THE MULTI-CAMPUS SYSTEM'S ROLE IN MAINTAINING

INSTITUTIONAL DIVERSITY IN TEXAS,

PUBLIC UNIVERSITIES

by

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This work is dedicated to my father, Richard J. Lewis, Sr., who did not live to see me complete it. I think he would have been very proud.

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ABSTRACT

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Institutional diversity is a long-held value in U.S. higher education with origins dating back 300 years to pre-Revolutionary colonial colleges. Institutional diversity is still valued today, but Institutional theory predicts that institutional organizations, such as universities, will homogenize without intervention to prevent loss of diversity. Multi-campus systems should guard against homogenization as their primary function is to define the missions of constituent universities and ensure diversity throughout the system. Working under the assumptions of Institutional theory and the functional tenets of a multi-campus system, the purpose of this study was twofold; to determine if public universities in Texas were homogenizing with regard to institutional mission and to

explore the multi-campus systems' role in the condition of institutional diversity among constituent universities.

The objectives of the study were accomplished using a two-part mixed methods research approach that examined the time period from 1990 to 2010. In Part I, three hypotheses and regional competition were tested to determine the state of institutional diversity among Texas public universities. The variables representing the various aspects of a university's mission are program duplication rates; proportion of graduate programs out of total programs; research expenditures; first-time, freshmen admission rates; and the rate of first-time, freshmen applicants from the top 10% of their high school class.

Simple OLS analysis was used to examine Hypothesis 1 to determine if changes in the variables for each university were significantly correlated with time and if the universities were becoming more like one another. Hypothesis 2 examined whether non-research universities were homogenizing toward research universities. Hypothesis 3 examined whether membership in a multi-campus system reduced homogenization. A series of two proportions, two-tailed z-tests were used to test Hypotheses 2 and 3 by comparing the variables between the sub-groups of universities. After the comparisons were conducted, analysis entailed looking for patterns in the similarities and differences of the comparisons. Regional competition among universities in close geographic proximity was examined using simple OLS analysis where comparisons among universities were done on a regional basis within the Dallas-Fort Worth and Austin-San Antonio regions.

Part II of the study explored the multi-campus systems' role in promoting diversity among constituent universities through the examination of multi-campus systems' decisions and discussions recorded in the respective board of regent meeting minutes. A basic interpretive analysis was used to find explicit or implicit evidence that multi-campus systems were aware of their role in promoting institutional diversity as well as evidence that multi-campus systems were actively promoting institutions diversity among constituent universities.

Four key findings emerged from the analyses of the research hypotheses; regional competition; and the examination of the multi-campus systems' board of regent meeting minutes: 1) homogenization has occurred among the universities within this study; 2) non-research universities have not become like the research universities in this study; 3) multi-campus systems are not consistently preventing homogenization and in some cases are encouraging it; and 4) Institutional theory's isomorphic pressures do not adequately explain the homogenization observed in this study.

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CHAPTER 1

INTRODUCTION

1.1 Identification of the Problem

Institutional diversity is a distinguishing characteristic and ideological pillar of U.S. higher education (Trow 1979; Birnbaum 1983). Institutional diversity has been valued since the inception of higher education in the colonies 300 years ago and is reflected in the original nine colleges established prior to the American Revolution. Trow (1979) notes that while two colleges were sufficient to accommodate the higher education needs of the much more populous England during the seventeenth century, the American desire for institutions that represented the religious faiths of the settlers prevailed. Higher education in the colonies set the stage for institutional diversity.

Institutional diversity was likely facilitated inadvertently by the failed attempts to form a national, secular, post-graduate university (Trow 1979). George Washington and the five U.S. Presidents the followed him lobbied in support of a national university that they envisioned to be a premier institution in the heart of government, Washington D.C. President Washington fervently supported the effort to form the University of the United States and even made provisions for such in his will. He argued that a national university would unite the citizenry and would be able to attract the best faculty and provide top-tier programs by concentrating national resources. The University of the United States (what is now George Washington University) never formed as intended due to widespread objections including objections from those who felt its formation would infringe on states' rights (Trow 1979).

The failure to form a national university, which likely would have been a unifying and centralizing force, has allowed higher education in the U.S. to grow in all manner of form and function. Today there is still a desire for institutional diversity and a concern over institutional homogenization (Birnbaum 1983; Huisman and Morphew 1998; Morphew 1996; Morphew 2009), but there is only a small body of empirical work documenting whether or not homogenization is occurring and, taken in summation, that work is inconclusive. Further still, there is no work known to the author that empirically considers a university's membership in a multi-campus system as a mitigating factor in preventing homogenization, despite the multi-campus system being the overwhelmingly dominant organizational form for public colleges/universities.

In 1980, Stadtman suggested the increase in multi-campus systems may threaten diversity even though multi-campus systems should protect against such. Stadtman's prediction has yet to be examined until now. This research explored the impact of the multi-campus system form of organization on the long-held value of institutional diversity. Specifically, the research addressed the following questions:

1. Is institutional homogenization occurring among public institutions of higher education?

2. Does membership in a public, multi-campus system have an impact on institutional diversity?

1.2 Theoretical Frame of Reference

Individual university behavior is understood through an Institutional perspective, specifically the sociological flavor of New Institutionalism posited by DiMaggio and Powell (1983, 1991). DiMaggio and Powell's version of New Institutionalism explains how organizational practices become institutionalized (Scott 2001, 43) and, unlike other organizational analysis theoreticians who focus on organizational differences, DiMaggio and Powell focus on the vast similarities across organizations (1991, 9) and they identify the pressures that lead some types of organizations to homogenize. While this research is concerned with identifying whether or not homogenization is occurring among public universities in Texas regardless of the specific pressure, DiMaggio and Powell's theory will be presented in detail in Chapter 2.

1.3 Purpose of Study

Institutional theory predicts that institutional organizations will homogenize if there is no intervention to prevent the loss of diversity. The primary function of multi-campus systems is to determine the missions of their constituent institutions and to ensure diversity throughout the system. Working under the assumptions of institutional theory and under the functional tenets of a multi-campus system, the purpose of this study is twofold; to determine if public universities in Texas are homogenizing with regard to institutional mission and to explore the multi-campus systems' role in the condition of institutional diversity among their respective constituent universities. The objectives of the study were accomplished using a two-part mixed methods research approach that examined the time period from 1990 to 2010.

In order to determine the state of institutional diversity among Texas public universities, Part 1 of this study tested three hypotheses on a series of variables related to the three aspects of a university's mission and include program duplications; the proportion of graduate programs that make up a university's total number of programs; research expenditures; first-time, freshmen admission rates; and the rate of first-time freshmen applicants that graduated in the top 10% of high school class. The first hypothesis examined all the universities in the study to determine if they were becoming more like one another with regard to the variables just mentioned. The second and third hypotheses compared various sub-groups of institutions within the study to determine if the sub-groups were becoming more alike with regard to the same variables. The analysis of these hypotheses entailed looking for trends in homogenization or, conversely, differentiation, with special attention paid to the direction of any notable trends. Part I of this study also considered the role competition played among universities in close geographic proximity. The hypotheses and variables are described in detail in Chapter 4.

Part I of this study only addressed whether or not homogenization was occurring among public universities in Texas. Part II of this study, however, explored the multi-campus systems' role in increasing diversity or at least preventing the loss of diversity among its respective constituent universities. This was accomplished through the examination of the multi-campus systems' decisions and discussions recorded in the respective board of regent meeting minutes. Specifically, Part II of this research sought to answer the following questions:

1) Is there explicit or implicit evidence that multi-campus systems are aware of their role in promoting institutional diversity among constituent universities?
2) Is there explicit or implicit evidence that multi-campus systems are actively promoting institutional diversity among constituent universities?

Methods and procedures for Part II of this study are also described in Chapter 4.

1.4 Significance of the Study

This research is a contribution to the inconclusive and small body of literature on institutional diversity. However, what makes this work standout is its uniqueness in examining the multi-campus systems' role in influencing the condition of diversity among its respective constituent campuses. This research has global implications; as Dill and Teixeira (2000) note that renewed academic interest in institutional diversity appears to be linked to deregulation of higher education in Europe and Australia. Since the U.S. has the most diverse system of higher education throughout the world (Morphew 2002), it makes sense that the study of institutional diversity and mechanisms of diversity within U.S. institutions are of academic and policy interest abroad. In addition to augmenting the institutional diversity literature, this study begins to fill the gap in the institutional diversity literature that addresses the multi-campus system's role in maintaining institutional diversity or preventing institutional homogenization. This research is the first to do so and the first to attempt to answer Stadtman's 30-plus year old question.

1.5 Organization of the Dissertation

This dissertation is organized into six chapters, including this introductory chapter. Chapter 2 Background Information and Literature Review contains background information about the institutional diversity, multi-campus systems and the theoretical framework employed by the study. In addition, relevant literature is reviewed. More specifically, the chapter contains background information that defines and explains institutional diversity, presents the argument for the benefits of institutional diversity, and reviews the institutional diversity literature. The chapter also contains background information that defines and explains the multi-campus system organizational form, outlines the functions of a multi-campus system, and reviews the multi-campus system literature. The theoretical perspective is described and it use in this study is explained.

Chapter 3 Overview of Higher Education in Texas and Sample Description briefly describes the public university system in Texas and describes the sample of universities selected to be part of the study. Chapter 4 Methodology contains two parts: the first part describes and explains the empirical portion of the research that aimed to determine if Texas public universities were homogenizing. The second part describes and explains the qualitative portion of the study that aimed to determine the multi-campus systems' role promoting institutional diversity among its component universities. Chapter 5 Findings contains two parts as well. The first part describes and discusses the result of the analysis of the empirical portion of the study and the second part describes and discusses the qualitative portion of the study. Chapter 6 Conclusion discusses the study's key findings as well as the policy implication derived from the key findings and concludes with suggestion for future research.

CHAPTER 2

BACKGROUND INFORMATION, LITERATURE REVIEW AND THEORETICAL FRAME OF REFERENCE

2.1 Institutional Diversity

2.1.1 Internal Diversity versus External Diversity

Institutional diversity does not have a commonly accepted and operationalized definition in the higher education literature. Reference to institutional diversity within the higher education setting commonly brings to mind the ethnic/racial make-up of faculty, staff and students within the institution, but diversity has a much broader connotation. To mitigate confusion, diversity should first be distinguished in terms of internal and external diversity (Stadtman 1980; Birnbaum 1983). Internal diversity is, specifically, the "…differentiation of mission, programs, clienteles, instructional methodology or delivery system, structures, or other characteristics *within a single institution*" (emphasis in original) (Birnbaum 1983, 38). Stadtman (1980, 97) defines external diversity, typically referred to as institutional diversity, as "…a condition of having differences, and in higher education it characterizes any system in which individual institutions or groups of institutions differ from one another in any way."

Adding a research mission, expanding degree offerings to include graduate level programs, or expanding disciplinary areas are examples of increasing internal diversity. Often these changes to an institution's internal diversity are precipitated by political, social, economic or demographic factors. As individual institutions diversify within, the differences between institutions may diminish (Stadtman 1980; Birnbaum 1983). The potential negative correlation between internal and external diversity makes it imperative to distinguish between the two when conducting an analysis on the condition of diversity within higher education. This research focuses on the condition of *external* diversity among institutions. Further, institutional diversity will refer exclusively to external diversity within the context of this research.

2.1.2 Types of External Diversity

Institutional diversity can be categorized into several dimensions, including programmatic, procedural, systematic, constituential, reputational, and structural (Stadtman 1980; Birnbaum 1983). Programmatic diversity can be further broken into sub-dimensions that include degree level, degree area, comprehensiveness, mission and emphasis. Procedural diversity is concerned with delivery systems, student policies, and administrative policies. Systemic diversity includes the variables of institutional type, control and size. Constituential diversity refers to the characteristics of the students including background, abilities, preparation, goals, gender, ethnicity, and any other demographic attributes. Constituent diversity can also include the above elements for faculty and administration. Reputational diversity refers to the position of prominence the institution may hold within the whole of higher education. Finally, structural diversity considers two major issues: the legal authority outside of the board that influences the institution and whether the institution is under the control of their own board of if it is part of a multi-campus system with a single board (Birnbaum 1983). This study examined aspects of programmatic and constituential diversity.

2.1.3 Benefits of External Diversity

Several higher education scholars mention, or work under the assumption, that institutional diversity is beneficial and provides positive externalities (Morphew 2000a), but it is Birnbaum (1983) who provides a coherent and comprehensive explanation of institutional diversity benefits. His is the only deliberative and thorough consideration of the benefits of institutional diversity known to the author. For this reason, the current section is a summary of Birnbaum's explanatory discussion. His sources are cited when appropriate. Birnbaum's detailed explanation of the benefits of institutional diversity is outlined in three categories, 1) institutional, 2) societal, and 3) systemic. He created these categories for ease of explanation, but notes that factors under each may overlap with one another. Further, Birnbaum notes that institutional and societal arguments for diversity have been paid the most attention by scholars.

2.1.3.1 Institutional Benefits

Within the category of institutional benefits, Birnbaum includes meeting student needs, providing organizational and operational models, increasing institutional effectiveness, and protecting institutional autonomy and academic freedom. Diverse institutions can better meet the almost inexhaustible range of student needs (Clark and Youn 1976). Historically, student needs centered on religious affiliation (Birnbaum 1983), but the current range of student needs can include a preference for a small or large campus, a single sex environment, a specific racial/ethnic environment, a competitive environment, or vocational-technical environment (Astin 1977; Breneman and Finn 1978; Thompson 1978). Additionally, a range of diverse institutions can accommodate students with various levels of academic achievement.

A diverse range of institutions can also provide a laboratory type environment for decision-making, programming and organizational structure (Grant and Riesman 1978). Innovations within an institution can become a model (or a warning) for other institutions. Further, institutional diversity ensures that changes within one or a few institutions have minimal impact on institutions as a whole. If change creates failure, then the one or few institutions may come under hardship without all institutions falling into peril.

Diverse institutions allow for an increase in institutional effectiveness. Birnbaum explains that some functions that can exist within an institution do not work well together. He refers to these as non-complementary functions and offers the example of a liberal arts curriculum existing within a research university. Since it is difficult, and likely not feasible, to put equal resources into all functions, focusing on some functions and not others allows for the better achievement of the preferred functions (Cameron 1978).

The last institutional benefit, according to Birnbaum, is protection of institutional autonomy and academic freedom. Institutional diversity prevents the likelihood that all or most institutions within the higher education system will be faced with the same threats to autonomy and academic freedom. These threats can come from multiple sources such as political pressure from a state legislature, boosters, or a single big donor.

If institutions are funded and organized differentially, then one or some threats are not likely to affect all institutions.

2.1.3.2 Societal Benefits

Birnbaum's second category of institutional diversity benefits is societal benefits, which are benefits that extend beyond an institution's stated mission and include providing social mobility, serving the political needs of interest groups, allowing for both elite and mass higher education, and facilitating reform through competition. The benefit of social mobility is based in the generally accepted assumption that higher education provides opportunities to move between social classes (Birnbaum 1983). Social mobility is thus served through diverse institutions as they provide multiple entry points into academia (Ben-David 1972). If admission into an elite institution is not possible, other options are available; for instance, state college or local community college admission. Interestingly too, the same avenues of entry into academia that facilitate upward mobility also provide options to students who experience failure at any particular level of academia. Lastly, diverse institutions allow students to transfer within the system, especially between degree levels (Riesman 1975).

As mentioned previously, religious affiliation has been a source of diversity for institutions and, while a particular affiliation can meet student needs, it also meets the societal needs of training future ministers, keeping young people within the faith and converting others into the faith (Handlin and Handlin 1970). Jencks and Riesman (1968) argue that establishing a college gives the sponsoring group legitimacy within society. Riesman (1975) notes that establishing an institution to meet the needs of special interest groups allows the needs of the group in question to be met without invoking controversy within already established institutions that may or may not consider the needs of the group in question.

Another societal benefit that has an ideological overlap with the benefit of social mobility is the benefit of having both elite and mass higher education. Elite and mass higher education allows for the seemingly dichotomous values of quality and access to both be addressed (Clark 1981). Elite institutions, which typically have many resources and rigorous general education or liberal arts programs also, typically, have high admissions standards. Mass higher education institutions are often less selective and provide knowledge and skills that transfer to the labor market. In this way, quality and access can both be served. Trow (1979) has a different take on elite and mass higher education. He argues that elite and mass higher education is interdependent; that one would not exist without the other. A single system of elite higher education would not provide the needed services that are provided by mass higher education such as less selectivity, lower tuition, and labor market training. Mass higher education alone would be without academic models. Trow notes that neither system is impermeable and transfer of faculty and students between the two is common.

The last societal benefit according to Birnbaum is reform through competition. During most of the history of U.S. higher education, institutions have competed for monetary resources, faculty and students. Ben-David (1972) argues that this competition forced institutions to be innovative in order to attract faculty and students. Further, newer institutions that could not compete with the established and prestigious institutions created new programs that were distinctive. Ben-David (1972) gives the examples of Cornell offering practical and technical programs and Johns Hopkins emphasizing research and graduate programs in order to earn distinction.

2.1.3.3 System Benefit

Institutional diversity provides a responsive and stable higher education system (i.e. the sum of all higher education institutions in the U.S.). Birnbaum establishes that argument by first clarifying that the higher education system is indeed a loosely coupled, open system. He goes on to explain the benefits of a system by comparing the higher education system to a biological system with regard to selection and adaptation. The variety of institutions in the higher education system ensures that at least some institutions will be able to respond, through adaptation, to environmental pressures. Those institutions that are not nimble enough or too highly specialized may not be able to respond to environment pressures, but because of the diversity of the system, the system itself is able to maintain its integrity. Further, because of the loosely coupled nature of the system, it is less likely that a faltering institution will negatively impact other institutions. Thus, the responsiveness of the system is what ensures that the system remains intact and does not collapse. An important note is that not all institutions will survive as they succumb to environment pressures.

2.1.4 Research on External Diversity

A strong case for institutional diversity has been presented and scholars by and large agree that institutional diversity is worthwhile to maintain. Scholars do not agree; however, on whether diversity is diminishing, increasing, or simply remaining the same.

This lack of consensus on institutional diversity is the case for both critical and empirical analysis and the review that follows is organized by the type of analysis; critical or empirical.

2.1.4.1 Critical Analysis.

Riesman (1956, 1) is one of the first critical analysts to express concern over the loss of diversity among higher education institutions, which he refers to as "institutional homogenization." He argues that institutions tend to model themselves after more prestigious and successful institutions, thus reducing diversity among institutions. Riesman's argument becomes more developed in a joint publication with Jencks where the authors implicate faculty in increasing institutional homogenization through their rise to power (Jencks and Riesman 1968). The factors prompting faculty rise to power include professionalization, a merit-based system of rewards, and the increased importance of undergraduate education in the research university. These three factors, argue Jencks and Riesman, converge to form the model that other universities emulate and thus distinct institutions lose their special interests by conforming to the norms of the model.

Newman (1971) and the Carnegie Council on Policy Studies in Higher Education (1980) concur with Jencks and Riesman that institutional diversity is decreasing. Newman blames uniform trends and administrative patterns for the growing loss of institutional diversity. As an example, he explains that specialized institutions, such as teacher's colleges, are morphing into comprehensive colleges, becoming more diverse within the institution, but less diverse among institutions. Newman argues that this is evidence that institutions are accepting common institutional missions. The Carnegie Commission is also concerned that diversity is decreasing among institutions; thus, students are increasingly being educated in like environments. This, in turn, leads to fewer institutions with strong identities.

Trow (1979) and Stadtman (1980) are less emphatic in their claims that institutional diversity is decreasing, although both note that internal diversity appears to be increasing alongside the decrease of external diversity. Trow's study is notable as it considers sources of diversity, such as growth of educational programs, student services, students served, as well as organizational and governmental structures, which are factors not previously considered by other analysts. Stadtman (1980), while recognizing a decrease in external diversity, believes that it is offset by increases in internal diversity and is, therefore, no cause for alarm.

2.1.4.2 Empirical Analysis.

Empirical analysts, like the critical analysts, have not come to consensus on the condition of institutional diversity and this is likely for two major reasons, 1) the studies tend to exclude large portions of the higher education system, and 2) the lack of agreement on the variables used in the analyses. These factors make comparison of the data and generalizations difficult (Birnbaum 1983). The empirical research can be conceptualized in terms of its support on the condition of institutional diversity, whether the findings support the increase or maintenance of institutional diversity, the decrease of institutional diversity, or both the increase and decrease of institutional diversity.

Martin (1969), Gross and Grambsch (1968, 1974), and Baldridge (1978) find that institutional diversity is either remaining constant or increasing. Martin hypothesizes that different forms and functions of an institution including size, programs, sources of funding, and structural arrangements will result in diversity of educational goals, values and assumptions. His sample includes eight institutions and he uses campus visits and questionnaires of faculty, staff and students to gather data. His findings do not support his hypothesis as the institutions in his study produce similar outcomes in terms of educational goals, values and assumptions. In addition, Martin does not comment on whether institutional diversity is increasing or decreasing, but claims, regardless of his conclusions, that U.S. higher education is characterized by a great degree of diversity.

Gross and Grambsch's (1968, 1974) research is primarily concerned with institutional goals rather institutional diversity, but their findings do inform the institutional diversity literature. The researchers use survey data collected from 4500 people within 68 institutions to examine differences of goals among institutions with different characteristics. Their findings reveal that university goals differ greatly from those of other types of institutions and that the goals of universities differ from one another. Notably, they discover that there is further differentiation among goals from their first study to their second study (from 1968 to 1974), leading the researchers to conclude that institutional diversity is increasing and doing so rather quickly.

Baldridge (1978) examines differences in patterns of management and governance, institutional climate, professional autonomy, and other organizational characteristics based on institutional type. Eight institutional types are derived from the

Carnegie Council's classification systems of 1976. Survey data is collected from over 4000 people within 249 institutions. Baldridge finds a great deal of diversity among the institutions in their typology. Baldridge also asserts that diversity is increasing, but he does not anchor this claim in any comparative sense.

Hodgkinson (1971), Anderson (1977), Birnbaum (1983) and Morphew (2009) find through their research that institutional diversity is decreasing. Hodgkinson's work looks specifically at changes within institutions. He uses federal data from 1966 and compares it to other federal data that is 10 to 17 years older. He also uses questionnaire data completed by college/university presidents, which asks about changes in the institutions from 1958 to 1968. Hodgkinson concludes that institutions are becoming less diverse as they are increasingly offering advanced degrees, becoming large, co-educational, public and comprehensive. He attributes the shift in decreasing diversity to the fixation on the research institution as the model for higher education.

Anderson's (1977) study examines distinctiveness among private institutions. He uses data collected over a 10 year period of time that measures faculty and staff perception of the college environment in terms of scholarship, awareness, community, propriety, and practicality. The institution is given a distinctiveness score based on the average of the perceptions for the institution as a whole. Anderson finds that as the forty-five institutions in his study broadened their missions (i.e. became co-educational or secular) the perception of their distinctiveness decreases and the institutional score falls in line with national means.

Birnbaum's (1983) research is distinctive from other empirical research because of its comprehensiveness as it is the largest study of institutional diversity up to its publication. Birnbaum studies institutional change from 1960 to 1980, for all degree granting institutions within an eight state sample. He conducts his analysis by comparing the number of institutional types in existence in1960 to the number of institutional types in existence in 1980. He uses six variables to define and formulate a matrix of institutional types. The variables he uses are control, size, sex (single sex or co-education), program, degree level, and minority enrollment. Data from the National Center for Educational Statistics (NCES) is used to fill in the matrix. Birnbaum finds the number of institutional types remains about the same across the two decade period of his study, which would seem to indicate the amount of institutional diversity is stable. Birnbaum qualifies this finding; however, by pointing out that the two decades between 1960 and 1980 were a time of growth and expansion in higher education and although there are significantly more instructions in 1980 than in 1960, there is no increase in institutional diversity (143-144).

Morphew's (2009) research on institutional diversity builds on Birnbaum's, but goes beyond in scope by including all 50 U.S. states in the analysis. Morphew examines the three decades between 1972 and 2002. He uses most of Birnbaum's variables except for program and minority enrollment due to complications in the way the data had been collected through the years and differences in the definitions of the variables. Data from the Integrated Postsecondary Education Data System (IPEDS) is used in the analysis. Morphew's findings are similar to those of Birnbaum's in that institutional diversity did not increase; in fact, it decreases a bit even while there is growth in new institutional types. The new institutional types are not numerous enough to offset the number of distinctive institutional types of 1972 that either dissolve or become more like other institutions.

Pace's (1974) research combines aspects of Martin's (1969) research and Hodgkinson's (1971) research. Like Martin, he studies educational outcomes and like Hodgkinson, he studies changes in these outcomes through time. Specifically, Pace wants to know if college experiences differ based on institutional type and if the differences are greater in 1970 than they are in 1950. He uses a self-developed instrument to measure perceptions of the educational environment (Anderson's (1977) research, discussed previously, utilizes Pace's instrument). Pace finds, in contrast to Martin, that there are differences in educational outcomes among different institutional types. Additionally, he finds that diversity is increasing in some measures, but decreasing in others over time.

Much of research covered thus far is dated. The newer research, that which has been conducted within the last decade or so, seems to have abandoned the task of determining the condition of diversity among institutions of higher education and proceeded directly to discovering predictive models or correlates leading to diversity that can inform public policy (Dill and Teixeira 2000). Other recent research considers the factors that impact institutional diversity as well as theoretical perspectives through which to examine institutional diversity (and academic drift). Huisman and Morphew (1998) study the role of state and national policies that centralize governance of public higher education in order to create or maintain diversity. Dill and Teixeira (2000) suggest the use of economic theory to examine diversity and innovation in higher education.

The newer institutional diversity literature has also shifted focus to examining academic drift as a cause for a loss of diversity. Academic drift is "…the tendency of colleges and universities to ape the programmatic offerings of the most prestigious…" institutions (Morphew 2009, 246). Again, the newer literature has abandoned the task of determining the state of institutional diversity and proceeds under the assumption that diversity is, indeed, decreasing. Studies by Rhoades (1990), Jenniskens and Morphew (1999), Morphew (2000b) and Fairweather (2000) consider the faculty role in academic drift. Morphew and Huisman (2002) explore the use of institutional theory as an approach for explaining why academic drift occurs. A recent work by Morphew (2009) did look directly at whether diversity in higher education is being lost and he found that it was.

2.1.5 Summary of Institutional Diversity Background Information and Literature

Institutional diversity can refer to, among other things, internal diversity, which includes the differentiation of programs offered, clientele served, or the instructional methodology used within an institution (Birnbaum 1983, 38). External diversity refers to the differences among institutions (Stadtman 1980, 97). External diversity has many aspects and the two that are the focus of this study are programmatic and constituential external diversity. Maintaining a diverse higher education system has numerous benefits to the institutions, to society at large and to the higher education system itself. Although the numerous benefits of external diversity are well-documented and general consensus exists that institutional diversity should be maintained, the literature on the state of institutional diversity is inconclusive as to whether institutional diversity is being lost, increased or maintained. Part of this disparity is because some of the empirical evidence was discovered inadvertently through research that had other objectives. Other factors causing the disparity in the literature are that the studies tend to exclude large portions of the higher education system and the lack of agreement on the variables used in the analyses, making it difficult to comparison and generalize the data (Birnbaum 1983).

