, and equipment, the supervision of library employees, and the performing of public-relations and fundraising duties; a lack of time could certainly account for the minimal formal financial training of the study's library directors (Linn, 2009). Further implications from this study would be specific research investigating the financial literacy of library directors and the development of a characterization of what constitutes on-the-job financial training in these libraries.

The full scope of this training for these directors is relatively unidentified and in particular, if library directors are working closely with financial professionals on campus to manage their budgets, how closely aligned are the library directors to other university leaders and what they are doing at the university? Are the library directors collaborating with these other leaders? Is a close alignment between these parties a help or a hindrance to the library resource allocation process? More research is required to know more about these directors and their intercampus relationships. Answers to these questions could provide valuable insight into the types of practices most useful to library directors to manage their resources.

### Concluding Comments

Over the years, the scope of resource allocation strategies has widened and has emphasized the need for more research. Resource allocation continues to be relevant today, even when the validity of certain strategies has subsequently been questioned (Birnbaum, 2000). This study has contributed insights into the budgeting strategies used at university (extensive) libraries. By using multiple budgeting strategies, both rational and political, the library directors in this study are innovatively managing the library resource allocation process. As stated by ACRL, "*higher education will increasingly*



*view the institution as a business. Today, universities are extremely focused on fundraising, grant writing, maximizing revenue, reducing costs, and optimizing physical space. Do academic libraries have sufficient data to defend how their resources are allocated?[italics added]” (2007, p. 2).*

Library directors will be in a better position to defend and justify their future resource allocation process with increased professional development to enhance budgeting competencies, additional dialogue between library and university administrators on which budget strategies are being used and with what results, and the collaboration between library directors and other relevant parties to minimize volatile conditions in the library environment.

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## Appendix A

### Glossary

**Academic Library** - A library that is part of an academic institution such as a college or university. An academic library supports the curriculum and research needs of its students, faculty, and staff.

**Carnegie Classification** - All accredited, degree-granting colleges and universities in the United States represented in the National Center for Education Statistics IPEDS system are eligible for inclusion in the Carnegie Classification. The classification has been widely used in the study of higher education since 1973, both as a way to represent and control for institutional differences, and in the design of research studies to ensure adequate representation of sampled institutions.

**Doctoral/Research Universities—Extensive** - These institutions typically offer a wide range of baccalaureate programs, and they are committed to graduate education through the doctorate. During the period studied, they awarded 50 or more doctoral degrees per year across at least 15 disciplines.

**Doctoral/Research Universities—Intensive** - These institutions typically offer a wide range of baccalaureate programs, and they are committed to graduate education through the doctorate. During the period studied, they awarded at least ten doctoral degrees per year across three or more disciplines or at least 20 doctoral degrees per year overall.

**Master's Colleges and Universities I** - These institutions typically offer a wide range of baccalaureate programs, and they are committed to graduate education through the master's. During the period studied, they awarded 40 or more master's degrees per year across three or 2 more disciplines.

**Master's Colleges and Universities II** - These institutions typically offer a wide range of baccalaureate programs, and they are committed to graduate education through the master's degree. During the period studied, they awarded 20 or more master's degrees per year.

**Elastic good** - In economics and business studies, price elasticity of demand is an elasticity that measures the nature and degree of the relationship between changes in quantity demanded of a good and changes in its price. Goods with an elastic demand experience a sharp change in the percentage of quantity demanded when its price increases or decreases. A simple explanation for this type of a good would be a luxury good.

**Free rider problem** – Economic term characterizing the problem associated with an individual's desire to minimize any demand derived cost. In this study's context, if an academic department knows another department uses a specific journal or serial, the administrator may not include the cost of the materials in the budget because he or she knows the other department will pay for it from their budget.

**Inelastic good** - Goods with an inelastic demand do not experience sharp changes in the percentage of quantity demanded with price fluctuations. A simple explanation for this type of a good would be a necessity. Most library information materials are inelastic.

**Opportunity cost** - The cost of passing up the next best choice when making a decision or simply, the cost of making any choice.

**Public good** - In a university environment, many consider the library a public good, given the university mission, it is not possible to exclude individuals from joining library services.

**Reengineering** - The fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service and speed.

**Strategy** - Term used to describe the differentiating activities an organization pursues to gain a competitive advantage.