Despite the inconclusiveness of the literature, the more recent research pertaining to institutional diversity works under the assumption that institutional diversity is being lost. Missing from the older and newer literature on institutional diversity, however, is consideration of institutional diversity among public, four-year institutions in Texas. Missing too from the literature is consideration of the role the multi-campus system should play in promoting institutional diversity. This research endeavor attempted to respond to these gaps in the literature. Because multi-campus systems are an integral part of this research, it is important to understand what constitutes a multi-campus system, the pervasiveness of multi-campus systems, the functions of a multi-campus system, and the previous research on multi-campus systems. The next section will address these points.

2.2 Multi-campus Systems

Multi-campus systems begin to dot the organizational landscape of higher education as early as the turn of the twentieth century and their formulation continues through to World War I. Then, during the Great Depression, multi-campus system formation surges due to economic pressures (McGuinness 1991, 8). The greatest proliferation of multi-campus systems; however, occurs during the 1960s (McGuinness 1991, 8-9; Lee and Bowen 1971, 1). Today, multi-campus systems dominate the organizational landscape of higher education (Gade 1993). At least three quarters of those who are enrolled in public colleges and universities are students of institutions that are part of a multi-campus system (Gade 1993, 9).

Although multi-campus systems are quite pervasive, the literature on this type of organizational form is sparse and does not contain a single and agreed upon definition or description of a multi-campus system. Lee and Bowen (1971, 1), authors of one of the most well known and most comprehensive studies of multi-campus systems, offer a broad and encompassing description of a multi-campus system as a "…grouping of individual campuses under a common framework of governance." Under this descriptor, multi-campus systems can and do exist in many forms.

The great variety of multi-campus system forms is the result of numerous factors, including regional and temporal political and economic forces; a desire by state legislatures to control and direct the growth of higher education; and a need to expand educational opportunities into underserved regions. Some systems form as a consequence of institutional evolution. For instance, as normal schools become colleges and universities they no longer fell under the governance of state educational boards. These newly formed colleges and universities may have been clustered into a system under the governance of a board of trustees/regents (McGuinness 1991, 8; Johnstone 1999, 3). The Texas State System is representative of this example. Several scholars, including Cresswell et al. (1985), Magrath (1990), and McGuinness (1991), organize the various multi-campus systems into typologies to create order and to facilitate study of this organizational form. These typologies are described briefly to give a sense of the complexity found in the multi-campus system form of organization.

Creswell et al.'s (1985) typology is based on four organizational and administrative characteristics. The first characteristic is whether the system is under public or private control. The second characteristic bears upon the jurisdiction of the governing board. If the multi-campus system is statewide, it will be under the jurisdiction of a state-level governing board. If the multi-campus system is not statewide, it, and other multi-campus systems (if they exist) will be coordinated only at the state level, with each system having its own governing board. The third characteristic in Creswell et al.'s typology is the comparability of campuses within the multi-campus system. A heterogeneous multi-campus system would be comprised of institutions with different missions (Creswell et al. refers to this as institutional functions). For instance, a multi-campus system containing both doctoral granting institutions and community colleges could be considered a heterogeneous system. A homogeneous system would be one that contains like institutions. Creswell et al. keep this characteristic simply by restricting the typology to the dichotomy of either containing junior and senior level institutions or containing only junior or only senior level characteristic institutions. The fourth and final characteristic of Creswell et al.'s typology pertains to the administrative structure of the system and whether the system office is headed by the flagship chief executive officer or if it is headed by a separate entity with its own chief executive officer.

Magrath's (1990) typology is based on the types of institutions within the system, which are classified into three categories of systems that he refers to as university systems. Magrath's categories include the 1) flagship dominant university system, 2) small university system, and 3) large university system (2). The flagship dominant university system is, as it sounds, dominated by a flagship university that is typically well-established and large. Two or more smaller campuses are included in the system and these are branches of the flagship. A single system head administers the flagship as well as the branch campuses. The small university system is typically comprised of a few campuses and a single large campus. Each campus is administered independently by a chief executive officer. The large university system is typically a statewide system that consists of several campuses that are most often four-year institutions. The large university system is not necessarily characterized by a flagship institution. Like the small university system, each campus is governed by its own chief executive officer.

McGuinness' (1991, 1) typology is premised on the notion that there are two perspectives from which public multi-campus systems can and should be understood, 1) governance, and 2) coordination. These perspectives represent distinct functions. Governance, according to McGuinness and Paulson (1991, 2-3), is concerned with system and institutional operations, such as appointing the chief executive, planning, and policy implementation. Coordination is, according to McGuinness (1991, 5), "…the formal and informal approaches taken by states to draw together all the elements of the state's higher education systems and to handle the interconnections between the state and the higher education enterprise." Governance occurs within the framework of coordination and is impacted by the degree of authority that a particular state's type of coordination holds (McGuinness and Paulson 1991, 2).

According to McGuinness, states can be categorized into one of three types of coordination, 1) governing board states, 2) coordinating board states, and 3) planning, regulatory and/or service agency states. In states with governing boards, most or all of the public institutions are under a multi-campus system board (McGuinness 1991). This board has the dual responsibility of coordination as well as governance. Coordinating boards are the entity between the system board and the governor/legislature. These boards do not have governing authority except in specific and defined instances and the authority varies from coordinating board to coordinating board. Coordinating boards advocate on behalf of state interests and plan accordingly rather than that of individual institutions or systems. Coordinating boards are involved in appointing and compensating officers and staff of the system board(s), but they are not involved in chief executive of the system appointments and compensation nor faculty appointments or compensation. Coordinating boards do make budgetary recommendations and may create budgetary formulae, but they are not involved in appropriations. In states with planning agencies, coordinating functions vary, but are greatly minimized compared to states with coordinating boards.

McGuinness (1991) categorizes the governing arrangements of multi-campus systems into three structures, 1) academically integrated multi-site institutions, 2) multi-campus universities, and 3) multi-campus or consolidated governance systems. An academically integrated multi-site institution refers to a system where there are branch campuses or extensions of a main campus. The policies and programs of the branch campuses are extensions of the main campus. The branch campuses may or may not have their own chief executive. McGuinness describes this as having the feel of a single institution in various locations. A multi-campus university is a system in which there is typically a research university and other four-year institutions. The institutions within this type of system have their own missions, faculty and chief executive officers, none of whom are simultaneously the head of the system. The system head and staff are considered the academic leaders of the system.

Multi-campus or consolidated governance systems share characteristics with multi-campus universities, but can be distinguished in three distinct ways. Before embarking on those distinctions, it is important to note that multi-campus or consolidated governance systems can be further divided into two sub-categories, 1) segmental systems, and 2) consolidated systems. Segmental systems have boards that govern specific types of institutions. For instance, research universities would be governed by a board separate from the board that governs comprehensive colleges/universities. A consolidated system may govern both two and four-year institutions or may govern all four year institutions while another board governs all two year institutions.

Returning to the distinctions between multi-campus universities and multi-campus or consolidated governance systems, McGuinness (1991) refers to the distinctions in terms of the locus of academic leadership; the diversity of missions; and the origins of the system itself. The locus of academic leadership within the multi-campus or consolidated governance system is found at the campus level rather than at the system level as it is in multi-campus universities. The missions as well as degree of prestige among constituent campuses within a multi-campus or consolidated governance system have more variance than what is seen among institutions that are part of a multi-campus university. Finally, multi-campus or consolidated governance systems are often formed as a result of annexing stand-alone institutions or other systems, whereas multi-campus universities tend to form through the process of main campus branching.

McGuinness' (2003) formulation is an extensive series of models that illustrate the coordination and governance of postsecondary education within each state in the US. The models are based on the three major types of state level coordination previously discussed as well as the types of governance found among institutions within each state including notations of multi-campus systems. These formulations have resulted in a compilation of nineteen different models, some of which only represent the governance structure in a single state, while others are common to several states. Figure 1 is a sample of one of McGuinness' models and it also represents the coordination and governance structure for the state of Texas. In the case of Texas, the state-level coordination board is the Texas Higher Education Coordinating Board (THECB).

Delving into the many organizational patterns of multi-campus systems sheds light on why Lee and Bowen offer such a broad definition, but also highlights the need for a more nuanced definition to facilitate research on this organizational form. Johnstone's (1999, 3) definition is more specific and he describes public multi-campus

State-Level Coordinating Board, State Coordinating or Governing Board for Community Colleges, and Single-Institution and Multicampus Governing Boards

This structure is a complex system of institutional governance including some multi-campus systems with governing boards and some individual institutions with governing boards. The state-level board is responsible for coordinating the whole system. This structure is found in Alabama, Colorado, Illinois, Indiana, South Carolina and Texas.

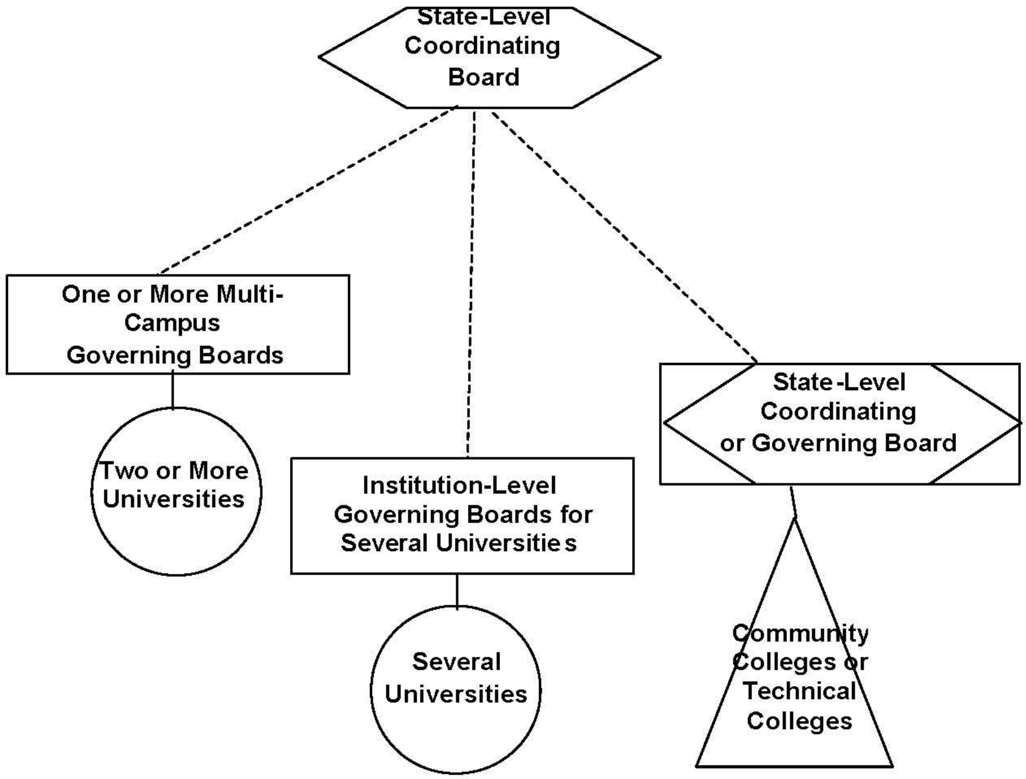

Figure 2.1 Model of postsecondary education coordination and governance in Texas, excerpted directly from McGuinness' (2003, 14) models of postsecondary education coordination and governance in the states.

systems as "… groups of public institutions, each with its own mission, academic and other programs, internal governing policies and procedures, and chief executive officer….". Johnstone's definition makes clear the distinction between what scholars refer to as multi-campus systems versus a multi-campus college/university. Multi-campus colleges/universities have branch or satellite campuses, but do not have unique missions and, in some cases, do not have their own chief executive officer. For the purposes of this study, the distinction between multi-campus systems and a multi-campus college/university is maintained and Johnstone's definition of a multi-campus system is utilized.

In Texas there are, by Johnstone's definition, five multi-campus systems (Texas A&M University System, Texas State University System, Texas Tech University System, University of North Texas System, and University of Texas System) and one multi-campus university (University of Houston System). In total there were 547,993 students enrolled in public universities in fall 2010 (includes multi-campus university institutions, multi-campus system institutions, and independent, public four-year institutions). Of that half of a million plus students, 82.3% (451,177) are enrolled in an institution that is part of a multi-campus system of the type that meets Johnstone's definition.[1] Given the pervasiveness of the multi-campus system form of organization nationally and in Texas, it is imperative to determine whether multi-campus systems are functioning as intended as this vital policy question impacts a substantial portion of the citizenry. The proceeding section establishes what the functions of the multi-campus system are to be.

2.2.1 Functions of the Multi-campus System

Given the pervasiveness of the multi-campus system, it is important to understand if this organizational form is effective. In order to make judgments as to the effectiveness of the organization form, it is necessary to understand what the functions of the system are supposed to be in order to evaluate whether a system is accountable for these

[1] Data retrieved from the Texas Higher Education Coordinating Board's Higher Education Accountability System, http://www.txhighereddata.org/Interactive/Accountability/default.cfm, accessed August, 24, 2011.

functions. Several scholars have noted the purpose/purposes of a multi-campus system. Lee and Bowen (1971) note at the time of their research that the rationale for a multi-campus system had not been stated explicitly by anyone, but that there is a set of assumptions regarding its rational. The first assumption, according to Lee and Bowen, is that multiple educational goals can be accomplished better through multiple multi-campus systems rather than by a single, state-wide system (9). The second assumption, according to Lee and Bowen, is that groups of institutions (i.e. multi-campus systems) can be better coordinated than a higher education system consisting of all autonomous campuses. These assumptions are of note because they speak to the primary functions of multi-campus systems, which are, in the words of Lee and Bowen, "…to promote specialization, diversity, and cooperation – a division of labor and alternative approaches to education in a coordinated, intercampus context" (9).

Donald Langenberg (1994) asserts that multi-campus systems provide benefits over stand-alone institutions. According to Langenberg, these benefits, which he describes as synergy, strategy, efficiency, accountability and integrity can and should be used to assess the effectiveness of the multi-campus system. Synergy refers to the ability of a system to combine resources in order to provide opportunities that may not otherwise be available through an independent institution. Strategy, according to Langenberg, is the process of "…setting common goals, assigning complementary roles to the constituent institutions, and coordinating tactics…" (8). The result of these strategic efforts is "…sharply focused missions in a system…" (9). Efficiency refers to combining services where possible in an effort to minimize duplication and the costs associated with duplication. Accountability refers to the system's ability to ensure the actions of individual institutions meet the state-wide, public needs. Integrity refers to the watchman function of a system, whereby the system ensures that individual institutions are accountable for their activities while also protecting the individual institutions from undue external intrusion ranging from the legislature to unwanted corporate attention.

Bruce Johnstone, former president of the National Association of System Heads, lists the nine essential functions of public, multi-campus systems (1999). He neatly orders these functions to reflect the degree to which they belong to the system, rather than to the individual institutions or state government, with function one being primarily the responsibility of the system and function nine being primarily the responsibility of the individual institution (11). The functions, quoted directly from Johnstone (1999, 11-17), are as follows:

1. To determine, reaffirm, and occasionally alter the mission of the system and its constituent campuses.
2. To appoint, nurture, evaluate, and if necessary, remove the chief executive officer (chancellor or president) of the system and of the constituent campuses or institutions.
3. To advocate to the legislature, governor and other key opinion leaders and patrons the needs of the system.
4. To advocate to the constituent campuses the needs of the state.
5. To allocate operating and capital resources and missions to the respective constituent institutions and missions.

6. To provide liaison between the executive and legislative offices of the state government and the member campuses.
7. To mediate disputes over programs and missions among constituent institutions.
8. To foster cooperation among campuses, which can both cut costs and enlarge options for students.
9. To audit and otherwise assess the stewardship of resources, including the assessment of academic programs.

A third of Johnstone's functions, including the top function as well as functions five and seven, are related to the management of the missions for constituent campuses within a system. Johnstone offers further explanation of each of these functions and, specifically, with regard to function one, notes that 'campus mission' refers to the educational direction of the institution, be it a teaching, comprehensive or research direction. Further, Johnstone indicates that institutional mission is what drives the amount and types of resources, the types of degree programs and the faculty reward system. Johnstone recognizes that the decision to make a comprehensive college into a research university is not a decision that can be made solely by a system board, but rather it is a decision that requires legislative/gubernatorial support; however, he makes the point that it is the system that encourages or discourages such pursuits and it is the purview of the system to prevent institutions from operating outside of their missions.

Function five addresses the allocation of monetary resources to support the missions of the multi-campus systems' constituent institutions. Johnstone explains that allocation of tax revenues is tied to tuition policy, which, as he says "will affect – or be affected by – the underlying allocation of tax resources" (15). Johnstone further explains that tuition rates are dependent on the socioeconomic capacity and selectivity of the students who attend the institution; therefore, a differential tuition policy that allows some campuses to charge more than another campuses is, as Johnstone agues, a policy decision that institutionalizes the practice of being able to spend more if the campus attracts students who are better academically prepared and who have higher socioeconomic status.

Function seven is related to addressing among constituent campuses. Johnstone indicates that there are three common types of disputes among constituent campuses; 1) those related to program duplication among constituent campuses, 2) those related to lower admission standards, which other campuses may see as an attempt to poach students who would have not been able to gain admission previously, and 3) those related to research drift, whereby a comprehensive college or university may increase its graduate programs, raise admission standards and raise its expectations for faculty research and productivity. It is, in part, one of the roles of a public multi-campus system to mediate such issues. How these disputes are mediated and resolved is essentially a policy decision. Each of these three functions relate back to the primary point of function one, which is that it is the system's responsibility to either prevent constituent institutions from operating outside of their respective missions or to make a conscientious and planned decision to refocus the mission of one or more of the constituent campuses.

While Johnstone provides a tidy and comprehensive list of multi-campus system functions, Joseph Kauffman (1980) provides a simple and yet powerful explanation as the raison d'être for multi-campus systems when he says "The justification of a system is planned, purposeful diversity to serve all the population better…" (72). Although Kauffman, Johnstone, and others are very clear as to the functions of a multi-campus system, relatively little research has been conducted on this organizational form. The subsequent section summarizes the research that has been conducted on multi-campus systems.

2.2.2 Previous Research on Multi-campus Systems

Much of the work on multi-campus systems can be put into two major groupings, those works that are descriptive case studies of a system and those works that focus on a particular operational issue, which is either descriptive and/or prescriptive with regard to how the issue is handled by one or more multi-campus systems (Gaither 1999). Some of the previous research is written from a practitioner perspective wherein the unique challenges of the multi-campus system form of organization is addressed using the practitioner's institution as the example. The California public higher education system has probably received the most scholarly attention. Smelser (1972) describes California's three layers of coordination, the university level, the state college level and the junior college level. Pickens (1999) describes the evolution of these three systems. Kerr (1994) shares his experience as president of the University of California system during the 1960s.

The State University of New York (SUNY) has also received notable attention from researchers. Gould (1972) describes the SUNY system, while Burke (1994), Chu (1994), Grenier (1994) and Chen (1994) delve into the system and campus roles of

SUNY. Some other multi-campus systems have also received scholarly attention. Hobby and Tiede (1999) describe the success of the University of Houston system, while Padron et al. (1999) and Thor et al. (1999) describe, respectively, the successes of the Miami-Dade Community College and the Maricopa Community College District.

Szutz (1999) and Middaugh (1999) study systems through the lens of a particular operational issue. Szutz (1999) examines how systems are using strategic planning to combat the challenges facing multi-campus systems. The Texas Higher Education System (i.e. community college governance at the Texas Higher Education Coordinating Board level) is one of the nine state university systems that is part of the his analysis. Middaugh (1999) studied whether multi-campus systems are characterized by instructional productivity. The author finds that national data on instructional productivity, which, according to Middaugh, mirrors that of state and system data, suggests that systems are very productive and that even research intensive institutions have classes taught by a majority of tenured and tenure-track faculty. The literature reviewed in the remainder of this section is described in more detail as the work speaks to how well systems function in one respect or another.

In 1971, Eugene Lee and Frank Bowen publish their landmark study of nine multi-campus systems, which they refer to as multi-campus universities. The authors note that theirs is an exploratory study and, indeed, it is in large part descriptive, but the authors conclude with an evaluation of strengths and weaknesses of the multi-campus system organizational form. Lee and Bowen use data that is collected through a series of interviews with both system level and campus level executives during the fall of 1968 and spring of 1969. The goal of these interviews is to collect information about the internal governance of a multi-campus university as it relates to educational and organizational issues that arise from the organizational structure. Of note, Lee and Bowen only interviewed faculty and staff from non-flagship institutions and they specifically mention that they interviewed faculty and staff from UT Arlington to gather data about the UT System (13). They exclude flagship campuses as these institutions typically have an over-represented influence on the system due their physical proximity as most system offices are located near the oldest university within the system and this proximity evolved most often because at some point the flagship and system office were often headed by the same chief executive (76). They describe their data in three dimensions, 1) the environment of governance, 2) the structures of governance, and 3) the process of governance.

The environment of governance dimension is a description of the social, economic and political context of the states wherein the systems are located as well as a description of the coordinating agencies and any relevant federal programs. The organization and history of each multi-campus system is also described. The structures of governance dimension describes the governing board, campus administration, and faculty government and student organization. Finally, the processes of governance dimension describes academic planning and programming, budget preparation and administration, personnel processes, admissions and transfer, external relations and business affairs. Lee and Bowen conclude with five strengths and six weaknesses of the multi-campus systems within their study (416-417). One of the strengths they discover, which is directly relevant to this research, is that the multi-campus systems in their study are able to maintain diverse missions among constituent campuses thus reducing and/or preventing program duplication. Lee and Bowen's study suggests that at least some multi-campus systems are accountable to their primary functions. This research endeavor was an attempt to systematically validate Lee and Bowen's observations.

Lee and Bowen conduct another study published in 1975 where they research the same nine multi-campus systems. This study is smaller in scale than the previous one as they only focus on academic affairs, budgeting, student admissions and transfers, and faculty staffing. The methodology is like that of the 1971 study, but due to time constraints, Lee and Bowen are only able to interview system heads and system staff and not campus executives and faculty. They conclude their research with a series of recommendations, premised upon the information they gathered through their interviews, on how multi-campus systems should move forward in the 1980s. Their recommendations fall into several categories including academic planning, academic program review, academic budgeting, strategies for program development, strategies for faculty and strategies for students.

Gade (1993) studies four successful multi-campus systems in order to determine which of their practices contribute to the stability, efficiency and excellence of the system. A successful system in this study is one that operates under a single governing board, has a long enough history to provide evidence of stability, and is known within and outside of their states to have a good system of governance (p. XI). The systems in the study also represent different regions of the nation and represent the various missions in higher education. The systems in Gade's study include the University of North Carolina, Kansas Board of Regents institutions, the University of California, and Maricopa Community College District. She gathers data through interviews with board trustees, campus and systems executives, and state policy makers. Five themes emerge throughout the interviews, 1) communication and culture, 2) centralization and decentralization, 3) coordination and control, 4) cooperation and competition, and 5) unnecessary program duplication. Gade's investigation culminates into sixteen best practices that she intends for other multi-campus systems to consider and perhaps adopt.

Burke (1999) studies 12 multi-campus systems in six states to determine how the systems respond to budget challenges from 1990 through 1997. He uses Langenberg's (1994) five objectives of synergy, strategy, efficiency, accountability, and integrity to assess system actions during this time. Burke collects his data through surveys that are sent to finance coordinators in the state coordinating or planning agencies, university systems, and comprehensive campuses and research universities. The survey questions are designed to elicit responses that shed light on whether the systems act in ways that are consistent with the objectives devised by Langenberg. Burke finds that in most cases, the systems do not act with a collective response to the budget challenges and thus, react inconsistently with Langenberg's objectives. Decentralization of tasks that could be and, arguably, should be under the purview of the system is a common reactionary pattern of the governance of the systems in this study (77). Burke's conclusion is of interest to this study because it suggests that multi-campus systems may not be accountable to their primary functions. This seems to contrast with Lee and Bowen's observations, but the two studies are considering two different aspects of system functions. This research considered, specifically, the multi-campus systems' role in promoting and preserving institutional diversity.

2.2.3 Summary of Multi-campus Systems Background Information and Literature

Multi-campus systems are a pervasive and distinguishing phenomenon of 20th century higher education. At least three-quarters of students enrolled in higher education are enrolled in a college or university that is a member of a multi-campus system (Gade 1993, 9). There are a great variety of systems and no agreed upon definition of a multi-campus system. This study uses Johnstone's definition of a multi-campus system, which consists of "… groups of public institutions, each with its own mission, academic and other programs, internal governing policies and procedures, and chief executive officer…." (1999, 3). Johnstone's definition makes clear the distinction between what scholars refer to as multi-campus systems versus a multi-campus college/university. Multi-campus colleges/universities have branch or satellite campuses, but do not have unique missions and, in some cases, do not have their own chief executive officer. This study also uses the functions of a multi-campus systems described by Johnstone (1999), the primary function being a duty to determine the missions of member universities.

Previous multi-campus system literature is mostly comprised of descriptive case studies of a particular system or studies that focus on a particular operational issue within a system, but the review revealed two conflicting works related to multi-campus system's responsibility for their functions. Lee and Bowen (1971) found the University of California System did maintain distinct missions among its member universities. Burke

(1999) found among the 12 multi-campus systems in the six states he studied from 1990 through 1997 that the systems were not accountable to their functions with regard to budgeting. This raises questions about whether systems are accountable to their other functions. This research endeavor sought to determine if public multi-campus systems in Texas are responsive to their primary function of defining constituent universities' missions in order to promote institutional diversity.

2.3 Theoretical Frame of Reference

Individual campus behavior is understood through an Institutional perspective, specifically the sociological flavor of New Institutionalism posited by DiMaggio and Powell (1983; Powell and DiMaggio 1991). DiMaggio and Powell's version of New Institutionalism explains how organizational practices become institutionalized (Scott 2001, 43) and unlike other organizational analysis theoreticians who focus on organizational differences, Powell and DiMaggio focus on the vast similarities across organizations (1991, 9) and they identify the pressures that lead some types of organizations to homogenize. While this research is concerned with identifying whether or not homogenization is occurring among public universities in Texas regardless of the specific pressure, Powell and DiMaggio's theory will be presented in detail. Before going further into explaining the pressures leading to institutional homogenization, some theoretical context for DiMaggio and Powell's theory is presented.

2.3.1 Theoretical Context

DiMaggio and Powell's theory is built on several theoretical assumptions (generated by other theoreticians). Some of these assumptions are more explicitly discussed in their foundational work while others are more implicit. The theoreticians set the tone for their hypothesis by using Weber's (1952) *The Protestant Ethic and the Spirit of Capitalism* as a conceptual starting point and argue that the reason for organization change in certain types of organizations is a shift away from Weber's rationalization and bureaucratization (DiMaggio and Powell 1983, 147). Specifically, they state that "…structural change in organizations seems less and less driven by competition or by the need for efficiency" (147). DiMaggio and Powell further argue that Weber's theory is inadequate for two reasons; one, adopting changes reaches a point of diminishing returns whereby selective advantages are no longer obtained, and two, not all organizations operate under easily understood technologies and easily measurable outputs and outcomes.

Easily understood technologies and easily measurable outputs and outcomes harkens back to Parsons (1960) view of an organization's relationship to its environment (Meyer and Rowan 1977; Scott 2001; Thompson 1967). Parsons puts organizational levels of responsibility into a vertical typology, which includes the technical, the managerial, and the institutional levels of responsibility. The technical level is focused on production activities (Parsons 1960; Scott 2001; Thompson 1967). The managerial level is focused on serving the technical level in two ways, one by acting as a mediator between the technical level and the customers, and two, by attaining the resources needed to perform the technical functions (Parsons 1960; Thompson 1967). The institutional level is focused on implementing the goals of the organization within the conventions of the larger community and society in which the organization exists (Parsons 1960; Scott 2001; Thompson 1967).

While all organizations may have technical, managerial or institutional level functions, one of these functions will often predominate (Thompson 1967). Meyer and Rowan (1977 354) explain that these levels can be imagined as a continuum and organizations can fall anywhere along the continuum based on their predominate function. A technical organization is one with easily understood technologies and easily measureable outputs and outcomes. Examples of technical organizations include manufacturing or farming, where the methods of production are well understood and shared throughout the industry. Their overall productivity can be easily quantified in their return on investment (Morphew and Huisman 2002, 495). Success for an organization with a dominate technical level function is judged through their efficiency (Meyer and Rowan 1977).

Institutional organizations, those that DiMaggio and Powell are concerned with, are, by contrast, characterized by ambiguous technologies and difficult to measure outputs and outcomes (Morphew and Huisman 2002, 495). Examples of institutional organizations include schools and universities, as their technology is pedagogy, which is highly varied and individualized. One could go as far as to say no two pedagogical approaches are the same. Further, the products of the educational industry are educated students. Defining and measuring what constitutes an educated student is still a matter of debate (Meyer and Rowan 1977, 354). Success for organizations with a dominate institutional function is judged, not by efficiency, which can be difficult to appraise, but by the organizations adherence to institutionalized rules, customs and practices (Meyer and Rowan 1977, 353-354). Adherence to institutionalized rules and practices provides the institutional organization legitimacy (Meyer and Rowan 1977, 353). The uncertainty in appraising the success of an institutional organization is a key component of organizational analysis addressed by DiMaggio and Powell, and, as will be seen, a recurring theme.

While DiMaggio and Powell are interested in how change affects institutional type of organizations, they are also focused on a specific level of analysis through which to view these organizations. Scott (2001, 83) notes that organizational research and analyses often differ based on the level of analysis upon which the researchers choose to focus and he identifies six potential levels of analysis ranging in scope from a macro level to a micro level, including world system, society, organizational field, organizational population, organization, and organizational subsystem. Scott notes that the distinctions are somewhat arbitrary and how they are made could vary in terms of time, space or numbers affected; however, the distinctions provide a useful exemplar for demonstrating the level of analysis used by DiMaggio and Powell, which is the organization field. DiMaggio and Powell (1983, 143) define an organizational field as…" those organizations that, in the aggregate, constitute a recognized area of institutional life: key suppliers, resource and product consumers, regulatory agencies, and other organizations that produce similar services or products."

Other researchers, including Meyer and Rowan (1977) have also done work at the organization field level, but a distinct and unique feature of DiMaggio and Powell's work is their application of Giddens' (1979) theory of structuration to organizational fields. Structuration is a recursive process whereby social structures are both created and constrained by social activities (Giddens 1979). Giddens refers to this as the "duality of social structure" and he further elaborates that social structures are "…the medium and the outcome of the practices they recursively organize" (25). Giddens defines structuration in a broad sense, but DiMaggio and Powell narrow the focus of the process as they apply it to organizational fields (Scott 2001, 142). They assert "…highly structured organizational fields provide a context in which individual efforts to deal rationally with uncertainty and constraint often lead, in the aggregate, to homogeneity in structure, culture, and output" (DiMaggio and Powell 1983, 147). To clarify further, it is the uncertainty that leads individual actors within an organization to make decisions that lead one organization in an organizational field to resemble the other organizations within the field. DiMaggio and Powell point out that it is these decisions that inhibit the organization to change further along in time (148). In sum, DiMaggio and Powell use structuration to explain how changes are diffused in an organizational field, especially organizational fields comprised of institutional organizations. Homogenization of organizations is precipitated by structuration of an organizational field and DiMaggio and Powell refer to this as isomorphism.

Isomorphism is a term derived from Hawley (1968) and DiMaggio and Powell (1983, 149) define it as "…a constraining process that forces one unit in a population to resemble other units that face the same set of environmental conditions." It should also be noted that DiMaggio and Powell recognize that there are two types of isomorphic change, competitive isomorphism and institutional isomorphism (1983, 149). Competitive isomorphism, as the name indicates, is prompted by competition (Hannan and Freeman 1977). This type of isomorphism is more likely to occur among technical types of organizations who compete for survival in the free-market (DiMaggio and Powell 1983, 150). Institutional isomorphism is prompted by structuration, which is more likely to occur among institutional organizations and results in legitimacy. As institutional organizations incorporate societally accepted practices into their operations their legitimacy increases and thus their organizational survival (Meyer and Rowan, 1977 352). With this theoretical context, we arrive at DiMaggio and Powell's proposal of three mechanisms of institutional isomorphic change that are elaborated in the following section.

2.3.2 DiMaggio and Powell's Institutional Isomorphic Mechanisms

DiMaggio and Powell propose that institutional isomorphic change can occur as the result of coercive, mimetic and/or normative pressures. These three mechanisms are not mutually exclusive, but they tend to arise for different reasons and they may produce different outcomes. Coercive isomorphism occurs as a result of either formal or informal demands placed on an organization from another organization for which it is dependent. These demands can come in the form of mandates or through perceived expectations. Examples of coercive pressures include government/quasi-government control, laws, and technical requirements (Morphew and Huisman 2002, 496). The Southern Association of Colleges and Schools, a quasi-governmental accreditor, exerts coercive pressures on colleges and schools. While there are several examples of the pressures, one in particular is to assess learning and operational outcomes and to use the assessment data to improvement programs and services. Failure to comply with these expectations can result in sanctions that, in extreme cases, can result in a college or university's students being unable to receive federal financial aid to attend the sanctioned institution. As a result of coercive pressures to conduct assessment, institutional effectiveness processes can be found in accredited colleges and universities.

Mimetic isomorphism, as the name indicates, is a process of mimicry. The driving force behind this mechanism is uncertainty, which derives from institutional organizations' ambiguous technologies (i.e. in the case of education, pedagogy) and outputs/outcomes (i.e. in the case of education, an 'educated' student). Given the challenges of ambiguous technologies and outputs/outcomes, colleges and universities will model themselves after other more successful or prestigious organizations' practices. This strategy has the advantage of being low-cost and less risky than creating a new solution (DiMaggio and Powell 1983, 151). Further, the mimicry can occur intentionally or unintentionally. DiMaggio and Powell note that intentional modeling may occur through adhering to professional guidelines or through the recommendations of consultants and that unintentional modeling can occur as a result of faculty/staff turnover (1983, 151). Mimetic pressures can also be observed with regard to assessment. As illustrated in the assessment example for coercive isomorphism, assessment practices are spread through mimicry. Each year there are several national and regional conferences sponsored by professional organizations that pertain, in part or on the whole, to assessment practices. Participants gather to exchange ideas and share best practices that can be taken back to their respective organizations.

Normative isomorphism results from professionalization (DiMaggio and Powell 1983, 152). Professionalization occurs in response to standards of practice that are diffused throughout organizations by way of formalized education and discipline-specific/trade organizations. For instance, on its website, the National Association of Student Personnel Administrators (NASPA) touts itself as…" the leading voice for student affairs administration, policy, and practice, and affirms the commitment of the student affairs profession to educating the whole student and integrating student life and learning."[2] NASPA's 11,000 plus members most surely are implementing with at least some uniformity the ideals and practices of the professional organization. James Madison University's (JMU) doctoral program in Assessment and Measurement provides another example of normative isomorphism. The program is relatively new (began in fall 1998) and the only of its kind in the U.S. and, according to JMU's website it offers instruction in meeting "the expanding accountability, quality assurance, and outcome assessment needs of the 21st century."[3] The programs graduates will, as the NASPA members do, spread best practices within the organizations in which they work. These are two of many examples of how professionalization spreads standards of practice throughout an organizational field.

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[2] National Association of Student Personnel Administrators, http://www.naspa.org/about/default.cfm, accessed on May, 5, 2011.
[3] James Madison University, (http://www.jmu.edu/assessment/JMUAssess/Overview.htm, accessed on May, 5, 2011.

2.3.3 Use of the Theoretical Frame of Reference

This research is premised upon the assumption that institutional organizations within an organizational field (in this case, four-year, public institutions of higher education, specifically those within multi-campus systems) will homogenize. Further, this research accepts that homogenization could occur through any of the three mechanisms proposed by DiMaggio and Powell (1983). Because institutional isomorphic change, specifically mimetic and normative isomorphism, is rooted in the need for legitimacy, this research will assume that constituent universities within a multi-campus system will strive to model themselves after the oldest and/or most successful campus, which is typically the flagship university. In the case of Texas, the two most successful public universities are the Texas A&M University and The University of Texas, both of which are the flagships of their respective multi-campus systems.

CHAPTER 3

OVERVIEW OF PUBLIC UNIVERSITES IN TEXAS AND SAMPLE DESCRIPTION

Public higher education in Texas is coordinated by the Texas Higher Education Coordinating Board (THECB). The THECB was created in 1965 by the Texas Legislature to coordinate the activities of the public higher education institutions (Connally 1965, 1-5). On its website, THECB states their current role, according to their mission statement, "is to work with the Legislature, Governor, governing boards, higher education institutions and other entities to … provide the people of Texas the widest access to higher education of the highest quality in the most efficient manner."[4] The responsibility, leadership and strategic direction of the institutions come from the individual governing boards. The governing boards may preside over an institution or a system of institutions.

Within the state of Texas there were, as of academic year 2009-2010, 35 public universities each with their own chief officer. Thirty-one of these institutions belonged to one of six public university systems. The remaining four institutions operated independently with their own governing board. The purpose of this chapter is twofold; to summarily describe the make-up of public universities in Texas and to describe the sample of institutions that were used in this study. The chapter is divided into two

[4] Texas Higher Education Coordinating Board mission statement, http://www.thecb.state.tx.us/index.cfm?objectid=590DB776-049E-7F1F-BA50A97E6E39169D, accessed October 27, 2012.

sections to accommodate these purposes, the first part describes the four, independent public universities as well as the university systems and their member institutions and the second part describes the sample of universities selected for this study.

3.1 Texas Public Universities Description

3.1.1 Independent Public Universities

As already indicated, there are four, independent public universities in Texas that operate under their own governing boards. The four universities are Midwestern State University (Midwestern), Stephen F. Austin State University (SFA), Texas Southern University (TX Southern), and Texas Woman's University (TWU). What follows are a few facts about each institution. Unless otherwise referenced, founding dates were sourced from the individual institutions' websites and enrollment figures were queried from the THECB's Higher Education Accountability System.

Midwestern was founded in 1922 (THECB 2011, 23) and enrollment as of fall 2009 was 6,042. According to its undergraduate catalog, Midwestern considers itself a liberal arts university. SFA was found in 1923 and enrollment as of fall 2009 was 12,694. TX Southern was founded in 1947 and enrollment as of fall 2009 was 9,394. TX Southern is one of two public, historically black universities in Texas. TWU was founded in 1901 and enrollment as of fall 2009 was 13,103. According to its website, TWU, as the name suggests, was formed to educate women. The institution began admitting men into certain programs in the 1970s and to all undergraduate programs in mid-1990s; the institutions still exists primarily to educate women.

3.1.2 University Systems and Member Institutions

Institutions that are members of a university system make up the bulk of Texas public institutions. Currently, there are six university systems, which include the Texas A&M System (TAMUS), the Texas State University System (TSUS), the Texas Tech University System (TTUS), the University of Houston System (UHS), the University of North Texas System (UNTS), and the University of Texas System (UTS). The remainder of this is section is divided by university system where the system itself and its constituent four-year universities are described in brief. Unless otherwise indicated, the information about the university systems and their member institutions was sourced from the university system websites and enrollment figures were queried from the THECB's Higher Education Accountability System.

3.1.2.1 Texas A&M University System

The Texas A&M University System (TAMU System) is comprised of eight four-year institutions, three upper level institutions, seven state agencies and a health sciences center that has numerous branches. One of the four year institutions is Texas A&M University (TAMU), one of the state's two research institutions. Prairie View A&M (PVAM), a constituent member of TAMUS, is the second of only two historically black universities within the state. TAMU and PVAM, both founded in 1876, formed the backbone of the system. However, TAMUS was not officially recognized by the Texas Legislature until 1948. Most of the universities that are part of the system joined many years after being established and after the Texas Legislature recognized the TAMUS. Besides TAMU and PVAM, only two other universities were formed by the TAMUS, Texas A&M University—San Antonio (formerly a branch campus of Texas A&M University Kingsville (TAMUK)) and Texas A&M University—Central Texas (formerly a branch campus of Tarleton). Table 3.1 contains a listing of the TAMUS universities as well as the year the university was established, the year the university joined the system and university enrollment as of fall 2009.

Table 3.1 TAMUS Member Universities

Institution	Year Established	Joined System	Fall 2009 Enrollment[1]
Prairie View A&M University	1876	1876	8,608
Tarleton State University	1893	1917	8,598
Texas A&M International University	1969	1989	6,419
Texas A&M University – Central Texas	2009	2009	2,188
Texas A&M University College Station (flagship)	1876	1876	48,702
Texas A&M University–Commerce	1889	1996	9,075
Texas A&M University–Corpus Christie	1971	1989	9,468
Texas A&M University–Kingsville	1923	1989	5,892
Texas A&M University–San Antonio	2009	2009	2,343
Texas A&M University–Texarkana	1971	1996	1,597
West Texas A&M University	1909	1990	7,769

Note: Year established and year joined system information obtained through the TAMUS website. Although TAMUS was not officially recognized by Texas Legislature until 1948, TAMU, PVAM, and Tarleton are considered the back bone of the system and so the dates listed under Joined System are significant.

[1] All enrollment numbers from THECB, Texas Higher Education Accountability System

3.1.2.2 Texas State University System

The Texas State University System (TSUS) is comprised of four universities, three colleges and one technical institute. TSUS, founded in 1911, claims to be the oldest higher education system in Texas and was originally established to manage the state's teacher colleges, then referred to as normal schools. In 1917, the Texas Legislature approved that all normal schools could become colleges. The normal schools evolved into colleges and some eventually evolved into universities. According to the TSUS website, both the West Texas State Normal College (now WTAMU) and the North Texas

State Normal School (now the University of North Texas (UNT)) were under the purview of the TSUS. However, the TSUS historical timeline does not include when these institutions left the system. Interesting too is that one of TSUS universities, Lamar University, was at one time the flagship of the Lamar University System, which was established in 1983. The Lamar University System was abolished a little over a decade later in 1995 and its constituent colleges and technology institute were re-incorporated back into TSUS. Table 3.2 contains a listing of the TSUS universities as well as the year the university was established, the year the university joined the system and university enrollment as of fall 2009.

Table 3.2 TSUS Member Universities

Institution	Year Established	Joined System	Fall 2009 Enrollment[1]
Lamar University	1923	1923	13,992
Sam Houston State University	1879	1911	16,715
Sul Ross State University	1917	1917	2,018
Texas State University (flagship)	1901	1911	30,803

Note: Year established and year joined system information obtained through the TSUS website.
[1] All enrollment numbers from THECB, Texas Higher Education Accountability System

3.1.2.3 Texas Tech University System

The Texas Tech University System (TTUS) is the second youngest university system in the state as it was recognized by the Texas Legislature in 1999 (*Texas Senate Bill* 1088 1999). The system consists of Texas Tech University (TTU), Angelo State University (Angelo) and the Texas Tech Health Sciences Center. TTU and the Health Sciences Center each have numerous branch campuses and academic centers. According to Angelo’s website, the university joined the system in 2007 after citizens petitioned the Texas Legislature during that same year to have the university moved from TSUS to

TTUS for the reasons of geographic proximity and potential collaborations between Angelo and the system flagship. Table 3.3 contains a listing of the TTU System universities as well as the year the university was established, the year the university joined the system and university enrollment as of fall 2009.

Table 3.3 TTUS Member Universities

Institution	Year Established	Joined System	Fall 2009 Enrollment[1]
Angelo State University	1928	2007	6,376
Texas Tech University (flagship)	1923	1999	30,097

Note: TTUS was not recognized by the Texas Legislature until 1999.

[1] All enrollment numbers from THECB, Texas Higher Education Accountability System

3.1.2.4 The University of Houston System

The University of Houston System (UHS) is comprised of four universities and five off-campus teaching centers located in various suburbs of Houston. The System was recognized by the Texas Legislature in 1977 after all of the four universities had already been established (*Texas House Bill* 188 1977). The UHS is unique from the other university systems in Texas because it is not a multi-campus system as defined previously in Chapter 2. The president of the system is also the chief officer of the system's flagship institutions, the University of Houston. Table 3.4 contains a listing of the UHS universities as well as the year the university was established, the year the university joined the system and university enrollment as of fall 2009.

3.1.2.5 University of North Texas System

The University of North Texas System (UNTS) currently consists of the University of North Texas (UNT), the University of North Texas – Dallas (UNTD), and the University of North Texas Health Sciences Center. UNTS was recognized by the

Table 3.4 UHS Member Universities

Institution	Year Established	Joined System	Fall 2009 Enrollment[1]
University of Houston (flagship)	1927	1977	37,000
University of Houston-Clear Lake	1974	1977	7,643
University of Houston-Downtown	1974	1977	12,742
University of Houston-Victoria	1973	1977	3,655

Note: UHS was not recognized by the Texas Legislature until 1977; all institutions originated within the system prior to recognition.
[1] All enrollment numbers from THECB, Texas Higher Education Accountability System

Texas Legislature in 2001 (Texas Education Agency, Chapter 105). Prior to the fall of 2010, UNTD was considered a branch campus of the flagship, UNT. UNTD became an independent institution in fall 2010. UNT was founded in 1890 and enrollment as of fall 2009 was 3,067.

3.1.2.6 The University of Texas System

The University of Texas System (UTS) consists of nine universities and six health institutions. The system's flagship, University of Texas at Austin (UT) is the second of two research universities within the state. UTS does not recognize a distinction between the founding of its flagship institution (The University of Texas (UT)) and UTS. The Texas Constitution in 1876 called for the formation of a university that was to be called the University of Texas and gave responsibility for the yet unformed institution to a Board of Regents. By 1883, UT was established. In 1913, the Texas Legislature formed Texas School of Mines and Metallurgy in El Paso (now The University of Texas at El Paso) and placed the institutions under the control the Board of Regents. UTS notes that this is evidence that the legislature always intended for UTS to be a state-wide system. The system grew by formulating new institutions and by other already established institutions joining the system. The University of Texas at Arlington (UTA) joined the

UTS in 1965 as a result of being transferred from the TAMU System. Table 3.5 contains a listing of the UT System universities as well as the year the university was established, the year the university joined the system and university enrollment as of fall 2009.

Table 3.5 UTS Member Universities

Institution	Year Established	Joined System	Fall 2009 Enrollment[1]
The University of Texas at Arlington	1895	1965	28,085
The University of Texas at Austin (flagship)	1883	1883	50,995
The University of Texas at Brownsville	1973	1991	6,743
The University of Texas at Dallas	1969	1969	15,783
The University of Texas at El Paso	1913	1919	20,977
The University of Texas of the Permian Basin	1969	1969	3,546
The University of Texas - Pan American	1927	1989	18,337
The University of Texas at Tyler	1971	1979	6,163
The University of Texas at San Antonio	1969	1969	28,955

Note: Year established and year joined system information obtained through the UTS website.
[1] All enrollment numbers from THECB, Texas Higher Education Accountability System

3.2 Sample Description

The intention of the study was to include the maximum number of the then 35 Texas public universities as possible; however, some universities had to be excluded. The four universities within the UH System were excluded because the UH System is not a multi-campus system. As indicated previously, only institutions within multi-campus systems that have unique chief executive officers will be included in this research. Since the shared leadership of the flagship university and the System office fall to the same chief executive, there is a possibility that the directions of the universities within the system could be biased in favor of the flagship.

Other institutions were excluded based on the size of their enrollments. Only institutions with enrollments greater than 5,000 as of academic year 2009-2010 were included in the study sample. The reason for their exclusion is the likely possibility that data from the institutions would skew the overall findings. Small enrollments are indicative of small institutions with limited resources. Because of these resource limitations, it is highly unlikely that these institutions would be able to mimic the most successful/research universities. This in turn would likely skew the data and overall findings (Morphew 1996). Six institutions were excluded on the basis of small enrollments and they are as follows: The University of Texas of the Permian Basin, Texas A&M University-Central Texas, Texas A&M University-San Antonio, Texas A&M University-Texarkana, and Sul Ross State University.

After the exclusions, a total of twenty-six institutions remained and were included in the study sample. As stated in Chapter 1, the study aims to test three hypotheses. Each hypothesis requires the institutions to be examined by three different units of analyses. Hypothesis 1 considered the individual institutions. Hypothesis 2 requires that the institutions be put into two groups; a group consisting of the research universities and a group consisting of the institutions other than the research universities. The research university group consisted of the University of Texas and Texas A&M University. The non-research group consisted of all the other institutions, 24 in total. Hypothesis 3 required that the institutions be placed into three groupings. The first group is the research group, which is the same as the research group for Hypothesis 2. The other two groups consisted of those institutions that are members of a multi-campus system and those institutions that are not members of a multi-campus system.

The non-system group obviously consisted of the four institutions that are not part of a multi-campus system; Midwestern State University, Stephen F. Austin State University, Texas Southern University, and Texas Woman's University. Two additional universities were also included in the non-system group, Texas Tech University and the University of North Texas. UNT was included in the non-system group because it was the only four-year university in the system during the course of the study time period. UNTD was not established as an independent institution until academic year 2010-2011, which is outside of the study time period. TTU was included in the non-system group even though Angelo State University is part of the TTU System and is a four-year university. Since Angelo was only recently added in 2007 to the TTU System it was decided that TTU would likely be unaffected or affected in an indiscernible way by the addition. TTU had operated for 17 of the 20 years of the study time period as the sole four-year university so it made the most sense to include it in the group of institutions that also did not operate among other four-year universities. Table 3.6 contains the universities, listed in alphabetical order, that were included in the study sample as well as the abbreviation of the institution name that is used throughout this report and sub-sample groups that each of the institutions were assigned for Hypotheses 2 and 3.

Table 3.6 Selected Universities Comprising Study Sample

Institution	University Abbreviation used in Study	Hypothesis 2 Sub-sample Grouping	Hypothesis 3 Sub-sample Grouping
Angelo State University	Angelo	Non-research	System
Lamar University	Lamar	Non-research	System
Midwestern State University	Midwestern	Non-research	Non-System
Prairie View A&M University	PVAM	Non-research	System

Table 3.6-- *Continued*

Sam Houston State University	SHSU	Non-research	System
Stephen F. Austin State University	SFA	Non-research	Non-System
Tarleton State University	Tarleton	Non-research	System
Texas A&M International University	TAMIU	Non-research	System
Texas A&M University College Station	TAMU	Research	Research
Texas A&M University–Commerce	TAMUCM	Non-research	System
Texas A&M University–Corpus Christie	TAMUCC	Non-research	System
Texas A&M University–Kingsville	TAMUK	Non-research	System
Texas Southern University	TX Southern	Non-research	Non-System
Texas State University	TX State	Non-research	System
Texas Tech University	TTU	Non-research	Non-System
Texas Woman's University	TWU	Non-research	Non-System
The University of Texas - Pan American	UTPA	Non-research	System
The University of Texas at Arlington	UTA	Non-research	System
The University of Texas at Austin	UT	Research	Research
The University of Texas at Brownsville	UTB	Non-research	System
The University of Texas at Dallas	UTD	Non-research	System
The University of Texas at El Paso	UTEP	Non-research	System
The University of Texas at San Antonio	UTSA	Non-research	System
The University of Texas at Tyler	UTT	Non-research	System
University of North Texas	UNT	Non-research	Non-System
West Texas A&M University	WTAMU	Non-research	System

CHAPTER 4

METHODOLOGY

This study was a mixed methods institutional analysis of homogenization among Texas public universities and consisted of an empirical examination of the degree of homogenization among the universities as well as a qualitative examination of the role of multi-campus systems in promoting and/or maintaining institutional diversity from 1990 to 2010. This study was conducted under the assumptions provided by DiMaggio and Powell's (1983) theory of institutional isomorphism, specifically, mimetic isomorphic change, which argues that institutional organizations, such as colleges/universities, will homogenize by emulating the practices of the most successful universities. This theoretical frame of reference guided the selection of the research hypotheses. This chapter contains two sections; the first section explains the research approach for the quantitative analysis and the second section explains the research approach for the qualitative analysis. The first section, explaining the quantitative approach, describes the research design including the research hypotheses, variables examined, data gathering procedures, and methods of analysis. The second section, explaining the qualitative approach, describes the research design including the research questions, procedures and method of analysis.

4.1 Part I: Quantitative Approach

4.1.1 Purpose of the Quantitative Portion and Research Hypotheses

Institutional theory predicts that institutional organizations will homogenize if there is no intervention to prevent the loss of diversity. The primary function of multi-campus systems is to determine the missions of their constituent institutions and to ensure diversity throughout the system. Working under the assumptions of institutional theory and under the functional tenets of a multi-campus system, the purpose of the empirical portion of this study was to determine if public universities in Texas are homogenizing with regard to institutional mission and to explore the multi-campus systems' role in the condition of institutional diversity among constituent universities. In order to determine the state of institutional diversity among Texas public universities, this study tested the following three hypotheses.

Hypothesis 1

Public universities in Texas will, through time, resemble one another with regard to:

a. Program Duplications;
b. Proportion of advanced degrees (master's and doctoral) offered;
c. Acceptance rate of first-time freshman applicants;
d. Rate of freshman applicants from top 10% of high school graduating class; and
e. Research expenditures per full-time or full-time equivalent, tenure or tenure-track (FT/FTE-T/TT) faculty member.

Hypothesis 2

Public universities in Texas, will, through time, resemble the two public research/flagship universities (i.e. The University of Texas and Texas A&M University) in regards to:

a. Duplicated programs;
b. Proportion of advanced degrees (master's and doctoral) offered;
c. Acceptance rate of first-time freshman applicants;
d. Rate of freshman applicants from top 10% of high school graduating class; and
e. Research expenditures per FT/FTE-T/TT faculty member.

Hypothesis 3

Public universities in Texas that are members of multi-campus university systems will, through time, resemble research/flagship universities less than non-members of multi-campus university system in regards to:

a. Duplicated programs;
b. Proportion of advanced degrees (master's and doctoral) offered;
c. Acceptance rate of first-time freshman applicants;
d. Rate of freshman applicants from top 10% of high school graduating class; and
e. Research expenditures per FT/FTE-T/TT faculty member.

The analysis of these hypotheses will entail looking for trends in homogenization and statistically significant differences in homogenization or, conversely, differentiation, with special attention being paid to the direction of any significant trends. Direction of trends refers to whether or not the universities are becoming more like each other and whether or not the research universities or becoming more or less like the research universities.