**Target base budgeting** - Alternative name for ZBB, zero base budgeting.

**Sources:**

Carnegie Classifications of Institutions of Higher Education,  
<http://www.carnegiefoundation.org/classifications/>

Merriam-Webster Dictionary, <http://www.m-w.com/>

Appendix B  
Resource Allocation Strategies in Extensive Academic Libraries

Information Sheet

IRB #030818

You are invited to take part in a research study under the direction of Dr. Walter Brown of the Graduate School of Education and Human Development at The George Washington University. Before you decide to be a part of this study, you need to understand the risks and benefits. This information sheet provides information about the research study.

- The purpose of this study is to find out what administrative activities library directors perform to budget their library resources and the state of the economic environment that the activities are performed in. You are asked to participate and return your questionnaire by *September 30, 2008*.
- The total amount of time you will be asked to volunteer for this study is approximately 20 minutes, which is the estimated time required to complete a written questionnaire.
- There are no costs or benefits associated with taking part in this study.
- Your participation in this research study is voluntary. You may decide not to begin or to stop this study at any time. There are no physical risks associated with this study. There is, however, the possible risk of loss of confidentiality. Every effort will be made to keep your information confidential, however, this cannot be guaranteed. Some of the questions we will ask you as part of this study may make you feel uncomfortable. You may refuse to answer any of the questions and you may take a break at any time during the study. You may stop your participation in this study at any time.
- If results of this research study are reported in journals or at scientific meetings, the people who participated in this study will not be named or identified. GW will not release any information about your research involvement without your written permission, unless required by law.



- The Office of Human Research of George Washington University, at telephone number (202) 994-2715, can provide further information about your rights as a research participant. If you think you have been harmed in this study, please report this to the Principal Investigator of this study or call the Office of Human Research immediately.
- To ensure anonymity, your signature is not required in this document unless you prefer to sign it. Your willingness to participate in this research study is implied if you proceed with completing the questionnaire.
- Please keep a copy of this document in case you want to read it again.
- Further information regarding this study (including an additional copy of the questionnaire) may be obtained by contacting Barbara Blake Gonzalez, a doctoral candidate, at 757-237-4485 or [bbg@gwu.edu](mailto:bbg@gwu.edu)
- Completed questionnaires should be mailed in the preaddressed, stamped envelope provided to:

Barbara Blake Gonzalez

223 Sir Oliver Road

Norfolk, VA 23505

If you do not wish to participate, please notify the researcher at [bbg@gwu.edu](mailto:bbg@gwu.edu) and no further questionnaires will be sent to you.

## Appendix C

### Academic Libraries Questionnaire

**I. Instructions:** Please select *only one* answer for questions 1- 3:

Code 2-70

1. Complete each category for your university:

a. Number of FTE or full-time student equivalent undergraduate students:

\_\_\_\_ Less than 2500

\_\_\_\_ 2501- 5000

\_\_\_\_ 5001-9999

\_\_\_\_ Over 10,000 – 14,999

\_\_\_\_ Over 15,000

b. Number of FTE or full-time student equivalent graduate students:

\_\_\_\_ Less than 2500

\_\_\_\_ 2501- 5000

\_\_\_\_ 5001-9999

\_\_\_\_ Over 10,000 – 14,999

\_\_\_\_ Over 15,000

c. Number of Full Time Staff:

- \_\_\_ 0-50
- \_\_\_ 51- 100
- \_\_\_ 101-249
- \_\_\_ 250-499
- \_\_\_ 500-999
- \_\_\_ Over 1000

d. Number of Full Time Faculty:

- \_\_\_ 0-50
- \_\_\_ 51- 100
- \_\_\_ 101-249
- \_\_\_ 250-499
- \_\_\_ 500-999
- \_\_\_ Over 1000

e. Type of University

- \_\_\_ private
- \_\_\_ public

2. Complete each category for your library:

a. Number of Full Time Library Staff:

- \_\_\_ 0-50
- \_\_\_ 51- 100
- \_\_\_ 101-249
- \_\_\_ 250-499
- \_\_\_ 500-999
- \_\_\_ Over 1000

b. Number of Part Time Library Staff:

- \_\_\_ 0-50
- \_\_\_ 51- 100
- \_\_\_ 101-249
- \_\_\_ 250-499
- \_\_\_ 500-999
- \_\_\_ Over 1000

Code 57-70

3. What is the total number of volumes in your library?

- \_\_\_ Less than 1,000,000
- \_\_\_ 1,000,001-3,000,000
- \_\_\_ 3,000,001-5,000,000