4.1.2 Variables

As discussed previously in Chapter 2, there is a lack of consensus about whether or not higher education institutions are homogenizing and this is in part due to a lack of agreement upon which variables to use to test questions of institutional homogenization. This study focused on the aspects of diversity related to institutional mission. The variables selected for analysis are those that represent the three aspects of what McGuinness (1991, 4) says defines a college or university mission; 1) degrees awarded, 2) programs offered, and 3) clientele served. Precedents within the literature exist for some of the variables used to operationalize the three aspects of mission that McGuinness identifies, but others are unique to this study. Those variables unique to this study were selected in part because data is available and it was in a consistent format that facilitates analysis.

The degrees awarded aspect of mission was operationalized through the proportion of master's and doctoral degrees offered out of total programs by a university. Hodgkinson (1971) used, among other variables, the number of advanced degrees offered as a measure of institutional diversity in his work. In his study, institutions that offered increasing numbers of advanced degrees were taken as evidence of institutional homogenization. Birnbaum (1983) also used degree level in his work on institutional diversity on the premise that a commitment to graduate education equals a loss of focus on undergraduate education. Subsequently, an increase in institutions that offer graduate programs results in a reduction in the number of institutions that are focused on undergraduate education.

Research activity, operationalized by research expenditures, was also used to represent degrees awarded aspect of institutional mission. While the connection is less direct than actually looking at the number of advanced degrees offered, it is closely tied to graduate education. It may also be an early indicator of future graduate programs. There is not a known precedent for the use of this variable in the literature and this study is the first (to the researcher's knowledge) to examine research expenditures for evidence of increasing institutional homogenization.

The programs offered aspect of mission was operationalized through degree program duplication among the institutions. There is precedent in the literature for using this variable to measure institutional homogenization. In a very broad sense, Birnbaum (1983) used program duplication. He looked at programming at the curricular level and sorted institutions by their primary curricular purpose (i.e. liberal arts programming; comprehensive programming; technical and professional programming; and teaching programs). However, this study utilized the precedent set by Morphew (1996), whereby the researcher used program duplication rates as a measure of institutional diversity in relation to state-wide governing boards. Morphew's method of determining program duplications and the calculation of program duplication rates is used in this study and described in the procedures section of this chapter.

The clientele served aspect of mission was operationalized through first-time, freshmen acceptance rates, which is a proxy for an institution's level of selectivity, and though the applicant rate of top 10% students, which is a proxy for the level of appeal that an institution has to the most academically prepared high school students. Neither has a known precedent in previous research. Other researchers have used variables that operationalize clientele served such as whether an institution is co-educational or single sex (Hodgkinson 1971; Birnbaum 1983) and minority enrollment (Birnbaum 1983). Neither of these options was perceived to be particularly useful or informative for this study. All public universities in Texas have been co-educational since prior to the time period under examination, including Texas Woman's University. Morphew (2009) duplicated and broadened Birnbaum's 1983 study and used almost all of Birnbaum's variables except for minority enrollment because of the complications associated with the changing definitions of the data and the way data had been collected. For these reasons, new variables were used in this study.

As mentioned, acceptance rates represent an institution's level of selectivity. Since the most successful institutions are generally perceived to be the more (or most) selective institutions, an increase in selectivity is seen as evidence that universities are mimicking the practices of the successful institutions (i.e. mimetic isomorphic change). Applicant acceptance data is consistent and available from 1998 to the present. Applicant rates of top 10% students is intended to represent an institution's appeal to the most prepared high schools students. Since the most successful institutions are generally perceived to attract the best and brightest students, then an increase in applications from top 10% applicants would indicate that the institutions is becoming more appealing to the most prepared students. This data is also consistent and available from 1998 to 2010.

4.1.3 Explanatory Variable

Regional competition between institutions was considered as an alternative to mimetic isomorphic change. Ben-David (1972) argues that institutions that are in competition with one another will be innovative in an attempt to set themselves apart from other institutions. Regional competition in this study was operationalized through selected universities' geographic proximity to other universities. The closer institutions are to one another, the more likely they are competing for the same students, faculty, community resources, and legitimacy; therefore, heterogeneity should be the greatest among institutions that are in closest proximity to one another. If this is found to be the case, the predictive use of mimetic isomorphic change may be called into question.

4.1.4 Procedures

4.1.4.1 Determining Program Duplications

A longitudinal program inventory was requested and obtained from the Texas Higher Education Coordinating Board (THECB). The inventory is publically available by request. The THECB program inventory contained all programs offered for each of the institutions within the study from 1990 to 2010. The inventory contained the following information about the programs:

1) The Classification of Instructional Programs (CIP) code;
2) Program name;
3) Degree level;

4) Degree name; and

5) Date when program began and date when program ended.

The CIP code is a taxonomic scheme for organizing fields of study devised by the National Center for Education Statistics (NCES)[5], the branch of the U.S. Department of Education that is responsible for collecting and analyzing data about education within the United States. CIP codes are used by all public higher education institutions in the U.S. and each program of study is assigned a CIP code. The CIP is an eight digit code typically written in the following format: xx.xxxx.xx. The first two digits identify the program area. The next four digits identify the program within the program area. The final two digits are local codes that are, according to the THECB website[6], used to specify the diversity of a program apart from other programs where the first six digits are the same. There are 60 program areas within the CIP taxonomy. Table 4.1 is an example of program area 54 for the History field of study.

Table 4.1 Example of CIP Code Taxonomic Scheme

54 .01	History
54 .0101 .00	History, General
54 .0102 .00	American History (United States)
54 .0103 .00	European History
54 .0104 .00	History and Philosophy of Science/Technology
54 .0105 .00	Public/Applied History
54 .0106 .00	Asian History
54 .0107 .00	Canadian History
54 .0108 .00	Military History
54 .0199 .01	Atlantic History
54 .0199 .02	U.S./Mexican History

5 NCES CIP code user site, http://nces.ed.gov/ipeds/cipcode/Default.aspx?y=55, accessed October 11, 2012.
6 THECB CIP code explanation, http://www.txhighereddata.org/Interactive/CIP/, accessed October 11, 2012.

Program name refers to what the institution calls the program. Different institutions may call programs that have the same CIP and same degree level by a different program name. For instance, in 2010, the University of North Texas (UNT) and Texas Tech University (TTU) had baccalaureate programs under the program area of Computer and Information Science and Support Services (CIP program are a code 11.xxxx.xx), Information Science/Studies (CIP code 11.0401.00). However, UNT called the program by the name of Information Science and TTU called the program by the name of Management Information Systems.

Degree level refers to whether the program is undergraduate or graduate and if graduate, whether the program is at the master's or doctoral level. Degree name refers to the specific degree that is offered within the degree level. For instance, at the baccalaureate level there are numerous degree names, such as Bachelor of Arts (B.A.), Bachelor of Science (B.S.) or Bachelor of Business Administration (B.B.A). Professional doctorates, such as Medical Doctorate (M.D.), Juris Doctorate (J.D.), Doctorate of Pharmacy (Pharm.D.), and Doctorate of Veterinary Medicine (D.V.M.) were excluded from the study. Only non-professional doctoral programs were included as these are the programs that could reasonably and practically be duplicated by other institutions.

To determine program duplications for each institution, the first step involved sorting the program inventory by CIP code. Then the programs within each CIP were sorted into tables where institution and degree name were matched to program name. A program was defined using three ordered decision factors, 1) CIP code, 2) program name, and 3) degree name. Sorting by CIP code was straight forward and objective; however, sorting by program name and degree name was more complicated and required that decision rules were established to ensure consistency in formulating the duplication counts. Figure 4.2 is an example of one of the smaller program CIP tables. Many program CIP tables were much larger with many more program names.

Table 4.2 Example of a Program CIP table

Program CIP = 01010100

Institution	Degree Name	Program Name: AGRIBUSINESS	AGRIBUSINESS AND MANAGERIAL ECONOMICS	AGRICULTURAL SYSTEMS MANAGEMENT	GENERAL BUSINESS-AGRICULTURE
		Count	Count	Count	Count
TAMU	BS	.	.	1	.
	MAB	1	.	.	.
	MAGR	.	.	1	.
	MS	.	.	1	.
	PHD	.	1	.	.
TTU	BS	1	.	.	.
	MAB	1	.	.	.
WTAMU	BS	1	.	.	.
	MBA	.	.	.	1

Count indicates the number of programs for each degree name-program name combination.

Program names that conveyed the same content were considered the same program. For instance a program called ‘General Psychology’ was considered the same as a program called ‘Psychology’. However, programs that were considered to be applied programs were distinguished from general or non-specific programs. So using the psychology example again, a program called ‘Applied Psychology’ was distinguished from ‘General Psychology’/’Psychology’. Programs that indicated a specific emphasis were distinguished from general programs. Using the example from Table 4.2, ‘Agribusiness’ was considered the same program as ‘General Business-Agriculture’, but was distinguished from ‘Agribusiness and Managerial Economics’ as well as from ‘Agricultural Systems Management’.

Once program names were sorted, degree name was used as the final factor to define a program. Each degree name was considered unique. For instance, at the bachelor level a B.A. was distinguished from a B.S. This decision was rule was carefully considered as arguably the differences between a B.A. and B.S. are likely to be minimal and possibly based on program requirements outside the major. However, degree names at the graduate level do typically connote differences in program. For instance, many would argue that there are distinct differences between and Ed.D. and Ph.D. To maintain decision consistency throughout the degree levels, all degree names were taken to indicate different programs. As indicated previously, graduate level professional programs were excluded from the study.

Returning to the example from Table 4.2 and using the decision rules, the three institutions offering programs under CIP code 01.0101.00 have between them a total of nine programs. TAMU had five programs and one of those was a duplication of a program offered at another institution. TAMU’s duplication was at the master’s level. TTU had two programs and those two programs are duplications of programs offered at another institution. One was duplicated at the bachelor level and the other was duplicated at the master’s level. WTAMU had two programs as well, but only one of those was duplicated at another institution and that was at the bachelor level. Table 4.3 is a copy of Table 4.2, but program duplications are noted to the right of degree name in italicized font.

Table 4.3 Example of Program CIP table with Duplicated Programs Notated

Program CIP = 01010100

Institution	Degree Name	Program Name: AGRIBUSINESS	AGRIBUSINESS AND MANAGERIAL ECONOMICS	AGRICULTURAL SYSTEMS MANAGEMENT	GENERAL BUSINESS-AGRICULTURE
		Count	Count	Count	Count
TAMU	BS	.	.	1	.
	MAB ***1 duplication***	1	.	.	.
	MAGR	.	.	1	.
	MS	.	.	1	.
	PHD	.	1	.	.
TTU	BS ***1 duplication***	1	.	.	.
	MAB ***1 duplication***	1	.	.	.
WTAMU	BS ***1 duplication***	1	.	.	.
	MBA	.	.	.	1

Count indicates the number of programs for each degree name-program name combination.

Duplications counts were tallied for each CIP code for each institution by degree level. These tallies were used to determine program duplication rates. For Hypothesis 1, duplications and duplication rates were examined on an institutional basis. The duplication rate for institution was determined by dividing the institution's duplicated program number by the institution's total program number. Four different program duplication rates were determined for each institution; 1) total program duplication rate,

2) bachelor level program duplication rate, 3) master's level program duplication rate, and 4) doctoral level program duplication rate. For Hypotheses II and III, duplication rates were determined for the comparative groups as defined in Chapter 3. To determine duplication rates for the groups, the institutions were sorted into the groups and then program duplications and program numbers were summed for all the institutions within their respective groups. Respective sums of program numbers were divided by sums of program duplications to obtain each group's program duplication rates. This too, was calculated for all program levels combined as well as for individual degree levels.

4.1.4.2 Procedures for Determining Graduate Level Program Proportions

Graduate level program counts were obtained from the same longitudinal program inventory used to determine program duplications. The total number of programs for each institution was mined from the inventory as well as the total number of master's programs and total number of doctoral programs (excluding professional doctorates). The proportion of master's programs was calculated from dividing the number of master's programs by the number of total programs. The same was done for doctoral programs. For the analysis of Hypotheses II and II, the total number of master's programs was summed for each of the comparative groups and then divided by the sum of total programs by the respective comparative group.

4.1.4.3 Procedures for Determining Research Expenditures per FT/FTE-T/TT Faculty Member

Research expenditure data was obtained from the annual Research Expenditures reports produced by the THECB. This data was collected from fiscal years 1990 through

2010. Research Expenditures reports from fiscal years 1995 to 2010 are available on the THECB website.[7] Research Expenditures reports for fiscal years 1990 to 1994 are only available in hard copy format (THECB Research Expenditures). Total research expenditures were used in the study which consisted of expenditures based on federal, state appropriated, institutionally controlled and private research and development sources of funding. To control for inflation, total research expenditures for each year beginning in 1991 were indexed to constant 1990 dollars using the Consumer Price Index available on the Bureau of Labor Statistics website.[8]

To allow for comparisons among institutions, the indexed research expenditures for each institution was averaged for each year based on the number of FT/FTE-T/TT faculty. Prior to fiscal year 1999, the Research Expenditures reports did not contain the number of FT/FTE-T/TT faculty. This information for fiscal years 1990 to 1998 was obtained from the Statistical Supplements from the Annual Reports of the THECB (THECB Statistical Supplements). Full-time equivalent faculty counts were listed by rank (assistant, associate and full professor) and these three figures were combined to formulate the total number of FT/FTE-T/TT faculty per institution. Beginning in fiscal year 1999, the number of FT/FTE-T/TT faculty was included in the Research Expenditures reports. For Hypotheses 2 and 3, institutional average research expenditures per FT/FTE-T/TT faculty were summed for each of the groups that were to be compared.

[7] THECB Research Expenditures Reports, http://www.thecb.state.tx.us/index.cfm?objectid=159202CF-EFD1-DAF1-D5223E3296107BB1, accessed October 11, 2012.
[8] Bureau of Labor Statistics, Consumer Price Index, http://www.bls.gov/cpi/, accessed October 11, 2012.

4.1.4.4 Procedures for Determining First-time Freshmen Acceptance Rates

First-time freshmen applicant data was obtained from the First-time Undergraduate Applicant, Acceptance and Enrollment Information reports produced by the THECB and available on the THECB website.[9] The data used for this study came from applicant data from 1998-2010. Attempts were made to obtain applicant data prior to 1998 from the individual institutions, but only minimal and inconsistent information was available. Many institutions did not maintain data prior to 1998. Acceptance rate was calculated by dividing the number of applicants who were granted admission by the total number of applicants. Specifically, for Hypothesis 1, this was done on an individual institution basis. For Hypothesis 2, the institutions were sorted into two groups; the group of research institutions and the group of non-research institutions. The total number of applicants for all the institutions within each group was summed by group as were the total number of admitted applicants. Acceptance rates for each group were determined by dividing the summed total of accepted applicants by the summed total of applicants. The process was repeated for Hypothesis 3, but was done for the three comparative groupings, the research group, the system group and the non-system group.

4.1.4.5 Procedures for Determining Top 10% Acceptance Rates

Applicant numbers from students who graduated in the top 10% of their high school class was also obtained from the First-time Undergraduate Applicant, Acceptance and Enrollment Information reports produced by the THECB. The data used for this study came from applicant data from 1998-2010 as well. Attempts were also made to

[9] THECB First-time Undergraduate Applicant, Acceptance and Enrollment Information, http://www.txhighereddata.org/Interactive/AppAccEnr.cfm, accessed October 11, 2012.

obtain this data from the individual institutions prior to 1998, but these efforts were almost wholly unsuccessful as public universities have only been required to guarantee admission to top 10% applicants since 1998 (*Texas Top 10% Automatic Admissions Law* 1997). Top 10% applicant rate was calculated by dividing the number of top 10% applicants by the total number of applicants. Specifically, for Hypothesis 1, this was done on an individual institution basis. For Hypothesis 2, the institutions were sorted into two groups; the group of research institutions and the group of non-research institutions. The total number of applicants for all the institutions within each group was summed by group as were the total number of top 10% applicants. Top 10% applicant rates for each group were determined by dividing the summed total of top 10% applicants by the summed total of applicants. The process was repeated for Hypothesis 3, but was done for the three comparative groupings, the research group, the system group and the non-system group.

4.1.4.6 Procedures for Determining Areas of Regional Competition

Two metro areas containing universities that are part of this study lent themselves to testing regional competition; the Dallas-Fort Worth (DFW) region and the Austin-San Antonio (Austin-SA) region. Metropolitan Statistical Areas (MSA), as defined on the Texas Comptroller and Public Accounts website[10], were not used to determine the competition regions. Instead, the regions were defined according to reasonable driving distance from one another. In this case one hour was considered a reasonable driving distance. The universities within the DFW region include The University of Texas at

[10] Website of the Texas Comptroller of Public Accounts, http://www.window.state.tx.us/taxinfo/staxqtr/stxqtr_info.html accessed on October 10, 2012.

Dallas, The University of Texas at Arlington, Texas Woman's University, and the University of North Texas. The universities within the Austin-SA region include Texas State University and The University of Texas at San Antonio. The University of Texas is also contained with the Austin-SA region, but was excluded from the group as it is one of the two public research universities in the state and would most likely be distinguished from the other two institutions in the region.

4.1.5 Data Analysis

The purpose of this study was to address three primary questions:

1) Are Texas public universities homogenizing?
2) Are non-research institutions homogenizing towards research institutions?
3) Are universities that are members of a multi-campus system becoming less homogenous than universities that are not part of a multi-campus system?

Three hypotheses were formulated to address these questions. Each hypothesis tested the same variables, but did so through three different units of analysis. Hypothesis 1 was intended to determine if all the institutions in the study are becoming like one another. Hypothesis 2 was intended to determine if the non-research institutions within the study were homogenizing toward the research institutions. Hypothesis 3 was intended to determine if there being a member of a multi-campus system had an impact on reducing homogenization. Hypothesis 1 required a different type of analysis from Hypotheses 2 and 3. Hypothesis 1 methodology is described separately from that for Hypotheses 2 and 3.

4.1.5.1 Analysis for Hypothesis 1

Hypothesis 1 is as follow: Public universities in Texas will, through time, resemble one another with regard to:

a. Program Duplications;
b. Proportion of advanced degrees (master's and doctoral) offered;
c. Acceptance rate of first-time freshman applicants;
d. Rate of freshman applicants from top 10% of high school graduating class; and
e. Research expenditures per full-time or full-time equivalent, tenure or tenure-track (FT/FTE-T/TT) faculty member.

Each university in the study was examined individually for Hypothesis 1. Program duplication rates, graduate level program proportions, research expenditures per FT/FTE-T/TT faculty member, acceptance rates, and top 10% applicant rates were examined using descriptive and inferential statistics. The descriptive analysis entailed looking for patterns among programming, research expenditures, admissions selectivity, and the institutions' appeal to the most prepared graduating high school students.

Specifically, the inferential analysis examined the variables using simple OLS analysis to determine if changes in the variables were significantly correlated with time. The results of the descriptive and inferential analysis were compared across the universities to determine if the institutions were changing and if so, if they were changing in the same direction. Alpha level $< .05$ was considered statistically significant.

Because the program duplication data and the graduate level program proportion data is serially correlated, there were methodological concerns about using OLS for the analysis, namely over estimation of the significance of the model and coefficient. To alleviate some of the compounding effects of autocorrelated data, the decision was made to sub-sample the program duplication data and the graduate program proportion data. The sub-samples were taken at five year intervals beginning with 1990 and ending with 2010. This makes sense on a practical level as well since, programs enter and leave the institutions' program inventories relatively slowly. The program approval processes can take a year or more. The program removal process can take even longer, especially if students are still pursing the degree. Because of the predictability of slow program change, it was assumed that the program duplications rates observed during one of the five year intervals were correlated with programs existing in the five years prior to the observation and any changes between years would have be very small. However, issues of biasing the significance of the model and coefficients were of secondary concern as the purpose of using simple OLS analysis in this study was to identify trends rather than predict trends. For this reason, a simple statistical model was determined to be efficient.

To facilitate the analysis and comparison of descriptive and inferential data for the individual institutions as well as to provide additional context for interpreting findings, the institutions were organized into peer groups. These peer groups are the same as those used by the Texas Higher Education Coordinating Board (THECB) for accountability purposes when comparing institutions and setting benchmarks for performance. The THECB peer groupings include Research Universities, Emerging Research Universities, Doctoral Universities, Comprehensive Universities, and Master's Universities. A fully referenced description of the THECB peer groups is included in Chapter 5.

4.1.5.2 Analyses of Hypotheses 2 and 3

Hypothesis 2 is as follows: Public universities in Texas will, through time, resemble the two public research/flagship universities (i.e. The University of Texas and Texas A&M University) in regards to:

a. Duplicated programs;
b. Proportion of advanced degrees (master's and doctoral) offered;
c. Acceptance rate of first-time freshman applicants;
d. Rate of freshman applicants from top 10% of high school graduating class; and
e. Research expenditures per FT/FTE-T/TT faculty member.

Hypothesis 3 is as follows: Public universities in Texas that are members of multi-campus university systems will, through time, resemble research/flagship universities less than non-members of multi-campus university system in regards to:

a. Duplicated programs;
b. Proportion of advanced degrees (master's and doctoral) offered;
c. Acceptance rate of first-time freshman applicants;
d. Rate of freshman applicants from top 10% of high school graduating class; and
e. Research expenditures per FT/FTE-T/TT faculty member.

The analytical methods used to examine data for Hypotheses 2 and 3 were the same. The difference between the two hypotheses was the units of analysis. Hypothesis 2 compared the institutions that are considered research institutions to those that are considered non-research institutions. Hypothesis 3 was more complex as it required that three groups of universities be compared, which included the group of research universities, the group of universities that are members of a multi-campus system, and the universities that are not members of multi-campus systems. The system group was compared to the research group; the non-system group was compared to the research group; and the system group was compared to the non-system group. A full description of these groups is available in Chapter 3.

The comparisons between groups were done by using a series of two proportions, two-tailed z-tests. Z-tests were conducted comparing each year of data available for each variable. The two groups being compared were considered homogeneous when there was not a statistically significant difference between them for the given variable in the given year in question. Statistical significance was considered to be $p < .05$. Although each z-test was a test of the alternative hypothesis (i.e. a statistically significant difference between the two groups being compared), a single comparison for a single year was not adequate to evaluate whether the Hypotheses 2 and 3 could be accepted or rejected. This required the examination of all the years of data for each variable. So, after the comparisons were conducted, analysis entailed looking for patterns in the similarities and differences of the comparisons. The z-test model was selected because the sample, for all practical purposes is the population, thus the population variance of the sample is known.

Table 4.4 shows the scope of hypothesis testing that was conducted for Hypotheses 2 and 3.

Table 4.4 Hypotheses 2 and 3 Scope of Analysis

Variables Tested	Years of Data	Number of z-tests: Hypothesis 2	Number of z-tests: Hypothesis 3
Duplication Rate - all degree levels combined	5	5	15
Program duplication rate - bachelor level	5	5	15
Program duplication rate - master's level	5	5	15
Program duplication rate - doctoral level	5	5	15
Proportion of master's level programs	5	5	15
Proportion of doctoral level programs	5	5	15
Research expenditures per FT/FTE-T/TT faculty	21	21	63
First-time freshmen acceptance rates	13	13	39
Applicant rates of top 10% students	13	13	39

4.1.5.3 Analysis of the Explanatory Variable

Analysis of the explanatory variable, regional competition, utilized the same methodology as that used to examine Hypothesis 1, but comparisons among institutions were done on a regional basis. The universities with the DFW region were compared to one another and the universities within the Austin-SA region were compared to one another. If regional competition was in effect in these regions, it is expected that the universities within the regions would be distinct from one another.

4.2 Part II Qualitative Approach

4.2.1 Purpose of the Qualitative Portion and Research Questions

The second portion of this study was a basic interpretive qualitative study that involved the analysis of multi-campus system board of regents' meeting minute documents (Merriam and Associates 2002, 6). The purpose of this portion of the study was to obtain a depth of understanding of how multi-campus systems promoted institutional diversity. The analysis was inductive and explored discussions and decisions related to programming, research, and admissions/selectivity. Two primary questions were used to guide data collection:

1) Is there explicit or implicit evidence that multi-campus systems are aware of their role in promoting institutional diversity among constituent universities?
2) Is there explicit or implicit evidence that multi-campus systems are actively promoting institutional diversity among constituent universities?

4.2.2 Procedures

The meeting minutes, which spanned academic years 1990-1991 to 2009-2010 from three multi-campus systems, were examined, including those from Texas A&M University System (TAMUS), Texas State University System (TSUS), and the University of Texas System (UTS). Meeting minutes from the University of Houston System were not part of the analysis as the system does not meet the qualifications to be considered a multi-campus system as described in Chapter 2. Meeting minutes from the Texas Tech University System as well as the University of North Texas System were also not included in the analysis for two reasons, 1) neither system existed as a recognized university system for the whole duration of the study time period, and 2) neither system had component, four-year universities beyond the flagship for almost all of the study time period. An overview of the university systems is available in Chapter 3.

4.2.2.1 Texas A&M University System Board of Regent Meeting Minutes

The meeting minutes for the TAMUS board of regents are available on the system website from 1995 to the present.[11] The meeting minutes prior to 1995 were requested and obtained directly from the TAMUS office in electronic format. TAMUS minutes are for four different types of meetings; regular board meetings, workshop board meetings, special meetings and telephonic meetings. Workshop meetings were only conducted in 1993 and 1994. In total, minutes from 309 meetings were examined; 162 from regular meetings, six from workshop meetings, 57 from special meetings, and 84 from telephonic meetings.

Since almost all of the meetings had a table of contents, these were used to determine if a set of minutes contained relevant information. Virtually all of the special and telephonic meeting minutes were determined to be irrelevant as the meetings were typically called to make financial or personnel decisions. The regular meeting minutes were typically much longer and were organized according to their respective table of contents. The table of contents was used to identify specific areas that were to be examined for the purposes of this study, which included general remarks by the board chairman and system chancellor; report from the executive committee; report from the committee of academic and student affairs; and any additional items that were considered by the board.

[11] Texas A&M University System board of regent meeting minutes, 1995 to the present, http://www.tamus.edu/regents/minutes/, accessed October 10, 2012.

4.2.2.2 Texas State University System Board of Regents Meeting Minutes

The meeting minutes for the TSUS board of regents are available on the system website from 2009 to the present.[12] The meeting minutes for 2008 are in electronic format and those were obtained by request from the TSUS office. Meeting minutes prior to 2008 were only available in hard copy at the system office or any of the constituent institutions' main campuses. The meeting minutes from academic years 1990-1991 to most of academic year 2007-208 were reviewed on-site at the system office in Austin, Texas. Copies were made of the portion of the minutes that contained information relevant to this study.

TSUS board of regent meetings are of two types, scheduled quarterly meetings and special called meetings. For this study, minutes from 80 quarterly meetings were examined. Minutes from the special called meetings were also reviewed, but the total number of those meetings was not tallied when the data collection was done. However, there were five special called meetings during calendar year 2009 and seven for calendar year 2010 and this gives some indication of the volume of special called meetings during the study period.

Since all of the meeting minutes had a table of contents, these were used to determine items of relevance. The special called meetings, like with TAMUS, generally contained nothing of relevance as the meetings were typically called to make financial or personnel decisions. The regular meeting minutes were much longer and specific areas were examined for the purposes of this study, which included general remarks by the

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[12] Texas State University System board of regent meeting minutes, 2008 to the present, http://www.tsus.edu/leadership/regents/calendar-meetings.html , accessed October 10, 2012.

board chairman; discussion items; report from the curriculum committee; and miscellaneous and general items.

4.2.2.3 The University of Texas System Board of Regent Meeting Minutes

The meeting minutes for the UTS board of regents are available on the system website from 1881 to the present[13], but only those from academic years 1990-1991 to 2009-2010 were examined for this study. UTS meeting minutes are from two different types of meetings; regular board meetings and special called meetings. Beginning in 2002, committee meeting minutes began to be recorded and are also available on the system website. In total, minutes from 204 meetings were examined; 96 from regular meetings and 108 from special called meetings. Thirty sets of committee meeting minutes were also examined.

As is the case with TAMUS and TSUS, the meetings minutes have a table of contents that was used to determine items of relevance. The special called meetings, like with TAMUS and TSUS, generally contained nothing of relevance as they were typically called to make financial or personnel decisions. The regular meeting minutes were much longer and specific areas were examined for the purposes of this study, which included the executive session; special items; report from the executive committee; report from the academic affairs committee; and other matters.

4.2.3 Analysis

The relevant portions of the meeting minutes from each system were read thoroughly. Notes were made about discussions or decisions regarding undergraduate

[13] The University of Texas System board of regent meeting minutes, 1881 to the present, http://www.utsystem.edu/board-of-regents/meetings/meetings-archive, accessed October 10, 2012.

and graduate programming, research and admissions/selectivity. When discussions or decisions related to these areas were found, the following was documented for the following lines of inquiry were noted as applicable:

- What is the discussion or decision?
- Who is making the statements? An individual or an individual on behalf of a committee or university?
- To whom is the communication intended?
- What is the context of the discussion/decision?
- What is the intended effect of the communication?

The notes were then compiled and analyzed. Themes, patterns, and word/phase usages were noted and a description of the each system's board of regents' role in promoting institutional diversity was formulated. The final step in the analysis was to compare the qualitative findings to that of the quantitative findings in order to validate whether system action resulted in increased institutional diversity.

4.3 Summary

In summary, this study used a mixed methods approach to examine institutional diversity among Texas public universities. The quantitative portion of the study examined the degree of homogenization among the universities, while the qualitative portion of the study examined the role of multi-campus systems in promoting and maintaining institutional diversity among the universities. The research questions were derived from the assumptions of DiMaggio and Powell's theory of institutional isomorphism, specifically, mimetic isomorphic change. This chapter contains descriptions of the research designs for the quantitative and qualitative portions of the study. However, it does not contain a description of the sample used in the study. This information is described in the preceding chapter, Chapter 3. Since the sample description made more sense within the general context of higher education in Texas, the decision was made to provide an overview of Texas higher education and then subsequently describe the sample within a separate chapter. The following chapter, Chapter 5, presents the findings of the analysis.

CHAPTER 5

RESULTS

The purpose of this chapter is to present the results of the quantitative and qualitative analysis outlined in Chapter 3. This chapter is organized into two major sections; the first section contains the results for Part I, the quantitative portion of the analysis. The second section contains the results for Part II, the qualitative portion of the analysis. Part I section contains multiple subsections. The initial subsection of Part I contains descriptive and inferential data intended to contextualize the findings related to the research hypotheses. Following the initial subsection, are three subsections containing results for the three research hypotheses. The last subsection of Part I contains the results for the analysis for control variables intended to control for the impact of regional competition. The chapter concludes with a summary of the most meaningful findings.

5.1 Part I Quantitative Analysis Findings

5.1.1 Findings for All Universities as a Single Group

As already stated, this subsection of the chapter is intended to contextualize the findings related to the research hypotheses. The same variables used to test the research hypotheses were also used to examine all the institutions in the study as a single group. The variables include program duplication rates for all degree levels combined as well as individual degree levels; proportion of graduate programs (master's and doctoral);

research expenditures per full-time/full-time equivalent-tenure/tenure track (FT/FTE-T/TT); first-time freshman acceptance rates; and proportion of applications from students who were in the top 10% of their high school graduating class (applicant rate of top 10%).

5.1.1.1 Program Duplications

The program duplication rates for all degree levels combined as well as individual degree levels has been increasing by an average of .60% per year since 1990. In contrast, program numbers for all degree levels have been decreasing by an average of .46% per year since 1990. Bachelor level program duplication rates have increased by an average of .54% per year while program numbers have decreased by an average of .81% per year. Master's level program duplication rates have increased by an average of .56% per year while program numbers have decreased by an average of .02% per year. Doctoral level program duplication rates have increased by an average of 1.57% per year while program numbers have decreased by an average of .31% per year. The reduction in doctoral program numbers is unexpected since the number of institutions offering at least one doctoral program has increased 85% from 1990 to 2010. Only half of the 26 institutions offered doctoral programs in 1990, but by 2010, 24 of them offered doctoral programs. While the increase in the number of institutions offering doctoral programs is dramatic, it is also of superficial consequence, because many of the institutions that began offering doctoral programs after 1990 only have a handful of programs. Table 5.1 shows the total number of degree programs offered for all 26 universities as well as the total number of program duplications and the corresponding duplication rates.

Table 5.1 Program Numbers and Program Duplications for All Institutions

Year	1990	1995	2000	2005	2010	Average Annual Percent Change
Total Programs	4599	4268	4312	4189	4176	-0.46%
Total Duplications	2746	2627	2773	2687	2790	0.08%
Duplication Rate	60%	62%	64%	64%	67%	0.60%
Total Bachelors	2358	2086	2086	1965	1977	-0.81%
Total Bachelors (%)	51%	49%	48%	47%	47%	-0.38%
Bachelor Duplications	1546	1443	1463	1378	1435	-0.36%
Bachelor's Duplication Rate	66%	69%	70%	70%	73%	0.54%
Total Master's	1684	1679	1732	1697	1677	-0.02%
Total Master's (%)	37%	39%	40%	41%	40%	0.48%
Master's Duplications	969	984	1067	1037	1073	0.54%
Master's Duplication Rate	58%	59%	62%	61%	64%	0.56%
Total Doctoral	557	503	494	527	522	-0.31%
Total Doctoral (%)	12%	12%	11%	13%	13%	0.16%
Doctoral Duplications	229	200	243	272	282	1.16%
Doctoral Duplication Rate	41%	40%	49%	52%	54%	1.57%

Simple OLS analysis was used to examine program duplication rates. Prior to discussing the results of the analyses, it is imperative to acknowledge the limitations of the duplication rate data. Firstly, the analysis makes use of only five observations per individual degree level and for the program duplications for all levels combined. These observations were made at five year intervals beginning with 1990 and ending in 2010. Subsampling of the duplication rate data was done because the rates are serially correlated and because of the nature of program change in higher education. Programs enter and leave an institutions' program inventory relatively slowly. The program approval processes can take a year or more. The program removal process can take even longer, especially if students are still pursing the degree. For this reason, it is assumed that the program duplications rates observed during one of the five year intervals are correlated with programs existing in the five years prior to the observation and any changes between years would be very small. Subsampling the autocorrelated duplication data also makes sense from a methodological standpoint as it may improve the statistical model because it removes some of the compounding effects that occur and result in erroneously inflating the significance of the model and the coefficient. However, this is a secondary concern as the purpose of using simple OLS analysis in this study is identifying trends rather than predicting trends. For these reasons, a simple statistical model was determined to be efficient.

The OLS analysis reveals a deeper relationship between program duplication rates and the passage of time. When program duplication rates were examined in total, regardless of degree level, a statistically significant increase ($p < .05$) was found, which means the institutions' programs have become more homogeneous. Individual degree levels were also found to have a statistically significant increase in duplication rates over time (each level at $p < .05$). This indicates the increasing program duplications are found across program levels and not concentrated at any particular level. The descriptive and inferential analysis of duplication rates for all institutions combined as well as individual degree levels indicates the institutions are becoming more alike as they are offering increasing proportions of duplicated programs, which is contributing to a decrease in institutional diversity. The reduction in institutional diversity lends support to the tenets of mimetic isomorphic change. However, the rates of the changes are very small (all at less than .01%), so although programming is becoming more homogenous, it is doing so at a very slow pace. Significance may also be overstated given that there is a high degree of correlation among the duplication rates. Further, the analyses of individual institutions' duplications rates do not tell the same story as these preliminary findings. Much more variation among institutions exists than what is hinted here initially. Table 5.2 shows the details of the OLS analysis of program duplication proportions.

Table 5.2 Simple OLS Analysis Results for Program Duplication Proportions for All Institutions

Program Level	Constant	Coefficient (t statistic)	Adjusted R^2	F	Significance of Model
All Levels	-7.055	.004* (4.992)	.857	24.919	.015
Bachelor	-6.161	.003* (3.828)	.773	14.650	.031
Master's	-6.313	.003* (3.987)	.788	15.895	.028
Doctoral	-17.117	.009* (4.511)	.829	20.351	.020

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

5.1.1.2 Graduate Level Program Proportions

Graduate level programs, both master's and doctoral levels, as proportions of total programs have increased since 1990. Master's level program proportions increased by an average of .48% per year and doctoral level program proportions increased by an average of .16% per year. Table 5.3 shows master's and doctoral level program proportions as well as the average annual percent change in total programs and the proportions of both program levels. Simple OLS analysis was used to gain a deeper understanding of the relationship between graduate level program proportions and the passage of time.

Neither the proportion of master's level programs or doctoral levels programs are found to be significantly correlated with the time. The descriptive and inferential data indicate, as a single group, the institutions are not adding graduate programs to any sizable or significant extent. In terms of graduate program offerings, institutions are not becoming more like one another as they are already like one another and have been throughout the study time period. These findings are in contrast to the tenets of mimetic isomorphism, which would predict that institutions would offer increasingly more graduate programs in their process of adopting the practices of the most successful/research institutions. When individual institutions' graduate program proportions were examined, more nuanced results are found, but the individual results are largely consistent with these preliminary findings. Table 5.4 shows the details of the OLS analysis of graduate level program proportions.

Table 5.3 Graduate Level Program Proportions for All Institutions

Year	1990	1995	2000	2005	2010	Average Annual Percent Change
Total Programs	4599	4268	4312	4189	4176	-0.46%
Total Master's	1684	1679	1732	1697	1677	-0.02%
Proportion Master's	37%	39%	40%	41%	40%	0.48%
Total Doctoral	557	503	494	527	522	-0.31%
Proportion Doctoral	12%	12%	11%	13%	13%	0.16%

Table 5.4 Simple OLS Analysis Results for Graduate Level Program Proportions for All Institutions

Program Level	Constant	Coefficient (t statistic)	Adjusted R^2	F	Significance of Model
Masters	-2.906	.002 (2.480)	.563	6.150	.089
Doctoral	-.507	.0003 (1.067)	.034	1.139	.364

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

5.1.1.3 Research Expenditures

Research expenditures per FT/FTE-T/TT faculty member for institutions as a single group increased from $19,239 in fiscal year 1990 to inflation adjusted $46,278 for fiscal year 2010, an average increase of 6.7% per year.[14] Figure 5.1 is a graph of the research expenditures for each fiscal year from 1990 to 2010. Research expenditures were examined statistically using simple OLS analysis and are found to be increasing significantly ($p < .001$) across time.[15] The OLS findings also indicate that faculty spent an average of $1119 more each year. These findings are consistent with the tenets of mimetic isomorphism as the theory would predict that institutions would increase research productivity as research is a hallmark of successful/research institutions. These findings also largely represent what is found when individual institutions' research expenditures were examined. Table 5.5 shows the details for the OLS analysis of research expenditures.

[14] Research expenditures are total expenditures from local, state and federal sources of funding. The expenditures have been inflation adjusted to 1990 dollars. See Chapter 4 for a full description of how expenditures were determined.

[15] The Durbin-Watson test statistic derived from testing autocorrelation of the research expenditures was found to be inconclusive. To err on the side of caution, first differences were taken between the consecutive years of research expenditures and the differences were regressed against time. This was done in hopes of improving model fit over regressing the actual expenditures. The OLS analysis of first differences was found not to be any better of a model than regressing the actual research expenditures. In addition and as with the case of program duplication rates, since the regression data is being used to identify trends rather than predict them, the decision was made to proceed with the regression of actual research expenditures.

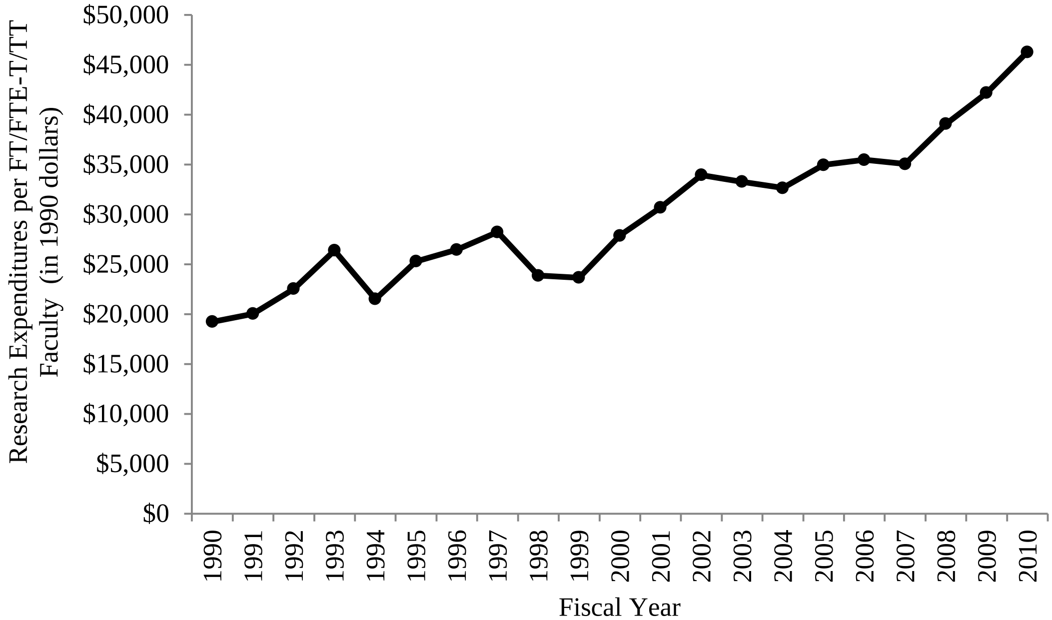

Figure 5.1 Research expenditures per FT/FTE-T/TT faculty member for all institutions

Table 5.5 Simple OLS Analysis Results of Research Expenditures for All Institutions

Variable	Constant	Coefficient (t statistic)	Adjusted R^2	F	Significance of Model
Research Expenditures per FT/FTE-T/TT Faculty	-2209399.187	1119.669*** (12.320)	.883	151.777	.000

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

5.1.1.4 First-time Freshman Acceptance Rates

Acceptance rates for first-time freshman decreased from 1998 to 2010[16] indicating that the institutions, as a single group, are becoming more selective. In 1998, 84% of applicants were accepted to the institution at which they applied, but 2010, only 72% of

[16] The time frame for acceptance rate data differs from that for duplication data and research expenditure data because reliable and consistent acceptance rates are available only from 1998 to the present. Attempts were made to obtain the data from the individual institutions prior to 1998, but these efforts resulted in inconsistent and piecemeal information. Several institutions did not maintain acceptance records prior to 1998. See Chapter 4 for a full description of the data and the source of the data.

applicants were accepted to the institution at which they applied, an average annual decrease of 1.2%. Figure 5.2 is a graph of the acceptance rates for each fall term from 1998 to 2010. The findings of the descriptive analysis are confirmed by the statistical analysis of acceptance rates using simple OLS analysis.[17] The acceptance rate for the group of institutions is found to be decreasing significantly ($p < .001$) over time. This finding is consistent with the tenets of mimetic isomorphism, which would predict increasing selectivity as institutions pursue the practices of the most successful/research institutions. However, the OLS findings also reveal that the rate of change is very small (less than .01%) and because the data is serially correlated, the significance may be overstated. The acceptance rate findings do largely represent the findings of the analyses of individual institutions' acceptance rates. Table 5.6 shows the details of the OLS analysis of first-time freshmen acceptance rate.

[17] The Durbin-Watson test statistic derived from testing autocorrelation of first-time freshmen acceptance rates was found to reject the null hypothesis. First differences were taken between the consecutive years of acceptance rates and the differences were regressed against time. This was done in hopes of improving model fit over regressing the actual acceptance rates. The OLS analysis of first differences was found not to be any better of a model than regressing the actual acceptance rates. In addition, like in the case of program duplication rates and research expenditures, the regression data is being used to identify trends rather than predict them, so the decision was made to proceed with the regression of actual acceptance rates.

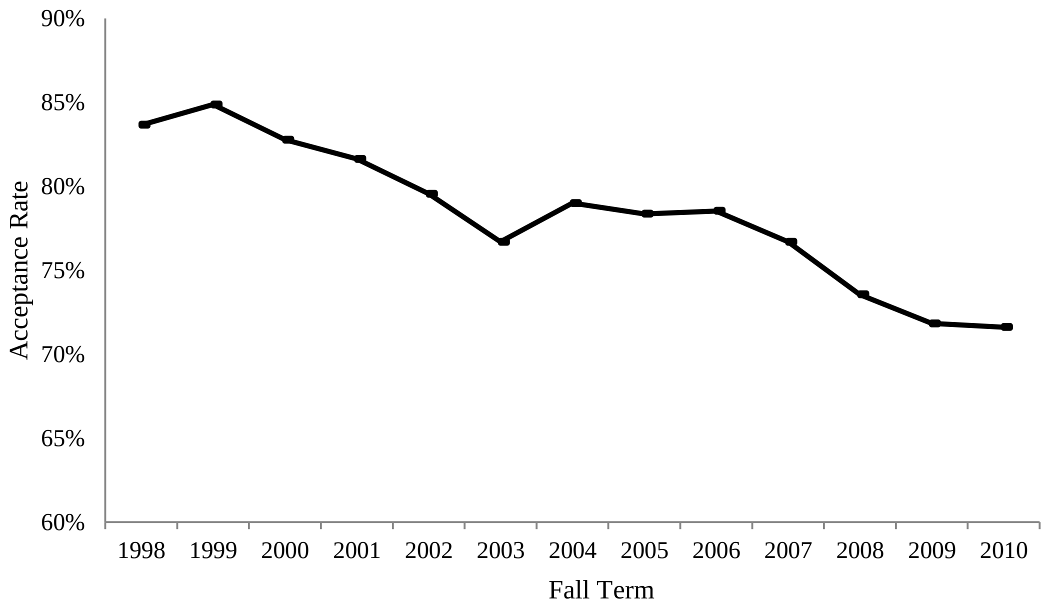

Figure 5.2 First-time freshmen acceptance rates for all institutions

Table 5.6 Simple OLS Analysis Results of First-time Freshmen Applicant Acceptance Rate for All Institutions

Variable	Constant	Coefficient (t statistic)	Adjusted R^2	F	Significance of Model
Selectivity	21.635	-.010*** (-9.942)	.891	98.838	.000

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

5.1.1.5 Applicant Rates of Top 10% Students

Applicant rates from students who were in the top 10% of their higher school graduating class increased from 1998 to 2010.[18] In 1998, 16% of total applications from first-time freshmen were from students who graduated in the top 10% of their high school

[18] The time frame for top 10% applicant rate data differs from that for duplication data and research expenditure data because reliable and consistent acceptant rates are available only from 1998 to the present. Attempts were made to obtain the data from the individual institutions prior to 1998, but these efforts were almost wholly unsuccessful as public universities have only been required to guarantee admission to top 10% applicants since 1998 (*Texas Top 10% Automatic Admissions Law*, House Bill 588, 1997). See Chapter 4 for a full description of the data and the source of the data.

graduating class. By 2010, 19% of total applications were from top 10% students, an average increase of 1.56% per year. Figure 5.3 is a graph of the application rate of top 10% students. The findings of the descriptive analysis are confirmed by the statistical analysis of top 10% application rates when analyzed using simple OLS.[19] The top 10% applicant rate is found to be increasing significantly ($p < .05$) over time. This finding is consistent with the tenets of mimetic isomorphism, which would predict that as an institutions gain prominence (i.e. like successful research institutions) they become more attractive to the most prepared high school students. The increase in the proportion of applications from these students is evidence that these institutions are becoming more attractive to the top students. However, the OLS findings also reveal that the rate of change is extremely small (.001%) and because the data is serially correlated, the significance may be overstated. The top 10% applicant rate preliminary findings only represent, at best, half of the findings when applicant rates of individual institutions were examined. Table 5.7 shows the proportion of first-time freshmen applicants from the top 10% of their high school graduating class.

[19] The Durbin-Watson test statistic derived from testing autocorrelation of applicant rates of top 10% students was found to reject the null hypothesis. First differences were taken between the consecutive years of top 10% applicant rates and the differences were regressed against time. This was done in hopes of improving model fit over regressing the actual applicant rates. The OLS analysis of first differences was found not to be any better of a model than regressing the actual applicant rates. In addition, like in the case of program duplication rates, research expenditures, and acceptance rates, the regression data is being used to identify trends rather than predict them, so the decision was made to proceed with the regression of actual applicant rates.

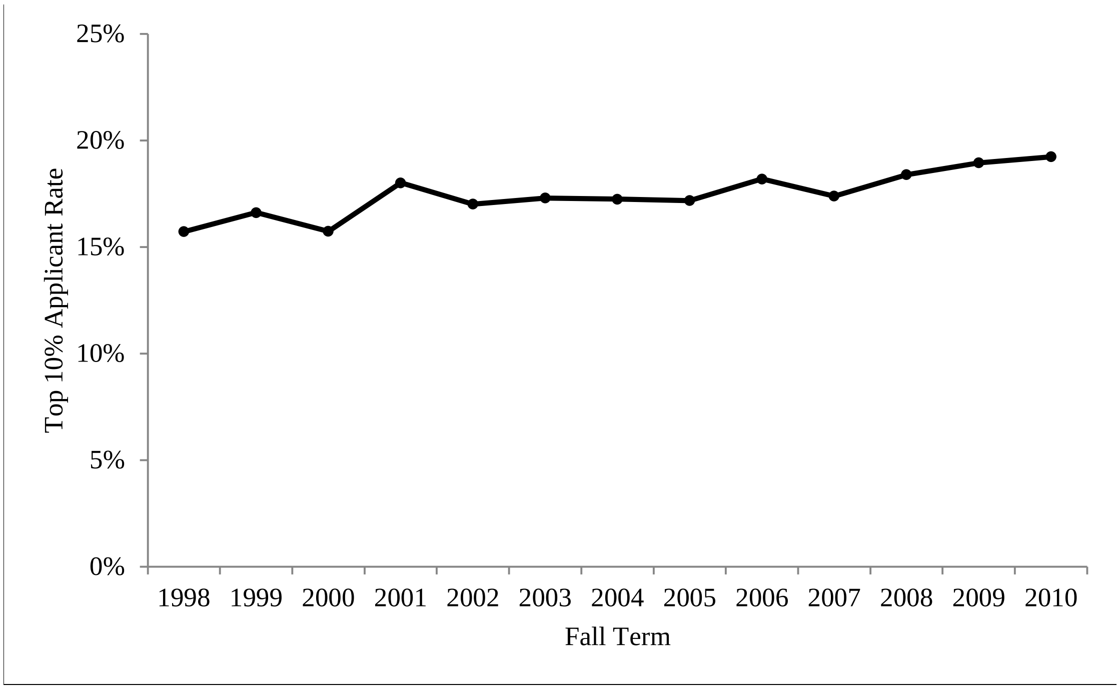

Figure 5.3 Applicant rate for student graduating in the top 10% of high school graduating class for all institutions

Table 5.7 Simple OLS Analysis Results for Top 10% Applicant for All Institutions

Variable	Constant	Coefficient (t statistic)	Adjusted R^2	F	Significance of Model
Top 10% Applicants	-2.795	.001* (3.041)	.407	9.248	.011

Note: * significant at < .05; ** significant at <.01; *** significant at <.001

5.1.1.6 Summary of Preliminary Findings for all Universities as a Single Group

Almost all of the variables examined are found to be statistically significant with the exceptions of master's and doctoral program proportions. Program duplication proportions are increasing significantly as the institutions are offering more programs that are also offered at other institutions. Research expenditures are increasing significantly as faculty become more oriented towards research productivity. First-time freshmen acceptance rates are decreasing significantly as institutions become more selective.

Applicant rates of top 10% students is increasing significantly as the institutions become more attractive to the most prepared high school students. Overall, the preliminary findings suggest that institutions are becoming more homogenous and moving in a direction consistent with the predictions of mimetic isomorphic change, even if the level of significance is overstated due to the nature of the time series data. Analysis of these variables at the individual institutional level provides a more detailed picture of how the institutions are changing that supports the preliminary findings in some cases, but refutes them in other cases.

The subsequent subsections present the results of the analyses of the research hypotheses. The analysis of the research hypotheses considered the same variables just presented, but each was examined within the context of different units of analysis (i.e. individual institutions and sub-groups of institutions). The purpose of Hypothesis 1 was to examine the institutions individually to determine if the institutions are becoming more alike in program duplications; graduate program proportions; research expenditures, acceptance rates; and applicant rates of top 10% students.

5.1.2 Findings for Hypothesis 1

Hypothesis 1 is as follows: Public universities in Texas will, through time, resemble one another with regard to:

a. Program Duplications;

b. Proportion of advanced degrees (master's and doctoral) offered;

c. Acceptance rate of first-time freshman applicants;

d. Rate of freshman applicants from top 10% of high school graduating class; and
e. Research expenditures per FT/FTE-T/TT faculty member.

Mimetic isomorphism predicts that institutions will become more homogenous as the institutions mimic the most successful institutions. So, there are two aspects of change that are addressed when considering the variables, one aspect is whether change is occurring and the other is the direction of the change. The direction of the change provides insight about whether or not the institutions are moving in a direction that is like that of the research institutions. To facilitate the analysis and comparison of individual institutions as well as to provide additional context for interpreting descriptive and inferential findings, the institutions were organized into peer groups. These peer groups are the same as those used by the Texas Higher Education Coordinating Board (THECB) for accountability purposes when comparing institutions and setting benchmarks for performance.

The THECB peer groupings include Research Universities, Emerging Research Universities, Doctoral Universities, Comprehensive Universities, and Master's Universities. These peer groupings, also referred to as institutional classifications, should not be confused with the Carnegie Classification of Institutions of Higher Education although both classification systems serve some similar purposes such as controlling for differences among institutions. The THECB peer groupings are based on similarity of "general academic mission and certain key academic indicators such as size and number of graduate programs, research expenditures, and other factors" (THECB n.d., 1). The

THECB intends for the institutional classifications to be fluid and indicates that classifications are to be reconsidered biennially. Institutions in this study are classified according to their respective classifications in 2010 (THECB 2011). These peer groupings are maintained throughout the presentation of Hypothesis 1 findings. Table 5.8 contains the institutional classification descriptions provided by the THECB (THECB n.d. 2-5).