\_\_\_\_5,000,001-7,000,000

\_\_\_\_7,000,001-9,999,999

\_\_\_\_Over 10,000,000

**II. Instructions:** Please pick a number from the scale to show how often you perform each of the following budget activities in preparation and management of the library's operating budget. Circle the number in the space to the right of each item. Please select one answer for each task with the scale being as follows:

Code B 15-69

**SCALE**

**NEVER      1      2      3      4      5      6      7      ALWAYS**

**Questions 4 - 55 refer to your actions and your library's general operating budget.**

4	I budget funds that include a minimum of 6% of the general expenditures portion of the university budget for use in the library's operation.	1	2	3	4	5	6	7	Code
5	I manage the current budget method to determine the library's general operating budget.	1	2	3	4	5	6	7	
6	I utilize a budgeting framework driven by student enrollments and cost estimations.	1	2	3	4	5	6	7	
7	I utilize a budgeting framework driven by library activities and outputs.	1	2	3	4	5	6	7	
8	I utilize a budgeting framework driven by the need to justify resources for priority ranked	1	2	3	4	5	6	7	

	activities.								
9	I utilize a budgeting framework driven by a base budget founded on last year's library budget.	1	2	3	4	5	6	7	
10	I utilize a planning and budgeting framework driven by library outputs, performance, and incentives.	1	2	3	4	5	6	7	
11	I utilize a planning and budgeting framework that must balance library income with expenditures.	1	2	3	4	5	6	7	
12	I use complex mathematical calculations using FTE or full-time student equivalents to calculate the budget.	1	2	3	4	5	6	7	
13	I rely heavily on quantitative variables to estimate costs and required funding in my budget formulation.	1	2	3	4	5	6	7	
14	By relying on quantitative measurements, I perform technical budget calculations that appear rational.	1	2	3	4	5	6	7	
15	Through the operating budget, I perform mathematical calculations to provide an equitable distribution of library resources.	1	2	3	4	5	6	7	
16	My budget represents an understanding of library programs and how they work.	1	2	3	4	5	6	7	
17	My budget represents an understanding of university programs and how they work.	1	2	3	4	5	6	7	
18	I clearly provide a means to the library's end goals by using the current budgeting method to manage outputs.	1	2	3	4	5	6	7	

19	During the budgeting process, I consider alternative activities with associated costs in order to better meet program goals.	1	2	3	4	5	6	7	
20	I plan, budget and perform a cost-benefit analysis to develop the library's budget.	1	2	3	4	5	6	7	
21	Every year, I evaluate goals and objectives by starting over and assuming no budget minimums to develop the operations budget.	1	2	3	4	5	6	7	
22	Prior to being included in the budget, every year, I categorize potential budget activities and priority rank them.	1	2	3	4	5	6	7	
23	I always consider the costs and benefits for every budget activity in my budgeting process.	1	2	3	4	5	6	7	
24	I do not take budget history into account for the development of the budget.	1	2	3	4	5	6	7	
25	Every year, I justify the need for resources as a formal, written part of the library's budgeting process.	1	2	3	4	5	6	7	
26	I consider the costs and benefits for every budget activity as a part of the library's budgeting process.	1	2	3	4	5	6	7	
27	I use statements of goals and objectives to explain why and how money is being spent in the library.	1	2	3	4	5	6	7	
28	I use a base budget completely founded on last year's line item data.	1	2	3	4	5	6	7	
29	During the budgeting process, I make slight increases or decreases to the base budget based on future trends and projections.	1	2	3	4	5	6	7	
30	I set budget alternatives to a reasonable limit.	1	2	3	4	5	6	7	

31	By using a budget method that limits competition among budget participators, I minimize political conflict in the budgeting process.	1	2	3	4	5	6	7	
32	Using the current budget method, I make only marginal increases to certain budget line items to reflect new library initiatives in the budget.	1	2	3	4	5	6	7	
33	I always assume certain budget cost minimums for the library to function.	1	2	3	4	5	6	7	
34	I predict with accuracy and confidence the likely trends in certain budget lines.	1	2	3	4	5	6	7	
35	Every year, I account for long-term financial commitments.	1	2	3	4	5	6	7	
36	Overall, I use a budget that is relatively simple in its approach.	1	2	3	4	5	6	7	
37	Appropriate, measurable criteria on which to judge performance in the library is an important part of my budget.	1	2	3	4	5	6	7	
38	Accountability and quality are represented in my budget by the use of performance measures.	1	2	3	4	5	6	7	
39	I rely heavily on performance measures and performance evaluations of expected library activities rather than fulfilling library objectives.	1	2	3	4	5	6	7	
40	Within the current budget, I manage a university or externally mandated goal to which library monies are exclusively connected but only if that goal is achieved.	1	2	3	4	5	6	7	
41	Within the current budget, I set a library goal(s) to which monies are exclusively connected only if that goal(s) is achieved.	1	2	3	4	5	6	7	