Table 5.8 Institutional Classification Descriptions

Research Institutions
• Offers comprehensive range of excellent undergraduate, graduate programs and professional programs • Places greater emphasis on research and creative activities than universities in other institutional classifications and generates at least $150 million annually in research expenditures • Serves their regions, the state and beyond • Has higher proportion of students are enrolled in graduate and professional programs than universities in other institutional classifications • Awards 100 or more doctoral-research/scholarship degrees annually in excellent programs that span at least 15 disciplines
Emerging Research Universities
• Exists as educational, scientific, engineering, business and cultural resource centers committed • Has three-fold mission of teaching, research and service • Offers wide range of baccalaureate and master's programs • Offers graduate education through the doctorate in targeted areas of excellence • Serves a student population from within and outside the region • Directs academic efforts to applied and basic research in selected fields, teaching and scholarship, and creative activities • Encourages faculty members to be active researchers/creators in their respective disciplines and to involve both undergraduate and graduate students in research and creative pursuits. • Awards at least 20 doctoral-research/scholarship degrees per year, offers at least 10 doctoral-research/ scholarship programs, and/or enrolls at least 150 doctoral-research/scholarship students
Doctoral Universities
• Exists as educational and cultural resource institutions • Has three-fold mission of teaching, research and service • Offers a wide range of excellent baccalaureate and master's programs • Offers graduate education through the doctorate in targeted areas of excellence and/or regional need • Directs educational programs and academic efforts to both applied and basic research in selected fields, teaching and scholarship, and creative activities • Encourages faculty members to be active researchers in their respective disciplines and to involve both undergraduate and graduate students in research and creative pursuits. • Awards at least 10 doctoral-research/scholarship degrees per year, offers at least 5 doctoral-research/scholarship programs, and/or enrolls 150 doctoral-research/scholarship student • Generates research expenditures of at least $2 million per year

Table 5.8 - *Continued*

Comprehensive Universities
• Offers a wide range of excellent baccalaureate programs
• Offers graduate education through the master's degree
• Provides access to a broad range of excellent baccalaureate and master's programs
• Provides (possibly) doctoral-research/scholarship-level education in targeted area(s) of excellence and/or regional need (in most cases, this is in one or two areas, but may be as many as five)
• Provides excellent preparation not only for the workforce, but prepares students for professional schools and graduate education
• Focuses on serving the student population within the region
Master's Universities
• Concentrates on providing excellent broad-based undergraduate education
• Offers graduate education through the master's degree
• Establishes seamless transfer and facilitates success for Associate of Arts and Associate of Science graduates
• Offers smaller undergraduate class sizes
• Provides excellent developmental education and retention programs
• Provides access to critical and other excellent master's programs
• Provides excellent preparation not only for the workforce, but for professional schools and graduate education
• Has a critical role in the preparation of certified teachers
• Provides specialized programs recognized for their excellence

The descriptive and inferential results from the analysis of Hypothesis 1 are organized according the subsections of the statement, i.e. program duplications; proportion of graduate-level degrees; research expenditures; acceptance rate of freshman applicants; applicant rate of top 10% students. A summary of key findings follows each of these content areas as well as after the presentation of all the findings for Hypothesis 1.

5.1.2.1 Program Duplications

Four separate analyses were conducted on program duplications and duplication rates. The first analysis was conducted in order to examine all program duplications regardless of program level. The other three analyses were conducted to examine program duplications by degree level and included a baccalaureate-only analysis; a master's-only analysis; and a doctoral-only analysis.

5.1.2.1.1 All degree levels combined

Examination of all programs for each institution reveals that 61% of the institutions had an average annual percent increase in program duplication rates. The other 31% of institutions had an average annual percent decrease in duplication rates. The percent change in duplication rates resulted from one of four patterns of programming; 1) average annual percent increase in total program number and increase in duplicated program number, 2) average annual percent decrease in total program number and increase in duplicated program number, 3) average annual percent increase in total program number and decrease in program duplication number, and 4) average annual percent decrease in total program number and decrease in duplicated program number.

The first programming pattern resulted in nine institutions (35%) having an increase in their program duplication rates and four institutions (15%) having a decrease in their duplication rates. The second programming pattern resulted in three institutions (12%) having an increase in their duplication rates. The third programming pattern resulted in one institution (4%) having a decrease in its program duplication rate. Finally, the fourth programming pattern resulted in two institutions (8%) having a decrease in duplication rates. This demonstrates that it is possible, for instance, to have decreases in program numbers and program duplications an still have increases in the program duplication rate. This also demonstrates that all of the institutions are not behaving in the same way programmatically. Table 5.9 contains total program number, total program duplications and duplication rates for each institution. Table 5.10 contains the average annual percent change for total program number, total program duplications and duplication rates for each institution. Both tables are organized by institutional classification.

Table 5.9 Program Number, Duplicated Programs and Program Duplication Rates of All Degree Levels Combine for Each Institution

	Number of Programs (Number of Duplicated Programs) (Duplication Rate)				
Institution	1990	1995	2000	2005	2010
Research Universities					
TAMU	351 (167) (48%)	356 (167) (47%)	374 (192) (51%)	385 (190) (49%)	385 (203) (53%)
UT	411 (189) (46%)	429 (187) (44%)	428 (205) (48%)	451 (209) (46%)	457 (207) (45%)
Emerging Research Universities					
TTU	296 (178) (60%)	270 (179) (66%)	285 (191) (67%)	281 (180) (64%)	287 (199) (69%)
UNT	480 (225) (47%)	371 (183) (49%)	371 (195) (53%)	375 (189) (50%)	277 (180) (65%)
UTA	217 (138) (64%)	218 (157) (72%)	237 (161) (68%)	197 (143) (73%)	196 (149) (76%)
UTD	115 (48) (42%)	116 (52) (45%)	129 (51) (40%)	122 (64) (52%)	144 (81) (56%)
UTEP	166 (129) (78%)	175 (126) (72%)	174 (126) (72%)	184 (121) (66%)	193 (126) (65%)
UTSA	120 (74) (62%)	129 (91) (71%)	140 (100) (71%)	158 (110) (70%)	171 (121) (71%)
Doctoral Universities					
SHSU	208 (139) (67%)	166 (114) (69%)	172 (129) (75%)	148 (110) (74%)	149 (99) (66%)
TAMUCC	47 (41) (87%)	57 (44) (77%)	68 (54) (79%)	80 (69) (86%)	80 (67) (84%)
TAMUCM	304 (182) (60%)	248 (165) (67%)	249 (158) (63%)	194 (126) (65%)	186 (136) (73%)
TAMUK	145 (111) (77%)	129 (104) (81%)	114 (92) (81%)	111 (90) (81%)	109 (85) (78%)
TWU	314 (139) (44%)	269 (117) (43%)	226 (115) (51%)	159 (87) (55%)	153 (97) (63%)
TX Southern	147 (88) (60%)	93 (58) (62%)	88 (57) (65%)	85 (58) (68%)	86 (56) (65%)
TX State	206 (118) (57%)	185 (114) (62%)	195 (122) (63%)	204 (124) (61%)	211 (130) (62%)
Comprehensive Universities					
Lamar	152 (101) (66%)	137 (94) (69%)	117 (96) (82%)	121 (96) (79%)	125 (99) (79%)
PVAM	129 (103) (80%)	110 (79) (72%)	118 (85) (72%)	111 (77) (69%)	88 (70) (80%)
SFA	153 (92) (60%)	157 (102) (65%)	149 (109) (73%)	135 (90) (67%)	141 (101) (72%)
TAMIU	32 (27) (84%)	42 (29) (69%)	55 (44) (80%)	61 (50) (82%)	64 (47) (73%)
Tarleton	83 (55) (66%)	80 (52) (65%)	94 (67) (71%)	87 (62) (71%)	97 (74) (76%)
UTPA	82 (67) (82%)	89 (75) (84%)	102 (90) (88%)	104 (92) (88%)	109 (93) (85%)
WTAMU	177 (123) (69%)	176 (131) (74%)	142 (105) (74%)	136 (104) (76%)	136 (104) (76%)
Master's Universities					
Angelo	73 (58) (79%)	71 (58) (82%)	74 (61) (82%)	73 (60) (82%)	80 (64) (80%)
Midwestern	73 (59) (81%)	76 (63) (83%)	76 (60) (79%)	76 (62) (82%)	80 (66) (83%)
UTB	33 (28) (85%)	37 (29) (78%)	47 (40) (85%)	59 (51) (86%)	70 (56) (80%)
UTT	85 (65) (76%)	82 (57) (70%)	88 (68) (77%)	92 (73) (79%)	102 (80) (78%)

Table 5.10 Average Annual Percent Change in Program Number, Program Duplications and Duplication Rates for All Degree Levels Combined for Each Institution

Institution	Annual Average Percent Change: Program Number	Program Duplications	Duplication Rate
Research Universities			
TAMU	0.48%	1.08%	0.54%
UT	0.56%	0.48%	-0.08%
Emerging Research Universities			
TTU	-0.15%	0.59%	0.77%
UNT	-2.11%	-1.00%	1.93%
UTA	-0.48%	0.40%	0.98%
UTD	1.26%	3.44%	1.74%
UTEP	0.81%	-0.12%	-0.80%
UTSA	2.13%	3.18%	0.74%
Doctoral Universities			
SHSU	-1.42%	-1.44%	-0.03%
TAMUCC	3.51%	3.17%	-0.20%
TAMUCM	-1.94%	-1.26%	1.11%
TAMUK	-1.24%	-1.17%	0.09%
TWU	-2.56%	-1.51%	2.16%
TX Southern	-2.07%	-1.82%	0.44%
TX State	0.12%	0.51%	0.38%
Comprehensive Universities			
Lamar	-0.89%	-0.10%	0.96%
PVAM	-1.59%	-1.60%	-0.02%
SFA	-0.39%	0.49%	0.96%
TAMIU	5.00%	3.70%	-0.65%
Tarleton	0.84%	1.73%	0.76%
UTPA	1.65%	1.94%	0.22%
WTAMU	-1.16%	-0.77%	0.50%
Master's Universities			
Angelo	0.48%	0.52%	0.03%
Midwestern	0.48%	0.59%	0.10%
UTB	5.61%	5.00%	-0.29%
UTT	1.00%	1.15%	0.13%

Overall, 62% of the institutions had an average annual percent increase in duplicated programs, regardless of whether the duplications were out-paced or off-set by unique programs. The other 38% of institutions had an average annual percent decrease in their number of duplicated programs. Both of the research institutions had an average annual percent increase in programs and duplicated programs, but TAMU's duplication rate decreased while UT's increased. There are two prevalent programming patterns found among the emerging research institutions, a pattern of increasing programs and duplicated programs, which is shared by two institutions and a pattern of decreasing programs and increasing duplicated programs, which is shared by another two institutions. Regardless of the programming pattern, the vast majority of the emerging research institutions, five out of six, had an increase in program duplication rates. The prevalent programming pattern seen among five out of seven doctoral institutions is a decrease in program number and a decrease in program duplications. This, however, still lead to an increase in program duplication rates for five out of the seven institutions. Two prevalent programming patterns are observed among comprehensive institutions, a pattern of increasing programs and program duplications, which is common to three out of seven institutions and a pattern of decreasing programs and program duplications, which is also common to three other institutions. Like the emerging research institutions, regardless of programming pattern, the majority of comprehensive institutions, five out of seven, had an increase in program duplication rates. The master's institutions are characterized by a single programming pattern, an increase in program number and program duplications. This consistency in programming pattern did not translate into consistency in program duplication rates, however, as only three out of the four institutions had increases in duplication rates.

The doctoral institutional classification stands out as being the only classification dominated by a programming pattern of decreasing programs and program duplications.

The comprehensive institutional classification is also strongly characterized, but not dominated by the same programming pattern. Seven institutions had substantial program reductions from 1990 to 2010 that resulted in a reduction of 30% to 105% of the institutions program inventory. Four of these institutions are within the doctoral institutional classification. Most of these substantial program reductions occurred in the early part of the study, primarily between academic year 1990-1991 and academic year 1994-1995, when 728 programs were culled from the institutions within this study. This the largest cull of programs over any of the five-year intervals and to put this number in perspective, consider total program culls from the other five-year periods; 339 from academic years 1995-1996 to 1999-2000, 452 from academic years 2000-2001 to 2005-2006, and 344 from academic years 2005-2006 to 2009-2010.

The nature of the culled programs and reasons for culling the programs cannot be determined based on program duplication counts because duplicated programs were only tallied and not tracked during each of the five, five-year intervals.[20] However, the researcher suspects that a sizable portion of the culled programs may include multiple degree options for program areas. This means that an institution would offer multiple variations of a bachelor, master's or doctoral degree for a single program, although the practice appeared to be most prevalent among undergraduate programs. For instance, an institution may offer a baccalaureate level degree in Business, but may offer the following degree options; Bachelor (B.), Bachelor of Arts (B.A.), Bachelor of Science (B.S.), Bachelor of Business Administration (B.B.A.) while another institution may offer

[20] For a full description of the data collection methodology, see Chapter 4.

only a Bachelor of Business Administration (B.B.A). Often the multiple degree options were counted as unique programs because they are not what were typically offered at the institutions. The researcher recalls observing fewer instances of multiple degree options from 1995 on, especially at the bachelor's level, but this is only speculative as the decrease in multiple degree options were not tracked and formally documented. Analysis of bachelor level programs confirms there were sizable program culls, but analysis of master's level programs also reveals sizeable program culls, especially among the institutions with the doctoral classification.

Another aspect of determining whether the institutions in this study are becoming more like one another is to consider the direction of program duplication movement through examination of duplication rate levels and ranges. The research universities have the lowest rates of duplication that range from 44% to 53% across the five interval observations with a median rate of 47%. UT has consistently lower duplication rates than TAMU. The emerging research universities have duplication rates that range from 42% to 78% with a median rate of 66%. UTD stands out of this group with the lowest duplication rates that range from 42% to 56%, which more closely align with the rates of the research universities. The doctoral universities have duplication rates that range from 44% to 87% with a median rate of 66%. Many of the institutions in this group have duplication rates that are indistinguishable from those institutions in the emerging research group. TWU, however, stands out of the doctoral classification with noticeably low duplication rates in the early part of the study (44% in 1990) that eventually increase to levels consistent with other institutions in the group (63% in 2010). TWU's initially low level duplication rates coincided with their initially large number of programs. When the institution offered a large number of programs, their duplication rates were lower. After culling many programs, TWU's program numbers as well as program duplication rates aligned more closely with other institutions in the doctoral classification. TAMUCC also stands out among the doctoral universities because their duplication rates are high compared to the other institutions in the group. TAMUCC's higher duplication rates are likely due to their relatively small number of programs.

The duplication rates for comprehensive universities range from 60% to 88% with a median rate of 74%. No institutions within this group stand out among the other institutions in the classification in terms of duplication rates, but there is a clear distinction in the duplication ranges found among the comprehensive universities and the doctoral universities. The master's universities have duplication rates that range from 70% to 86% with a median rate of 80%. Like the comprehensive universities, none of the master's universities stand out among others in the peer group. The duplications rates for the master's group does, however, standout from the other universities classifications in that none of the institutions have duplication rates lower than 70%. There is greater variability among the middle classifications and less among the research and master's institutions with the research universities having the least amount of variability in duplication rates. Certainly, by and large, institutions are becoming more like one another with regard to program offerings as all but six of the 26 institutions have increasing program duplication rates; however, the institutions are not becoming more like the research institutions in terms of the proportion of duplicated programs offered.

So, they may be like the research institutions in terms of the programs offered, but not in terms of offering unique programs.

Simple OLS analysis was used to determine if the individual institutions' program duplication rates were significantly increasing or decreasing over time. Individual results were compared to those of the other institutions to determine if the institutions are becoming more like one another. The model is found to be a poor fit for 35% of the institutions as evidenced by their negative adjusted R^2 scores. The duplication rates for these institutions are not correlated with time and these institutions are found across all institutional classifications except among the emerging research universities. Most of the institutions in the master's group, three out of the four, are found to have program duplication rates that are not correlated with time.

Out of the remaining 17 institutions, four are found to have program duplication rates that are significantly correlated with time (all at $p < .05$). Tarleton, TWU, and WTAMU's duplication rates increased significantly, while UTEP's duplication rates decreased significantly across time. Although the changes in duplication rates for these institutions is significantly correlated with time, the rate of change is quite small, .01% or less per five-year interval, and these rates of change are like the rates of change for the other 13 institutions' duplication rates that are positively correlated, but not significantly correlated, with time. The four institutions with significantly correlated duplication rate changes are found across multiple institutional classifications including emerging research, doctoral and comprehensive groupings. Table 5.11 shows the results of simple

OLS analysis of each institution's duplication rates and the table is organized by institutional classification.

Table 5.11 Simple OLS Analysis of Duplication Rates for All Program Levels

Institution	Constant	Coefficient (t statistic)	Adjusted R^2	F	Significance of Model
Research Universities					
TAMU	-4.6	.003 (2.472)	0.561	6.109	0.090
UT	-0.09	.0003 (.241)	-0.308	0.058	0.825
Emerging Research Universities					
TTU	-5.81	.003 (1.874)	0.386	3.513	0.158
UNT	-14.38	.007 (2.585)	0.587	6.684	0.081
UTA	-9.468	.005 (2.690)	0.609	7.237	0.074
UTD	-14.19	.007 (2.413)	0.547	5.821	0.095
UTEP	13.146	-0.006* (-5.186)	0.866	26.892	0.014
UTSA	-6.216	.003 (1.587)	0.275	2.517	0.211
Doctoral Universities					
SHSU	-1.245	.001 (.330)	-0.287	0.109	0.763
TAMUCC	-0.012	.0004 (.133)	-0.326	0.018	0.903
TAMUCM	-9.312	.005 (2.369)	0.536	5.613	0.099
TAMUK	-0.534	.001 (.469)	-0.242	0.22	0.671
TWU	-19.282	.010* (5.561)	0.882	30.925	0.011
TX Southern	-5.915	.003 (2.516)	0.571	6.33	0.086
TX State	-2.52	.002 (1.310)	0.152	1.715	0.282
Comprehensive Universities					
Lamar	-13.741	.007 (2.393)	0.542	5.726	0.096
PVAM	1.957	-0.001 (-0.172)	-0.32	0.03	0.874
SFA	-9.207	.005 (1.929)	0.405	3.72	0.149
TAMIU	4.362	-0.002 (-0.397)	-0.267	0.157	0.718
Tarleton	-9.82	.005* (4.069)	0.795	16.558	0.027
UTPA	-3.708	.002 (1.430)	0.207	2.044	0.248
WTAMU	-5.658	.003* (3.312)	0.714	10.968	0.045
Master's Universities					
Angelo	0.173	.0003 (.332)	-0.286	0.11	0.762
Midwestern	-0.007	.0004 (.367)	-0.276	0.135	0.738
UTB	1.486	-.0003 (-.127)	-0.326	0.016	0.907
UTT	-4.742	.003 (1.164)	0.081	1.354	0.329

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

In summary, the descriptive data indicates that a substantial portion of the institutions' program offerings are becoming increasingly homogenous. Sixty-two percent (62%) of the institutions had average annual percent increases in program duplications. Sixty-nine percent (69%) of the institutions had average annual percent increases in program duplication rates. The descriptive findings also reveal that the increased homogenization is not entirely due to deliberative additions of duplicated programs, especially among most of the doctoral institutions and some comprehensive institutions. More than half (eight out of 14) of the institutions within those two classifications were found to have decreased duplicated programs. The institutional classifications are somewhat distinguishable by duplication rate levels with the middle levels being less distinct from one another suggesting homogenization among those institutions within the middle classifications. However, these classifications are distinct from the master's classification and all are distinct from the research institution classification. The further the institutional classification is from the research institution classification, the higher the minimum duplication rate seen among the institutions within the classification.

The inferential findings also suggest there is a trend toward homogenization as a majority of the institutions' (62%) duplication rates were found to be increasing over time; three of these institutions (12%) have significant rates of change. The inferential findings also make clear that any increasing homogenization is very slow to take place as indicated by the very small rates of change. It is important to point out that although the descriptive and inferential findings suggest a trend toward increasing homogenization;

the descriptive findings indicate that this may not be due to or entirely due to mimetic isomorphic change, especially among the institutions within the doctoral classification. So, while there may be some evidence to support a trend towards increasing homogenization, the fact that only two-thirds of the institutions appear to be homogenizing is insufficient for concluding that the institutions are becoming alike and thus the null hypothesis must be rejected.

5.1.2.1.2 Bachelor level programs

Examination of each institution's bachelor level programs reveals that 69% of the institutions had an average annual percent increase in program duplication rates. The other 27% of institutions had an average annual percent decrease in duplication rates. The change in duplication rates resulted from one of five patterns of programming; 1) average annual percent increase in program number and duplicated program number, 2) average annual percent decrease in program number and increase in duplicated program number, 3) average annual percent decrease in program number and decrease in duplicated program number, 4) average annual percent decrease in program number and no change in duplicated program number, and 5) no change in program number and average annual percent increase in duplicated program number.

The first programming pattern resulted in three institutions (12%) having an increase in program duplication rates and six institutions (27%) having a decrease in duplication rates. The second programming pattern resulted in three institutions (12%) having an increase in duplication rates. The third programming pattern resulted in ten institutions (38%) having an increase in duplication rates and one institution (4%) having a decrease in duplication rate. The fourth programming pattern resulted in two institutions (8%) having an increase in duplication rates. Finally, the fifth programming pattern resulted one institution (4%) having an increase in program duplication rate. The variation in programming patterns and various resulting duplication rates is evidence that the institutions within this study are not progressing on the same trajectory. Table 5.12 contains bachelor level program numbers, program duplications and duplicate rates for each institution. Table 5.13 contains the average annual percent change for total program number, total program duplications and duplication rates for each institution. Both tables are organized by institutional classification.

Overall, 50% of the institutions had an average annual percent increase in duplicated programs, regardless of whether the duplications were out-paced or off-set by unique programs. Out of the other half of institutions, 42% had an average annual percent decrease in the number of duplicated programs and 8% had no change in the number of duplicated programs. Both of the research institutions had an average annual percent increase in program numbers and duplicated programs, but an average annual percent decrease in program duplication rates. The prevalent programming pattern found among half (50%) of the emerging research institutions is a decrease in program number and program duplications. The average annual percent change in duplication rates, however, increased for four out of six of the institutions within the group. The prevalent programming pattern among the majority of the doctoral institutions, five out of seven, was an average annual percent decrease in program number and program duplications.

Table 5.12 Program Number, Duplicated Programs and Program Duplication Rates of Bachelor Level Programs for Each Institution

	Number of Programs (Number of Duplicated Programs) (Duplication Rate)				
Institution	1990	1995	2000	2005	2010
		Research Universities			
TAMU	131 (71) (54%)	133 (68) (51%)	138 (77) (56%)	144 (75) (52%)	141 (76) (54%)
UT	133 (73) (55%)	134 (71) (53%)	141 (78) (55%)	147 (80) (54%)	155 (81) (52%)
		Emerging Research Universities			
TTU	143 (82) (57%)	125 (84) (67%)	124 (81) (65%)	117 (74) (63%)	116 (83) (72%)
UNT	150 (93) (62%)	111 (71) (64%)	117 (72) (62%)	121 (73) (60%)	104 (70) (67%)
UTA	107 (76) (71%)	105 (86) (82%)	113 (84) (74%)	77 (65) (84%)	80 (64) (80%)
UTD	41 (26) (63%)	40 (27) (68%)	43 (26) (60%)	42 (28) (67%)	52 (33) (63%)
UTEP	92 (75) (82%)	85 (69) (81%)	83 (67) (81%)	86 (61) (71%)	84 (59) (70%)
UTSA	57 (47) (82%)	69 (56) (81%)	71 (60) (85%)	70 (54) (77%)	78 (61) (78%)
		Doctoral Universities			
SHSU	129 (84) (65%)	88 (63) (72%)	93 (70) (75%)	88 (65) (74%)	85 (60) (71%)
TAMUCC	33 (30) (91%)	36 (27) (75%)	39 (29) (74%)	45 (38) (84%)	43 (36) (84%)
TAMUCM	173 (96) (55%)	134 (90) (67%)	138 (96) (70%)	112 (72) (64%)	104 (75) (72%)
TAMUK	85 (66) (78%)	73 (62) (85%)	58 (51) (88%)	54 (45) (83%)	54 (46) (85%)
TWU	138 (70) (51%)	115 (60) (52%)	104 (50) (48%)	67 (41) (61%)	68 (48) (71%)
TX Southern	82 (49) (60%)	54 (37) (69%)	53 (34) (64%)	49 (35) (71%)	51 (37) (73%)
TX State	143 (79) (55%)	112 (78) (70%)	110 (74) (67%)	110 (75) (68%)	109 (81) (74%)
		Comprehensive Universities			
Lamar	100 (70) (70%)	88 (66) (75%)	78 (66) (85%)	80 (67) (84%)	82 (67) (82%)
PVAM	71 (60) (85%)	58 (45) (78%)	62 (46) (74%)	51 (37) (73%)	42 (37) (88%)
SFA	110 (64) (58%)	104 (65) (63%)	88 (66) (75%)	82 (56) (68%)	85 (64) (75%)
TAMIU	19 (17) (89%)	22 (18) (82%)	30 (24) (80%)	33 (27) (82%)	34 (24) (71%)
Tarleton	65 (42) (65%)	61 (37) (61%)	71 (48) (68%)	65 (43) (66%)	73 (55) (75%)
UTPA	57 (47) (82%)	54 (46) (85%)	57 (48) (84%)	55 (47) (85%)	57 (50) (88%)
WTAMU	117 (82) (70%)	118 (84) (71%)	95 (67) (71%)	87 (66) (76%)	86 (65) (76%)
		Master's Universities			
Angelo	48 (40) (83%)	46 (38) (83%)	48 (40) (83%)	44 (39) (89%)	49 (42) (86%)
Midwestern	56 (43) (77%)	50 (42) (84%)	49 (42) (86%)	50 (44) (88%)	51 (45) (88%)
UTB	24 (19) (79%)	22 (16) (73%)	31 (25) (81%)	37 (29) (78%)	43 (31) (72%)
UTT	54 (45) (83%)	49 (37) (76%)	52 (42) (81%)	52 (42) (81%)	51 (45) (88%)

This, however, led to an increase in program duplication rates for six out of seven institutions. The prevalent programming pattern observed among three out of the seven comprehensive institutions is, like the doctoral institutions, a decrease in program number and a decrease in program duplications. Six out of the seven comprehensive institutions had an increase in program duplicate rates. The prevalent programming pattern among two out of the four master's institutions is an increase in program number and an increase in program duplications. Three quarters of the master's institutions had an average annual percent increase in duplication rates.

Table 5.13 Average Annual Percent Change in Program Number, Program Duplications and Duplication Rates for Bachelor Level Programs for Each Institution

	Annual Average Percent Change		
Institution	Program Number	Program Duplications	Duplication Rate
Research Universities			
TAMU	0.38%	0.35%	-0.03%
UT	0.83%	0.55%	-0.24%
Emerging Research Universities			
TTU	-0.94%	0.06%	1.24%
UNT	-1.53%	-1.24%	0.43%
UTA	-1.26%	-0.79%	0.63%
UTD	1.34%	1.35%	0.00%
UTEP	-0.43%	-1.07%	-0.69%
UTSA	1.84%	1.49%	-0.26%
Doctoral Universities			
SHSU	-1.71%	-1.43%	0.42%
TAMUCC	1.52%	1.00%	-0.40%
TAMUCM	-1.99%	-1.09%	1.50%
TAMUK	-1.82%	-1.52%	0.49%
TWU	-2.54%	-1.57%	1.96%
TX Southern	-1.89%	-1.22%	1.07%
TX State	-1.19%	0.13%	1.73%
Comprehensive Universities			
Lamar	-0.90%	-0.21%	0.84%
PVAM	-2.04%	-1.92%	0.21%
SFA	-1.14%	0.00%	1.47%
TAMIU	3.95%	2.06%	-1.06%
Tarleton	0.62%	1.55%	0.83%
UTPA	0.00%	0.32%	0.32%
WTAMU	-1.32%	-1.04%	0.39%
Master's Universities			
Angelo	0.10%	0.25%	0.14%
Midwestern	-0.45%	0.23%	0.75%
UTB	3.96%	3.16%	-0.45%
UTT	-0.28%	0.00%	0.29%

The middle three institutional classifications are predominated by a programming pattern of decreasing program numbers and decreasing program duplications and yet the majority of institutions within each of these groups ended up with an average annual percent increase in duplication rates. The middle institutional classifications are book-ended by the research institutions on one end and master's institutions on the other end, both of which have a prevalent programming pattern of increasing program number and program duplications. However, for the research institutions this resulted in a decrease in program duplication rates while the majority of institutions within the master's institutional classification had an increase in program duplication rates. The prevalent representation of the decreasing program numbers and program duplications among the middle three institutional classifications is a manifestation of the program culls discussed in the previous sub-section. Sixteen of the institutions had program reductions that ranged from a loss 6% to 103% of their bachelor programs from 1990 to 2010. Of those 16, 11 institutions lost 25% or more of their programs from 1990 to 2010. Out of those 11, six institutions lost 50% or more of their program from 1990 to 2010. TWU was one of those six that lost 103% of their programs from 1990 to 2010. There were institutions that had substantial growth in bachelor level programs, including TAMIU and UTB. These institutions had a small number of programs initially in 1990, 19 and 24 respectively, and this is mostly like due to both institutions being relatively new in 1990. By 2010 both institutions had program numbers comparable to the other institutions with their respective peer groups. In sum, even with culls in programming, half of the institutions (50%) managed to have increased in program duplications and even more of the institutions (69%) ended up with increases in program duplication rates.

The research universities have the lowest rates of duplication that range from 51% to 56% across the five interval observations with a median rate of 54%. Emerging research institutions have duplication rates that range from 57% to 85%; however, the rates in the 50% range of the spectrum are outliers and found in only two out of the 30 observations for the universities within the this group. The typical duplication rates for the emerging research group fall in the 60% to 80% range and the median rate is 71%. The doctoral universities' duplication rates are more extreme in range than the emerging research universities', with a range of 48% to 91%. Like the emerging research universities, the duplication rates at the low end of the range are outliers. Only five out of the 35 observations are in the 40% to 50% range. Only one of the observations is in the 90% range. The typical duplication rates fall in the 60% to 80% range, which are indistinguishable from the emerging research group and the median rate is also 71%. The comprehensive universities' duplication rates are similar to those for emerging research and doctoral universities and range from 58% to 89%. Only a single observation falls in the 50% range with the remaining duplication rates in the 60% to 80% range. The median duplication rate for the comprehensive universities is also close to that of the emerging research and doctoral universities at 75%. The master's universities have duplication rates that range from 72% to 89% with most in the 80% range and a median rate of 83%. Outliers were not observed among master's universities. The research universities and the master's universities duplication rate levels stand out from the three institutional classifications between them.

Returning to the outlying institutions with low duplication rates that are found among the emerging research, doctoral and comprehensive institutional classifications, five out of six of these institutions have commonalities (UTD is not like the other outliers). The low level, outlying duplication rates for these institutions are observed in the early part of the study and disappear by the middle of the study time frame. Another commonality is that these are some of the same institutions that had dramatic decreases in program numbers from 1990 to 2010. For instance, TAMUCM had 173 bachelor level programs in 1990, but by 2010, they had 104 programs. As the program numbers are reduced, their program duplication rates increase and normalize with the rest of the institutions within their group. Like what is seen among the institutional classifications when all degree levels are combined, the middle three institutional classifications for bachelor level programs have greater variability in duplication rates. The institutions are becoming more like one another in their program offerings as 69% of them have average annual increases in program duplication rates; however, the institutions are not becoming more like the research institutions in terms of the proportion of duplicated programs offered. So, they may be like research institutions in terms of the programs offered, but not in terms of offering unique programs.

Simple OLS analysis was used to determine if individual institutions' program duplication rates were significantly increasing or decreasing over time. Individual results were compared to the results of the other institutions to determine if the institutions are becoming more like one another. The model was found to be a poor fit for seven (27%) of the institutions as evidenced by the negative adjusted R^2 score. The duplication rates for these institutions are not correlated with time. These institutions are found across all institutional classifications; however, both of the research institutions have duplication rates that are not correlated with time.

Out of the remaining 19 institutions, four (15%) were found to have program duplication rates change significantly across time (all at $p < .05$). UTPA and Midwestern's program duplication rates increased significantly, while UTEP and TAMIU's duplication rates decreased significantly across time. Although the changes in duplication rates for these institutions was significantly correlated with time, the rate of change is quite small, .008% or less per five-year interval, which aligns with most of the rates of change for the other 15 institutions with rates that are correlated, but not significantly correlated, across time. Further, the rates of change are smaller than the rate of change for TWU (.01%). Of those 15 institutions with duplication rates correlated, but not significantly correlated with time, 14 (54%) were found to have duplication rates of change positively correlated with time, while the remaining institution had duplication rates negatively correlated with time. So, regardless of statistical significance, 62% of the institutions had duplication rates increase over time, which indicates that the institutions' bachelor level programming is becoming more homogeneous. However, the rates of change are so small, even for the two institutions with significant rates of changes, thus making the pace of change minute. Change in program duplication rates, on a practical level, is virtually undetectable, most especially among those institutions with more variability in duplication rate changes (i.e. those with changes not significantly correlated with time). Table 5.14 contains the details from the regression analysis of each institutions bachelor level program duplication rates.

Table 5.14 Simple OLS Analysis Results for Bachelor Level Duplication Rates

Institution	Constant	Coefficient (t statistic)	Adjusted R^2	F	Significance of Model
Research Universities					
TAMU	0.394	.00007 (.052)	-0.332	0.003	0.962
UT	2.072	-.001 (-.912)	-0.044	0.832	0.429
Emerging Research Universities					
TTU	-9.139	.005 (1.901)	0.395	3.616	0.153
UNT	-2.166	.001 (.768)	-0.114	0.589	0.499
UTA	-7.401	.004 (1.253)	0.125	1.57	0.299
UTD	0.935	-.0001 (-.071)	-0.331	0.005	0.948
UTEP	13.893	-.007* (-3.484)	0.736	12.141	0.04
UTSA	5.815	-.003 (-1.496)	0.236	2.237	0.232
Doctoral Universities					
SHSU	-4.571	.003 (1.095)	0.048	1.2	0.353
TAMUCC	2.793	-.001 (-.195)	-0.317	0.038	0.858
TAMUCM	-11.499	.006 (1.959)	0.415	3.838	0.145
TAMUK	-4.554	.003 (1.165)	0.082	1.358	0.328
TWU	-18.938	.010 (2.596)	0.589	6.741	0.081
TX Southern	-10.723	.006 (2.771)	0.625	7.679	0.07
TX State	-14.003	.007 (2.480)	0.563	6.153	0.089
Comprehensive Universities					
Lamar	-12.078	.006 (2.376)	0.537	5.645	0.098
PVAM	-0.062	.0004 (.088)	-0.33	0.008	0.936
SFA	-15.325	.008 (2.644)	0.6	6.988	0.077
TAMIU	15.911	-0.008* (-3.289)	0.711	10.82	0.046
Tarleton	-10.103	.005 (2.226)	0.497	4.955	0.112
UTPA	-3.462	.002* (3.358)	0.72	11.276	0.044
WTAMU	-5.534	.003 (3.114)	0.685	9.698	0.053
Master's Universities					
Angelo	-3.469	.002 (1.638)	0.296	2.683	0.2
Midwestern	-9.915	.005* (3.801)	0.771	14.45	0.032
UTB	4.17	-.002 (-.633)	-0.176	0.4	0.572
UTT	-5.215	.003 (1.043)	0.021	1.088	0.374

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

The regression results do not appear to cluster in any particular institutional classification other than the duplication rates for the two research universities not being correlated with time. Other institutions with duplication rates that are not correlated with time are found across the other four institutional classifications. The four institutions that have duplication rate changes significantly correlated with time are found in three out of the five institutional classifications.

To summarize, the descriptive findings indicate through the increased duplications rates for a majority of the institutions (69%) that there is a trend toward increased homogenization of bachelor level programs. The descriptive findings also reveal that the increased homogenization is not primarily due to deliberative additions of duplicated programs. Only 50% of the institutions had an average annual percent increase in program duplications, the other half of the institutions either had decreases or no change in program duplications. Further, the middle three institutional classifications, those most likely to and capable of mimicking the research universities were found most typically to have decreased duplicated programs. Another factor that could be perceived as evidence that the institutions are becoming more homogeneous is that the emerging research, doctoral and comprehensive institutional classifications are indistinguishable by duplication rate level. This may initially seem to suggest that institutions' bachelor level programs are homogenizing, but this may also be an artifact of institutions having the expected core or foundational degree programs such as Biology, English or Psychology. Additionally, the master's classification has distinct duplication rate levels from the other institution classifications, so not all of the classifications are indistinguishable.

The inferential findings also suggest there is a trend toward homogenization as a majority of the institutions' (62%) duplication rates were found to be increasing over time. Only two of those institutions (8%), however, have duplication rates that are significant. So, although the descriptive and inferential findings suggest a trend toward increasing homogenization, the descriptive findings indicates that this is not due to mimetic isomorphic change. The inferential findings also make clear that any increasing homogenization is very slow to take place as indicated by the very small rates of change. Also, while there may be some evidence to support a trend towards increasing homogenization, not all institutions are homogenizing as about a third of the institutions either had no change or an average annual percent decrease in program duplication rates and a little less than a third had program duplication rates that were not correlated with time. This certainly is evidence that the institutions are not all becoming more alike in terms of bachelor level program duplications and thus the null hypothesis must be rejected.

5.1.2.1.3 Masters level programs

Examination of each institution's program duplications for master's level programs reveals that 54% of the institutions had an average annual percent increase in program duplication rate. The other 46% of institutions had an average annual percent decrease in duplication rates. The average annual percent change in duplication rates resulted from one of two patterns of programming; 1) average annual percent increase in program number and duplicated program number and 2) average annual percent decrease in program number and decrease in duplicated program number.

The first programming pattern resulted in nine institutions (35%) having an increase in their average annual percent change duplication rate and eight institutions (31%) having a decrease in their average annual percent change in duplication rate. The second programming pattern resulted in five institutions (19%) having an average annual increase in their duplication rate and four institutions (15%) having a decrease in the duplication rate. There is less variation in programming patterns among the institutions at the master's level as compared to the bachelor level as well as a noticeably lower proportion of institutions with increases in program duplications rates. Table 5.15 contains master's level program number, program duplications and duplicate rates for each institution. Table 5.16 contains the average annual percent change for program number, program duplications and duplication rates for each institution. Both tables are organized by institutional classification.

Overall, 50% of the institutions had an average annual percent increase in duplicated programs, regardless of whether the duplications are out-paced or off-set by unique programs. The other 50% of institutions had an average annual percent decrease in the number of duplicated programs. Both of the research institutions had an average annual percent increase in program number and duplicated programs, which resulted in an average annual percent increase of program duplication rate for TAMU and a decrease in duplication rate for UT. The prevalent programming pattern observed among five out of six of the emerging research institutions is an increase in program number and increase in program duplications. Five out of six of the emerging research institutions also had an increase in program duplication rates. The emerging research group is found largely to be increasing their programmatic offerings as well as duplicated program offerings.

Table 5.15 Program Number, Duplicated Programs and Program Duplication Rates of Master's Level Programs for Each Institution

	Number of Programs (Number of Duplicated Programs) (Duplication Rate)				
Institution	1990	1995	2000	2005	2010
Research Universities					
TAMU	130 (59) (45%)	133 (62) (47%)	141 (66) (47%)	149 (66) (44%)	149 (75) (50%)
UT	146 (67) (46%)	157 (68) (43%)	158 (69) (44%)	173 (75) (43%)	171 (70) (41%)
Emerging Research Universities					
TTU	97 (65) (67%)	95 (67) (71%)	106 (73) (69%)	108 (72) (67%)	113 (81) (72%)
UNT	212 (90) (42%)	174 (79) (45%)	178 (89) (50%)	180 (79) (44%)	120 (75) (63%)
UTA	79 (43) (54%)	80 (52) (65%)	87 (56) (64%)	82 (55) (67%)	84 (61) (73%)
UTD	44 (15) (34%)	45 (17) (38%)	54 (18) (33%)	50 (24) (48%)	61 (32) (52%)
UTEP	72 (53) (74%)	83 (53) (64%)	81 (56) (69%)	83 (54) (65%)	91 (58) (64%)
UTSA	63 (27) (43%)	58 (34) (59%)	65 (38) (58%)	69 (43) (62%)	71 (46) (65%)
Doctoral Universities					
SHSU	78 (54) (69%)	77 (51) (66%)	76 (57) (75%)	55 (40) (73%)	58 (35) (60%)
TAMUCC	14 (11) (79%)	20 (16) (80%)	27 (23) (85%)	29 (26) (90%)	32 (27) (84%)
TAMUCM	102 (66) (65%)	103 (71) (69%)	104 (58) (56%)	76 (49) (64%)	76 (58) (76%)
TAMUK	59 (45) (76%)	54 (41) (76%)	54 (40) (74%)	53 (42) (79%)	51 (38) (75%)
TWU	122 (51) (42%)	114 (46) (40%)	96 (50) (52%)	69 (34) (49%)	62 (37) (60%)
TX Southern	58 (36) (62%)	33 (19) (58%)	30 (21) (70%)	30 (20) (67%)	28 (17) (61%)
TX State	63 (39) (62%)	73 (36) (49%)	83 (48) (58%)	88 (49) (56%)	92 (48) (52%)
Comprehensive Universities					
Lamar	46 (30) (65%)	47 (27) (57%)	37 (29) (78%)	37 (26) (70%)	39 (29) (74%)
PVAM	58 (43) (74%)	52 (34) (65%)	55 (39) (71%)	56 (38) (68%)	42 (31) (74%)
SFA	43 (28) (65%)	53 (37) (70%)	59 (41) (69%)	51 (32) (63%)	53 (34) (64%)
TAMIU	13 (10) (77%)	20 (11) (55%)	25 (20) (80%)	27 (23) (85%)	29 (22) (76%)
Tarleton	18 (13) (72%)	19 (15) (79%)	22 (18) (82%)	21 (18) (86%)	23 (18) (78%)
UTPA	25 (20) (80%)	32 (27) (84%)	42 (40) (95%)	46 (42) (91%)	48 (41) (85%)
WTAMU	60 (41) (68%)	58 (47) (81%)	47 (38) (81%)	48 (38) (79%)	49 (39) (80%)
Master's Universities					
Angelo	25 (18) (72%)	25 (20) (80%)	26 (21) (81%)	29 (21) (72%)	31 (22) (71%)
Midwestern	17 (16) (94%)	26 (21) (81%)	27 (18) (67%)	26 (18) (69%)	29 (21) (72%)
UTB	9 (9) (100%)	15 (13) (87%)	16 (15) (94%)	22 (22) (100%)	26 (24) (92%)
UTT	31 (20) (65%)	33 (20) (61%)	36 (26) (72%)	40 (31) (78%)	49 (34) (69%)

The prevalent programming pattern observed among five out of seven of the doctoral institutions is a decrease in program number and decrease in program duplications. Four out of seven of the doctoral institutions also have a decrease in program duplication rates. The doctoral institutions, in contrast to the emerging research institutions, are found to be reducing programmatic homogeneity within their master's level programming.

Table 5.16 All Average Annual Percent Change in Program Number, Program Duplications and Duplication Rates of Master's Level Programs for Each Institution

	Annual Average Percent Change		
Institution	Program Number	Program Duplications	Duplication Rate
Research Universities			
TAMU	0.73%	1.36%	0.55%
UT	0.86%	0.22%	-0.54%
Emerging Research Universities			
TTU	0.82%	1.23%	0.35%
UNT	-2.17%	-0.83%	2.36%
UTA	0.32%	2.09%	1.67%
UTD	1.93%	5.67%	2.69%
UTEP	1.32%	0.47%	-0.67%
UTSA	0.63%	3.52%	2.56%
Doctoral Universities			
SHSU	-1.28%	-1.76%	-0.64%
TAMUCC	6.43%	7.27%	0.37%
TAMUCM	-1.27%	-0.61%	0.90%
TAMUK	-0.68%	-0.78%	-0.12%
TWU	-2.46%	-1.37%	2.14%
TX Southern	-2.59%	-2.64%	-0.11%
TX State	2.30%	1.15%	-0.79%
Comprehensive Universities			
Lamar	-0.76%	-0.17%	0.70%
PVAM	-1.38%	-1.40%	-0.02%
SFA	1.16%	1.07%	-0.07%
TAMIU	6.15%	6.00%	-0.07%
Tarleton	1.39%	1.92%	0.42%
UTPA	4.60%	5.25%	0.34%
WTAMU	-0.92%	-0.24%	0.82%
Master's Universities			
Angelo	1.20%	1.11%	-0.07%
Midwestern	3.53%	1.56%	-1.15%
UTB	9.44%	8.33%	-0.38%
UTT	2.90%	3.50%	0.38%

The prevalent programming pattern observed among four out of seven of the comprehensive institutions is an increase in program number and increase in program duplications. Four out of seven of the comprehensive institutions also have an increase in program duplication rates, an indication that proportionately more duplicated program are being added to the institutions' program inventories. All four of the master's institutions share the programming pattern of an increase in program number and increase in program duplications. However, interestingly, this resulted in only one institution having an increase in program duplication rate while the other three institutions had a decrease in program duplication rate. The master's institutions are, by and large, adding more unique rather than duplicated master's programs.

The doctoral institutional classification stands out among the institutional classifications because it is the only group where the majority of institutions within the group have average annual percent decreases in program number and program duplications. A similar situation is observed with the doctoral classification for bachelor level program duplications; yet, unlike the increase found for bachelor duplication rates, the majority of institutions had an average annual percent decrease in master's level duplication rates rather than the increase seen among bachelor level programs. Many of the same institutions that culled relatively large numbers of bachelor level programs also culled relatively large numbers of master's programs. Nine institutions (35%) in total culled programs and five of them are found in the doctoral classification. The nine institutions reduced their master's level program offerings between 16% and 107% from 1990 to 2010. Six institutions reduced their program offerings by 25% or more from

1990 to 2010. Out of those six institutions, three reduced their program offerings by 50% or more. TX Southern stands out has having the greatest decrease in program offerings as they reduced their master's level programs by 107% from 1990 to 2010. These program number decreases out-paced the reduction in program duplications resulting in reduced program duplication rates for the doctoral groups, but the reasons for these reductions is unknown based on the data collected for this research.[21]

Examination of program duplication movement through analysis of duplication rate levels and ranges was also conducted on master's level programs. The research universities have the lowest rates of duplication that range from 41% to 50% across the five interval observations with a median rate of 45%. Emerging research institutions have duplication rates that range from 34% to 74%; however, the rates in the 30% range of the spectrum are unique to UTD. UTD is the only institution among the emerging research universities that has duplication rates lower than, in some years, the research universities; however, by 2010, the duplication rate becomes aligned with the other institutions within the emerging research group. The other institutions in the emerging research group have duplication rates that are in the 40% to 70% range. The median duplication rate for the emerging research group is 63%. The doctoral universities' duplication rates range from 42% to 84%. There are few rates in the 40% range and these are seen only among a couple of institutions. The median duplication rate for the doctoral institutions is 66%. The comprehensive universities' duplication rates range from 55% to 91%. Only two observations fall in the 50% range with the typical

[21] For a full description of the data collection methodology, see Chapter 4.

duplication rates ranging from 60% to 80%. The median duplication rate for the comprehensive universities is 76%. The master's universities have duplication rates that range from 61% to 100% with a median rate of 75%.

The duplication rates extend much higher than those observed among bachelor level programs and this may be a result of the relatively smaller number of master's level programs offered at some of the institutions. For the most part, there are clear margins for the minimum and maximum duplication rates seen within institutional classifications. Each classification, from emerging research institutions to master's institutions, has a range of duplications that is a about a decile higher at the minimum and the maximum of the range when moving each classification away from the research universities classification. The exception to this is the emerging research group where the lowest part of duplication range is lower than the research universities range. As would be expected, some of the institutions in the doctoral classification that reduced program numbers and program duplications also had a reduction in program duplication rate and this is the case for three out of the five institutions. Two other institutions have increases in the program duplication rate from 1990 to 2010. TWU is one of the institutions with an increase in program duplication rates and this is also the institution that had the outlying low duplication rates within the group; however, by 2010, TWU's program duplication rates align with those rates of other institutions within the group. The degree of homogeneity observed at the master's program level is lower than that observed and the bachelor's level as might be expected given public expectations that universities offer undergraduate degree programs in foundational disciplines such as Biology, English or Political

Science. Even if less homogeneity is expected among graduate level programs, it is difficult to make the case that the master's level programs have become more homogenous since 1990, since half of the institutions (50%) reduced their duplicated programs and almost half of the institutions (46%) had a reduction in their program duplication rates. The inferential analysis confirms the findings from the descriptive analysis.

Simple OLS analysis was used to determine if an individual institution's program duplication rates were significantly increasing or decreasing over time. Individual institution's results were compared to those of the other institutions to determine if the institutions are becoming more like one another. The model was found to be a poor fit for 12 (46%) of the institutions as evidenced by the negative adjusted R^2 score. The duplication rates for these institutions are not correlated with time. These institutions are found across the doctoral, comprehensive and master's universities classifications.

Out of the remaining 14 institutions, three (12%) were found to have program duplication rates change significantly across time (all at $p < .05$). UTA and TWU both have program duplication rates positively and significantly correlated with time, while UT has program duplication rates negatively and significantly correlated with time. Although the duplication rate changes for these institutions are significantly correlated with time, the rate of change is very small, .01% or less per five-year interval. Also, the significant rates of change align with the rates of change for the other 11 institutions' rates of change that are correlated, but not significantly correlated, with time. Of those

11 institutions, nine (35%) were found to have duplication rates positively correlated with time, the remaining two (8%) had duplications rates negatively correlated with time.

The research and emerging research universities show the least variability in duplication rate change as evidenced by the absence of institutions with negative adjusted R^2 scores, but only one institution within each group has duplication rates significantly correlated with time. The other institution with significant duplication rate change is found among the doctoral universities. Each of the groups have institutions that either have duplication rates changes correlated with time, but correlated in different directions or duplication rate changes correlated and uncorrelated with time. No single institutional classification is exclusively dominated by a single form of duplication rate change. Table 5.17 contains the data from the regression analysis of each institutions master's level program duplication proportions.

Table 5.17 Simple OLS Analysis Results for Master's Level Duplication Rates

Institution	Constant	Coefficient (t statistic)	Adjusted R^2	F	Significance of Model
		Research Universities			
TAMU	-3.793	.002 (1.689)	0.317	2.854	0.19
UT	4.833	-0.002* (-4.547)	0.831	20.676	0.02
		Emerging Research Universities			
TTU	-2.59	.002 (1.179)	0.089	1.391	0.323
UNT	-18.601	.010 (3.137)	0.689	9.841	0.052
UTA	-15.752	.008* (4.319)	0.815	18.656	0.023
UTD	-18.192	.009 (2.357)	0.532	5.554	0.1
UTEP	8.266	-0.004 (-1.546)	0.258	2.389	0.22
UTSA	-19.002	.010 (2.844)	0.639	8.085	0.065
		Doctoral Universities			
SHSU	7.19	-0.003 (-0.807)	-0.095	0.652	0.479
TAMUCC	-6.515	.004 (1.374)	0.181	1.887	0.263
TAMUCM	-8.319	.004 (.869)	-0.065	0.754	0.449

Table 5.17 – Continued

TAMUK	2.014	-0.0001 (-0.41)	-0.263	0.168	0.709
TWU	-19.327	.010* (4.625)	0.836	21.394	0.019
TX Southern	-1.058	.001 (.224)	-0.311	0.05	0.837
TX State	6.537	-0.003 (-0.889)	-0.055	0.79	0.44
Comprehensive Universities					
Lamar	-12.857	.007 (1.370)	0.18	1.876	0.264
PVAM	-1.03	.001 (.300)	-0.294	0.09	0.784
SFA	3.436	-0.001 (-0.591)	-0.194	0.349	0.596
TAMIU	-8.0463	.004 (.514)	-0.225	0.264	0.643
Tarleton	-5.392	.003 (.909)	-0.045	0.827	0.43
UTPA	-5.647	.003 (.767)	-0.115	0.589	0.499
WTAMU	-7.994	.004 (1.341)	0.166	1.798	0.272
Master's Universities					
Angelo	4.071	-0.002 (-0.469)	-0.242	0.22	0.671
Midwestern	22.759	-0.011 (-1.896)	0.393	3.593	0.154
UTB	3.824	-0.001 (-0.336)	-0.285	0.113	0.759
UTT	-8.156	.004 (1.005)	0.002	1.009	0.389

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

In summary, the descriptive data indicates that only a little over half (54%) of the institutions had average annual percent increase in program duplication rates. It is difficult to suggest that this would constitute a trend of homogenization of master's level programs, especially in light of 50% of the institutions having an average annual percent decrease in program duplications. There is overlap of the duplications rate levels between institutional classifications, but minimums and maximums of the ranges are discrete from the adjacent classifications. The duplication rates increase the further the classification is from the research universities group.

The inferential findings indicate that only 42% of the institutions' duplication rates are increasing over time, with two institutions having significant rates of increase. Further compounding the evidence against a trend of increasing homogeneity are the very small rates of change found among these institutions. The inferential data supports the findings from the descriptive data and the findings from both lines of data do not suggest a trend towards increasing homogenization of master's level programs. Further, the findings clearly indicate that the institutions are not becoming more alike, so the null Hypothesis 1s rejected.

5.1.2.1.4 Doctoral level programs

The analysis of doctoral level program duplications has a challenge unique from the other degree levels in that not all of the 26 institutions offered doctoral programs during the study time period. Neither Angelo nor Midwestern offered any doctoral programs during this time. Out of the other 24 institutions, almost half (11) did not offer any doctoral programs for at least one of the five-year intervals and UTB and UTT did not offer doctoral programs until the 2010 observation interval. It is at this point, on rudimentary level, that the null hypothesis could be rejected; however, descriptive and inferential analysis was conducted and the findings are presented taking the limitations of data availability into consideration.

Examination of each of the 22 institutions where there were at least two observations for program duplications reveal that 50% had an average annual percent increase in doctoral level program duplication rates, 27% had a decrease in duplication rates and 23% had no change in duplication rates. The condition of the duplication rate change resulted from seven different programming patterns, although one could argue the limited observations reduce the possibility that what is observed is actually a pattern. The programming will, however, be discussed as a pattern to maintain consistency with the presentation of findings for other degree levels and also simply as a descriptive device. The seven programming patterns are as follows; 1) average annual percent increase in program number and duplicated program number, 2) average annual percent decrease in program number and increase in program duplication number, 3) average annual percent decrease in program number and program duplication number, 4) average annual percent increase in program number and no change program duplication number, 5) no change in program number and average annual percent decrease in program duplication number, 6) no change in program number and average annual percent increase in program duplication number, and 7) no change in program number and program duplication number.