42	During the budget process, I formulate and classify activities (not objectives) to make my budget decisions.	1	2	3	4	5	6	7	
43	I develop performance measures to make my budget decisions.	1	2	3	4	5	6	7	
44	I review performance evaluations to make my budget decisions.	1	2	3	4	5	6	7	
45	I use a completely self-supporting budget.	1	2	3	4	5	6	7	
46	I use a partially self-supporting budget.	1	2	3	4	5	6	7	
47	I divide the library budget into cost centers to track monetary inflows and outflows.	1	2	3	4	5	6	7	
48	By using cost centers, I identify and track fiscal accountability in the library.	1	2	3	4	5	6	7	
49	If library income is lost, I must cut expenditures to keep the budget balanced.	1	2	3	4	5	6	7	
50	The economic conditions surrounding my library are constantly changing.	1	2	3	4	5	6	7	
51	University mandates are a factor in my budgetary decision making.	1	2	3	4	5	6	7	
52	Institutions or bodies external to my university and library are factors in my budgetary decision making.	1	2	3	4	5	6	7	
53	Overall, I must acknowledge the importance of various internal or external conditions to the library environment when considering the allocation of my operating budget.	1	2	3	4	5	6	7	
54	To respond to internal/external conditions or pressures, my budgetary decision making must be flexible regardless of how I routinely craft my budget.	1	2	3	4	5	6	7	
55	To respond to internal/external conditions or pressures, my budgetary decision making	1	2	3	4	5	6	7	

	must be creative regardless of how I routinely craft my budget.									
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**SCALE**

**NEVER      1      2      3      4      5      6      7      ALWAYS**

**III. Instructions:** Please answer the following questions.

Code D5-24

56. Please select any of the following budgeting methods (if any) that you currently use to administer the general operating budget in your library.

- \_\_\_ a. Formula budgeting
- \_\_\_ b. Incremental budgeting
- \_\_\_ c. Performance/Incentive budgeting
- \_\_\_ d. Program budgeting
- \_\_\_ e. Responsibility or Cost Center budgeting
- \_\_\_ f. Zero-Based budgeting
- \_\_\_ g. Other/Hybrid/None Listed

(Specify: \_\_\_\_\_)

57. Are there particular internal or external conditions in your *university* that precipitate your use of the budget(s) selected in Question 56?

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60. Overall, why are you using the strategy(s) selected in question #56? (Select all that apply)

It meets our needs best

We inherited the strategy

We are under an administrative mandate that requires the use of the strategy

Additional comments on why you are using the strategy:

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61. Do you have plans to change your current budgeting strategy(s)? (Select all that apply)

No, our current strategy works

No, if we need to make modifications to our current strategy we will but we will not change to a completely new budgeting strategy

Yes, we are implementing short term plans to try a new budgeting strategy(s)

Yes, we are formulating long term plans to start using a new budgetary strategy(s)

We would like to change our strategy to one that better meets our needs but it is currently “under discussion” or “under review” (See question #62).

62. If you selected “we would like to change our strategy to one that better suits our needs but it is currently “under discussion” or “under review” in question #61, please comment on this process to include: the timeframe for this discussion or review, university or library administrator involvement or any other comments you would like to provide

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63. Who is responsible for the management of the library’s general operating budget? (Please select one response.)

- Director of Library
- Assistant Director of Library
- Academic Dean, Dean of Libraries
- University Librarian
- President/Vice President
- Provost
- Other/More than one job title (Who?  
\_\_\_\_\_)

64. What is your official title?

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**IV. Instructions:** Please complete all the questions *you care to answer*.

65. Please note your level of formal financial management training and/or preparation (select all that apply):

- On-the-job training
- Conference participation
- Extensive formal workshop
- Undergraduate degree
- Graduate degree

66. What is your gender?

- Male
- Female

67. Select your age category:

- Under 25
- 26-34

- \_\_\_ 35-44
- \_\_\_ 45-54
- \_\_\_ 55-64
- \_\_\_ Over 65

68. Select the number of years of your work experience in an administrative position.

- \_\_\_ Under 5
- \_\_\_ 6-10
- \_\_\_ 11-19
- \_\_\_ 20-24
- \_\_\_ 25-29
- \_\_\_ Over 30 years

**END**

**Thank you for completing this questionnaire.**

## Appendix D

### List of Institutions

American University  
Arizona State University Main  
Auburn University  
Boston College  
Boston University  
Brandeis University  
Brigham Young University  
Brown University  
California Institute of Technology  
Carnegie Mellon University  
Case Western Reserve University  
Catholic University of America, The  
City University of New York Graduate Center  
Claremont Graduate University  
Clemson University  
Colorado State University  
Columbia University in the City of New York  
Cornell University  
Duke University  
Emory University  
Florida International University  
Florida State University  
Fordham University  
George Washington University



Georgetown University  
Georgia Institute of Technology  
Georgia State University  
Harvard University  
Howard University  
Indiana University at Bloomington  
Iowa State University  
Johns Hopkins University  
Kansas State University  
Kent State University Main Campus  
Lehigh University  
Louisiana State University and Agricultural and Mechanical College  
Loyola University of Chicago  
Marquette University  
Massachusetts Institute of Technology  
Michigan State University  
Mississippi State University  
New Mexico State University Main Campus  
New York University  
North Carolina State University  
Northeastern University  
Northern Illinois University  
Northwestern University  
Ohio State University Main Campus, The  
Ohio University Main Campus  
Oklahoma State University Main Campus  
Old Dominion University

Oregon State University  
Pennsylvania State University- University Park  
Princeton University  
Purdue University Main Campus  
Rensselaer Polytechnic Institute  
Rice University  
Rutgers, The State University of New Jersey, New Brunswick Campus  
Saint Louis University  
Southern Illinois University at Carbondale  
Southern Methodist University  
Stanford University  
State University of New York at Albany  
State University of New York at Binghamton  
State University of New York at Buffalo  
State University of New York at Stony Brook  
Syracuse University  
Teachers College, Columbia University  
Temple University  
Texas A&M University  
Texas Tech University  
Tufts University  
Tulane University  
University of Alabama at Birmingham  
University of Alabama, The  
University of Arizona  
University of Arkansas Main Campus  
University of California-Berkeley

University of California-Davis  
University of California-Irvine  
University of California-Los Angeles  
University of California-Riverside  
University of California-San Diego  
University of California-Santa Barbara  
University of California-Santa Cruz  
University of Chicago  
University of Cincinnati Main Campus  
University of Colorado at Boulder  
University of Connecticut  
University of Delaware  
University of Denver  
University of Florida  
University of Georgia  
University of Hawaii at Manoa  
University of Houston  
University of Idaho  
University of Illinois at Chicago  
University of Illinois at Urbana-Champaign  
University of Iowa  
University of Kansas Main Campus  
University of Kentucky  
University of Louisville  
University of Maine  
University of Maryland Baltimore County  
University of Maryland College Park

University of Massachusetts  
University of Memphis, The  
University of Miami  
University of Michigan-Ann Arbor  
University of Minnesota-Twin Cities  
University of Mississippi  
University of Missouri - Columbia  
University of Nebraska - Lincoln  
University of Nevada, Reno  
University of New Hampshire  
University of New Mexico Main Campus  
University of North Carolina at Chapel Hill  
University of North Texas  
University of Notre Dame  
University of Oklahoma Norman Campus  
University of Oregon  
University of Pennsylvania  
University of Pittsburgh, Pittsburgh Campus  
University of Rhode Island  
University of Rochester  
University of South Carolina - Columbia  
University of South Florida  
University of Southern California  
University of Southern Mississippi  
University of Tennessee, Knoxville  
University of Texas at Arlington  
University of Texas at Austin

University of Toledo  
University of Utah  
University of Vermont  
University of Virginia  
University of Washington  
University of Wisconsin-Madison  
University of Wisconsin-Milwaukee  
University of Wyoming  
Utah State University  
Vanderbilt University  
Virginia Commonwealth University  
Virginia Polytechnic Institute and State University  
Washington State University  
Washington University  
Wayne State University  
West Virginia University  
Western Michigan University  
Yale University  
Yeshiva University