The first programming pattern resulted in six institutions (27%) having an increase in program duplication rates; two institutions (9%) having a decrease in program duplication rates; and three institutions (14%) having no change in program duplication rates. The second programming pattern resulted in two institutions (9%) having an increase in program duplication rates. The third programming pattern resulted in two institutions (9%) having an increase in program duplication rates and one institution having a decrease in program duplication rate. The fourth programming pattern resulted in two institutions (9%) having a decrease in program duplication rates. The fifth programming pattern resulted in a single institution having a decrease in program duplication rates. The sixth programming pattern resulted in one institution having an increase in program duplication rate. The seventh programming pattern resulted in two institutions having no change in program duplication rates. The numerous programming patterns observed among doctoral programs indicates that the institutions are clearly not programming in the same way. Table 5.18 contains program number, program duplications and duplication rates for each institution. Table 5.19 contains the average annual percent changes for program number, program duplications and duplication rates for each institution. Both tables are organized by institutional classification.

Table 5.18 Program Number, Duplicated Programs and Program Duplication Rates of Doctoral Level Programs for Each Institution

	Number of Programs (Number of Duplicated Programs) (Duplication Rate)				
Institution	1990	1995	2000	2005	2010
Research Universities					
TAMU	90 (37) (41%)	90 (37) (41%)	95 (49) (52%)	92 (49) (53%)	95 (52) (55%)
UT	132 (49) (37%)	138 (48) (35%)	129 (58) (45%)	131 (54) (41%)	131 (56) (43%)
Emerging Research Universities					
TTU	56 (31) (55%)	50 (28) (56%)	55 (37) (67%)	56 (34) (61%)	58 (35) (60%)
UNT	118 (42) (36%)	86 (33) (38%)	76 (34) (45%)	74 (37) (50%)	53 (35) (66%)
UTA	31 (19) (61%)	33 (19) (58%)	37 (21) (57%)	38 (23) (61%)	32 (24) (75%)
UTD	30 (7) (23%)	31 (8) (26%)	32 (7) (22%)	30 (12) (40%)	31 (16) (52%)
UTEP	2 (1) (50%)	7 (4) (57%)	10 (3) (30%)	15 (6) (40%)	18 (9) (50%)
UTSA		2 (1) (50%)	4 (2) (50%)	19 (13) (68%)	22 (14) (64%)
Doctoral Universities					
SHSU	1 (1) (100%)	1 (0) (0%)	3 (2) (67%)	5 (5) (100%)	6 (4) (67%)
TAMUCC		1 (1) (100%)	2 (2) (100%)	6 (5) (83%)	5 (4) (80%)
TAMUCM	29 (20) (69%)	11 (4) (36%)	7 (4) (57%)	6 (5) (83%)	6 (3) (50%)
TAMUK	1 (0) (0%)	2 (1) (50%)	2 (1) (50%)	4 (3) (75%)	4 (1) (25%)
TWU	54 (18) (33%)	40 (11) (28%)	26 (15) (58%)	23 (12) (52%)	23 (12) (52%)
TX Southern	7 (3) (43%)	6 (2) (33%)	5 (2) (40%)	6 (3) (50%)	7 (2) (29%)
TX State			2 (0) (0%)	6 (0) (0%)	10 (1) (10%)
Comprehensive Universities					
Lamar	6 (1) (17%)	2 (1) (50%)	2 (1) (50%)	4 (3) (75%)	4 (3) (75%)
PVAM			1 (0) (0%)	4 (2) (50%)	4 (2) (50%)
SFA			2 (2) (100%)	2 (2) (100%)	3 (3) (100%)
TAMIU				1 (0) (0%)	1 (1) (100%)
Tarleton			1 (1) (100%)	1 (1) (100%)	1 (1) (100%)
UTPA		3 (2) (67%)	3 (2) (67%)	3 (3) (100%)	4 (2) (50%)
WTAMU				1 (0) (0%)	1 (0) (0%)
Master's Universities					
Angelo					
Midwestern					
UTB					1 (1) (100%)
UTT					2 (1) (50%)

Note: Blank space indicates no doctoral programs offered during the specified interval

Table 5.19 Changes in Program Number, Program Duplications, and Duplication Rates of Doctoral Programs for Each Institution

Institution	Annual Average Percent Change: Program Number	Program Duplications	Duplication Rate
Research Universities			
TAMU	0.28%	2.03%	1.66%
UT	-0.04%	0.71%	0.76%
Emerging Research Universities			
TTU	0.18%	0.65%	0.45%
UNT	-2.75%	-0.83%	4.28%
UTA	0.16%	1.32%	1.12%
UTD	0.17%	6.43%	6.06%
UTEP	40.00%	40.00%	0.00%
UTSA[1]	66.67%	86.67%	1.82%
Doctoral Universities			
SHSU	25.00%	15.00%	-1.67%
TAMUCC[1]	26.67%	20.00%	-1.33%
TAMUCM	-3.97%	-4.25%	-1.38%
TAMUK	15.00%	0.00%	-2.50%
TWU	-2.87%	-1.67%	2.83%
TX Southern	0.00%	-1.67%	-1.67%
TX State[2]	40.00%	100.00%	1.00%
Comprehensive Universities			
Lamar	-1.67%	10.00%	17.50%
PVAM[2]	30.00%	5.00%	0.00%
SFA[2]	5.00%	5.00%	0.00%
TAMIU[3]	0.00%	20.00%	20.00%
Tarleton[2]	0.00%	0.00%	0.00%
UTPA[1]	2.22%	0.00%	-1.67%
WTAMU[3]	0.00%	0.00%	0.00%
Master's Universities			
Angelo	NA	NA	NA
Midwestern	NA	NA	NA
UTB[4]	NA	NA	NA
UTT[4]	NA	NA	NA

[1] Four observations only since 1995

[2] Three observations only since 2000

[3] Two observations only since 2005

[4] One observation only since 2010

Overall, 50% of the 22 institutions had an average annual percent increase in program duplications, regardless of whether the duplications are out-paced or off-set by unique programs. Another 27% of the institutions had an average annual percent decrease in program duplications and the other 23% of institutions had no change in program duplications. TAMU had an average annual percent increase in program number and program duplications, while UT had an average annual percent decrease in program number, but increase in program duplications. Both programming patterns resulted in the research institutions having average annual percent increases in program duplication rate. The emerging research group is overwhelmingly represented, in five out of six institutions by an increase in program number and an increase in program duplications. All of the emerging research institutions had an increase in program duplication rates. The doctoral institutions are represented by four different programming patterns, but an increase in program number and program duplication number is the pattern observed most frequently in three out of the seven institutions. Five out of the seven institutions did, however, have a decrease in their program duplication rate. The comprehensive universities are characterized by small numbers of programs, most typically less than five. Small changes can have dramatic impacts on the nature of the programming pattern expressed by the institution and, thusly, five different programming patterns are observed among these institutions. The two most frequently observed patterns are an increase in program number with an increase in program duplications and no change in program number or program duplications. In most instances, for four out of the seven institutions, program duplication rates remained unchanged. For doctoral programs, it seems that institutions are either on the trajectory of adding programs and adding duplicated programs or institutions are dabbling in doctoral programs with only a handful of offerings. Doctoral program dabbling is very prominent among the doctoral universities, but exhaustive among comprehensive universities.

The institutions differ in program duplication rate levels and ranges. The research universities have duplication rates that range from 35% to 55% with a median rate of 42%. UT's rates have remained in the 30% to 40% range, while TAMU's have consistently risen into the 50% range. The emerging research institutions' duplication rates range from 23% to 75% with a median rate of 52%. UTD is the only institution among emerging research universities to have duplication rates in the 20% range. The institution maintained rates in this range until the 2005 interval when their rate increased and aligned with other institutions within the classification. The highest duplication rate of 75% is the only observation in the 70% range and was observed for UTA at the 2010 interval. Both the doctoral and comprehensive universities duplication rates range from 0% to 100%. The doctoral classification has a median duplication rate of 50%, while the comprehensive classification has a median rate of 66%. The range of duplication rates observed among doctoral and comprehensive universities speaks to the nature of the program dabbling mentioned previously. It is quite easy to have a duplication rate of 0% or 100% when an institution only has a single doctoral program; the program is then either duplicated or not. Because of this, duplication level and ranges are far less meaningful for these institutional classifications than they are for the research and emerging research classifications and comparisons between the classifications losses its relevance. This problem of comparing data from the various institutions and institutional classifications is also a limitation for the inferential analysis of program duplication rates.

Because a number of the institutions had three or fewer duplication rate observations, regression analysis could not be conducted for all of the 22 institutions within the research, emerging research, doctoral and comprehensive institutional classifications. Regression analysis could only be conducted on 18 out of the 22 institutions and only 13 of these cases had the full five observations. When simple OLS analysis was conducted on the duplication rates of the 18 institutions, the model was found to be a poor fit for seven (39%) of the institutions as evidenced by the negative adjusted R^2 score. The duplication rates for these institutions are not correlated with time. Most of these institution, four out of the seven, are clustered in the doctoral institutional classification, more evidence of doctoral program dabbling. Program dabbling affected the comprehensive universities to such an extent that regression could only be conducted for three out of the seven institutions and one of those institutions has a negative adjusted R^2 score.

Of the 11 institutions with duplication rates correlated with time, three (17%) were found to have program duplication rates increase significantly across time (all at $p < .05$). The rate of change for these three institutions is .03% or less per five year interval. Some of the other institutions that did not have significant rates of change actually have higher rates of change. Of those institutions that did not have significant rates of change, seven were found to have changes positively correlated with time and one was found to

Table 5.20 Simple OLS Analysis Results for Doctoral Level Duplication Rates

Institution	Constant	Coefficient (t statistic)	Adjusted R^2	F	Significance of Model
		Research Universities			
TAMU	-15.28	.008* (4.326)	0.816	18.718	0.023
UT	-6.678	.004 (1.578)	0.272	2.491	0.213
		Emerging Research Universities			
TTU	-5.269	.003 (.964)	-0.018	0.929	0.406
UNT	-28.543	.015* (5.346)	0.873	28.58	0.013
UTA	-11.526	.006 (1.481)	0.23	2.193	0.235
UTD	-27.975	.014 (3.040)	0.673	9.24	0.056
UTEP	7.31	-.003 (-.460)	-0.246	0.211	0.677
UTSA[1]	-23.186	.012 (1.953)	0.484	3.814	0.19
		Doctoral Universities			
SHSU	-12.669	.007 (.226)	-0.311	0.051	0.836
TAMUCC[1]	31.615	-.015 (-3.507)	0.79	12.297	0.073
TAMUCM	-3.02	.002 (.138)	-0.325	0.019	0.899
TAMUK	-29.6	.015 (.792)	-0.103	0.628	0.486
TWU	-24.494	.012 (1.919)	0.402	3.683	0.151
TX Southern	5.154	-.002 (-.402)	-0.265	0.161	0.715
TX State[2]	-20.017	.010 (1.732)	0.5	3	0.333
		Comprehensive Universities			
Lamar	-56.131	.028* (4.491)	0.827	20.165	0.021
PVAM[2]	-99.917	.050 (1.732)	0.5	3	0.333
SFA[3]	NA				
TAMIU[4]	NA				
Tarleton[3]	NA				
UTPA[1]	7.389	-.003 (-.146)	-0.484	0.021	0.897
WTAMU[4]	NA				
		Master's Universities			
Angelo[5]	NA				
Midwestern[5]	NA				
UTB[6]	NA				
UTT[6]	NA				

Note: * significant at < .05; ** significant at < .01; *** significant at < .001
[1] Analysis based on four observations
[2] Analysis based on 3 observations
[3] Three observations exist, but analysis could not be conducted because each observations is identical
[4] Two observations, analysis not conducted
[5] Institution did offer any doctoral programs during the study time period
[6] Institution only offered doctoral program(s) during the 2010 interval

have its rate of change negatively correlated with time. Table 5.20 contains the details from the analysis of doctoral level program duplication rates for most institutions.

In summary, the descriptive data indicates that only half (50%) of the institutions' had average annual percent increase in program duplication rates. Like with the master's programs, it is difficult to suggest that this constitutes a trend toward doctoral program homogenization; however, unlike the master's programs, 64% of the institutions (as opposed to 50% in master's programs) had average annual percent increases in duplicated programs. Further, UTB and UTT, institutions not considered in the program duplication and duplication rate counts, added three doctoral programs between them that were observable in the 2010 interval and two of those programs are duplicates of programs already being offered in at least one of the other institution. The moderately high proportion of institutions that are adding duplicated programs may be an early indicator of a budding trend towards increasing homogenization. The duplication levels and ranges provide little insight into the state of homogeneity because, as mentioned previously, limitations in the number of programs for several institutions preclude reasonable comparisons between the institutional classifications. The inferential findings indicate that only 42% of the institutions' duplication rates are increasing over time and this includes the two institutions that had significant rates of increase. This partially supports the descriptive findings in that it does not suggest a trend towards homogenization. The small program duplication rates of change revealed through the inferential analysis ensures that any budding trend in homogenization would progress at a very slow pace. The findings from the descriptive and inferential analysis clearly indicate that the institutions are not becoming more alike as there are a sizable proportion of them with decreasing program duplications and duplication rates, thus the null hypothesis must also be rejected for doctoral level programs.

5.1.2.1.5 Summary of program duplication findings

As the preliminary results suggested, there is evidence to indicate a trend towards programmatic homogenization. The descriptive findings offer the strongest degree of support towards a trend as at least half of the institutions at all degree levels and within individual degree levels had average annual percent increases in duplicated programs. This is also the case for program duplication rate as at least half of the institutions at all degree levels combined and individual degree levels had average annual percent increases. The inferential findings also indicate a trend toward programmatic homogenization when all degree levels are combined and for bachelor and doctoral programs, but not for master's programs. Over half or more of the institutions for all degree levels, bachelor and doctoral programs had program duplication rates that increased over time. Less than half of the institutions at the master's level had program duplication rates that increase over time. The proportion of institutions with duplication rates that increased significantly over time is much smaller with none greater than 20%. Table 5.21 shows the percent of institutions with average annual percent increases in duplicated program numbers and program duplication rates as well as the percent of institutions with duplication rates that increased and significantly increased over time.

It is important to note that the percent of institutions with program duplication rates that increased significantly over time may be overstated because of the nature of autocorrelated data; however, since the coefficients are unbiased by this, the percent of institutions that have program duplication rates that increase over time, regardless of significance, can be confidently maintained. Another factor that must be mentioned with regard to the inferential data is size of the rates of change. The rates of change are very small, none greater than .05% and most much smaller. The size of the change for institutions with significant increases in duplication rates is no greater on average than institutions that did not have significant increases in duplications rates. So, any trend revealed by the data would be very slow in progressing.

Table 5.21 Summary of Descriptive and Inferential Findings for Program Duplications

	Average Annual Percent Change		Simple OLS Analysis		
	Increase in Duplicated Programs	Increase in Duplication Rate	Rates Increased Over Time	Rates Increased Significantly Over Time	Total Rates Increased Over Time
	Percent of Institutions				
All Levels	62%	69%	50%	12%	62%
Bachelor	50%	69%	54%	8%	62%
Master's	50%	54%	35%	8%	42%[1]
Doctoral	64%	50%	39%	17%	56%

[1] Total does not equal the other two factors due to rounding

The presence of a trend toward programmatic homogenization supports the predictions of mimetic isomorphic change. However, closer inspection of the programming patterns among the bachelors and master's programs reveals that the institutional classifications most likely and capable of mimicking programming are, in large part, not doing so. The majority of institutions within the emerging research, doctoral and comprehensive institutional classifications at the bachelor level and the institutions with the doctoral and comprehensive institutional classifications at the master's level were found to have decreased their duplicated programs. This is in contrast to what would be expected from mimetic isomorphic change. At the doctoral program level, mimetic isomorphism could be occurring. There was nothing in the programming patterns to suggest that the institutions are not mimicking the programs of the successful/research institutions. In fact the duplication rate ranges among the doctoral and comprehensive classifications that extend to 100% strongly suggest that mimetic isomorphic change could be occurring at this level.

The descriptive and inferential data indicate that a slight to moderate majority of institutions have programming that is homogenizing, but there are at each degree level at least a third to half of the institutions that do not have increasing program duplications and program duplication rates. The program duplication levels and ranges for the institutional classifications highlight, at each degree level, that there is still distinction between the classifications in terms of the proportion of programs typically duplicated. These two points apply to all degree levels combined as well as the individual degree levels and are the reason that the null hypothesis was rejected for each aspect of the analysis for program duplications.

5.1.2.2 Proportion of Graduate Level Programs

5.1.2.2.1 Master's programs

Examination of each institution's master's level programs reveals that 88% of the institutions had an average annual percent increase in the proportion of master's programs out of total number of programs. The other 12% of institutions had an average annual percent decrease in their proportion of master's level programs. The average annual percent change in program proportions resulted from one of three patterns of programming; 1) average annual percent increase in total program number and master's program numbers, 2) average annual percent decrease in total program number and increase in master's program number, and 3) average annual percent decrease in total program number and master's program number.

The first programming pattern resulted in 13 institutions (50%) having an average annual percent increase in their proportion of master's programs and one institution (4%) having a decrease in their proportion of master's programs. The second programming pattern resulted in three institutions (12%) having an average annual percent increase in their proportion of master's level programs. The third programming pattern resulted in seven institutions (30%) having an average annual percent increase in their proportion of master's programs and two institutions (8%) having a decrease in their proportion of master's programs. Table 5.22 shows the proportion of master's level programs for each institution as well as the average annual percent changes in total program number, master's programs and master's program proportions. The table is organized by institutional classification.

Table 5.22 Proportions of Master's Programs

	Proportion of Master's Level Programs					Average Annual Percent Change		
Institution	1990	1995	2000	2005	2010	All Programs	Master's Programs	Master's Proportion
Research Universities								
TAMU	37%	37%	38%	39%	39%	0.48%	0.73%	0.22%
UT	36%	37%	37%	38%	37%	0.56%	0.86%	0.27%
Emerging Research Universities								
TTU	33%	35%	37%	38%	39%	-0.15%	0.82%	1.01%
UNT	44%	47%	48%	48%	43%	-2.11%	-2.17%	-0.10%

Table 5.22 – Continued

UTA	36%	37%	37%	42%	43%	-0.48%	0.32%	0.89%
UTD	38%	39%	42%	41%	42%	1.26%	1.93%	0.54%
UTEP	43%	47%	47%	45%	47%	0.81%	1.32%	0.44%
UTSA	53%	45%	46%	44%	42%	2.13%	0.63%	-1.05%
Doctoral Universities								
SHSU	38%	46%	44%	37%	39%	-1.42%	-1.28%	0.19%
TAMUCC	30%	35%	40%	36%	40%	3.51%	6.43%	1.71%
TAMUCM	34%	42%	42%	39%	41%	-1.94%	-1.27%	1.09%
TAMUK	41%	42%	47%	48%	47%	-1.24%	-0.68%	0.75%
TWU	39%	42%	42%	43%	41%	-2.56%	-2.46%	0.21%
TX Southern	39%	35%	34%	35%	33%	-2.07%	-2.59%	-0.87%
TX State	31%	39%	43%	43%	44%	0.12%	2.30%	2.13%
Comprehensive Universities								
Lamar	30%	34%	32%	31%	31%	-0.89%	-0.76%	0.15%
PVAM	45%	47%	47%	50%	48%	-1.59%	-1.38%	0.31%
SFA	28%	34%	40%	38%	38%	-0.39%	1.16%	1.69%
TAMIU	41%	48%	45%	44%	45%	5.00%	6.15%	0.58%
Tarleton	22%	24%	23%	24%	24%	0.84%	1.39%	0.47%
UTPA	30%	36%	41%	44%	44%	1.65%	4.60%	2.22%
WTAMU	34%	33%	33%	35%	36%	-1.16%	-0.92%	0.31%
Masters Universities								
Angelo	34%	35%	35%	40%	39%	0.48%	1.20%	0.66%
Midwestern	23%	34%	36%	34%	36%	0.48%	3.53%	2.78%
UTB	27%	41%	34%	37%	37%	5.61%	9.44%	1.81%
UTT	36%	40%	41%	43%	48%	1.00%	2.90%	1.59%

Note: Total program numbers and master's program numbers can be found in Tables 5.9 and 5.15 respectively.

Overall, 65% of the institutions had average annual percent increases in master's programs. The doctoral institutional classification is the only group where the prevalent pattern of program change, for four out of the seven institutions, was both a decrease in total program number and decrease in master's program number. However, for six out of seven of the institutions, this resulted in an average annual percent increase in master's program proportions. The comprehensive group has equal number of institutions, three out of seven, where the total program numbers and master's program numbers increase and where the total number of programs decreased and master's program numbers decreased. All of the comprehensive universities had an average annual percent increase in master's proportions. The other institutional classifications were characterized by an increase in total program number and increase in master's program numbers. Although the proportion of master's programs did increase for most of the doctoral and comprehensive universities, it is clear these institutions, especially those within the doctoral group, were not increasing their master's level programming. Like with master's level program duplications, this is counter to the predictions of mimetic isomorphic change as the theory would predict an increase of master's level programming, especially among institutions at the doctoral level as they have the capacity to do so.

Although there is some distinction in programming patterns, the proportion levels and ranges are less distinct between institutional classifications. The least variability in range of master's proportions is observed among the research universities, where the proportions of master's programs out of total programs range from 36% to 39% with a median proportion of 37%. There is overlap in master's proportion ranges for the emerging research and doctoral universities. The emerging research universities' proportions range from 33% to 53% and the doctoral universities proportions range from 30% to 48% with median proportions of 42% and 40%, respectively. There is also overlap between the comprehensive and master's universities' proportions. The comprehensive universities proportions range from 22% to 50% and the master's universities range from 23% to 48% with a median proportion of 36% for both groups. A simple inspection of proportions of master's programs for all the institutions shows that most have proportions within the 30% to 40% range and there are few extremes on the low or high ends. The proportions of master's programs are increasing over time for most institutions, but most of the institutions have very similar proportions, so the institutions are not becoming like another so much as they are remaining like one another.

Simple OLS analysis was used to determine if changes in the proportion of the master's programs were correlated with time and if those correlations were statistically significant. The results of the analysis for each institution were compared to the result from the other institutions within the study to determine if the institutions are becoming more alike. The model was a poor fit for 6 (23%) of the institutions as indicated by the negative adjusted R^2 score. The proportion of master's programs for these institutions was not correlated with time. These institutions are evenly dispersed among the three middle institutional classifications.

The remaining 20 institutions (77%) were found to have change in master's program proportions that were correlated with time. Eighteen of those institutions (69%) had proportions that increased over time and six among those (23%) have proportions that were significantly correlated with time (three at $p < .05$ and three at $p < .01$). The two remaining institutions (8%) had proportions that decreased over time, while one of the institution's proportions was significantly correlated with time ($p < .05$). The two institutions with master's proportions that decreased over time are found in the emerging research and doctoral institutional classifications. The emerging research classification has a high concentration of institutions with master's proportions that changed significantly over time. Out of the six institutions within this group, two were found to have proportions uncorrelated with time while the remaining four had proportions significantly correlated with time; three increased significantly and one decreased significantly. The other institutions (three of them) with significantly correlated proportions were found evenly among the research, comprehensive and master's institutional classifications. It seems as a group, the emerging research institutions were making consistent efforts to build their inventories of master's level programs. This also seems to be the case for the master's institutions as all four within that group had proportions increase across time, but only one institution had proportions that were significant. Of note, the institutions with significant increases in proportions have rates of change that are generally no greater than those institutions that have proportions that are only correlated, but not significantly, with time. Significant rates of change range from .001% to .007%. So, the institutions with significant rates of change are not increasing their proportions of master's program at any appreciable amount greater than the other institutions or any appreciable amount period. Table 5.23 contains the details of the OLS analysis of master's level program proportions.

Table 5.23 Simple OLS Analysis Results for Master's Proportions

Institution	Constant	Coefficient (t statistic)	Adjusted R^2	F	Significance of Model
Research Universities					
TAMU	-1.485	.001** (6.022)	0.898	36.265	0.009
UT	-1.854	.001 (2.687)	0.609	7.217	0.075
Emerging Research Universities					
TTU	-6.210	.003** (9.009)	0.952	81.16	0.003
UNT	0.701	.0001 (-.075)	-0.331	0.006	0.945

Table 5.23 – Continued

UTA	-6.739	.004* (3.649)	0.755	13.318	0.036
UTD	-3.751	.002* (3.480)	0.735	12.113	0.04
UTEP	-1.637	.001 (.979)	-0.011	0.958	0.4
UTSA	9.785	-.005* (-3.311)	0.714	10.965	0.045
Doctoral Universities					
SHSU	2.956	-.001 (-.428)	-0.256	0.184	0.697
TAMUCC	-8.270	.004 (2.491)	0.566	6.207	0.088
TAMUCM	-4.514	.002 (1.197)	0.098	1.434	0.317
TAMUK	-6.787	.004 (2.856)	0.641	8.157	0.065
TWU	-1.329	.001 (.707)	-0.143	0.499	0.531
TX Southern	5.950	-.003 (-2.958)	0.66	8.752	0.06
TX State	11.489	.006 (2.973)	.662	8.837	0.059
Comprehensive Universities					
Lamar	1.056	-.0004 (-.320)	-0.289	0.103	0.770
PVAM	-3.014	.002 (1.689)	0.300	2.715	0.198
SFA	-8.846	.005 (2.256)	0.506	5.091	0.109
TAMIU	-1.961	.001 (.693)	-0.150	0.48	0.538
Tarleton	-1.539	.001 (1.856)	0.379	3.446	0.16
UTPA	-13.756	.007* (5.196)	0.867	26.995	0.014
WTAMU	-2.297	.001 (2.077)	0.453	4.314	0.129
Master's Universities					
Angelo	-5.042	.003 (3.095)	0.682	9.578	0.054
Midwestern	-10.041	.005 (2.081)	0.454	4.331	0.129
UTB	-6.243	.003 (1.052)	0.026	1.17	0.37
UTT	-10.134	.005** (7.412)	0.931	54.936	0.005

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

The descriptive findings suggest there is a trend toward increasing master’s proportions in relation to total programs as 88% of institutions had an increase in their proportions. Further supporting this, although not as strongly, is that 65% of institutions had an average annual percent increase in master’s program numbers. Increasing homogenization of master’s level program proportions supports the predications of mimetic isomorphic change; however, the programming patterns that are prevalent among the doctoral and comprehensive institutional classifications are in contrast to what would be expected if mimetic isomorphic forces were at work. Tempering also the strength of the descriptive findings toward a trend in homogenization and providing some insight as to why preliminary findings from the analysis of all institutions as a single group was found to be insignificant are the proportion level and range data. This data indicates that there is not as much variability within and between institutional classifications as that seen, for instance, with program duplications. This suggests that although the institutions are adding proportionately more master's programs, they are not becoming more alike in the process; they are maintaining their like status.

The inferential findings also suggests there is a trend toward increasing proportions of master's level programs as 69% of the institutions' proportions were found to be increasing over time, 23% of which were statistically significant. The strength of this evidence is weakened by the rates of change among the institutions with significantly correlated proportion increases. The rates of change for those institutions are extremely small and nearly indistinguishable from those institutions where the proportions are only correlated with time. Any trend toward increasing proportions is going to move very slowly at best.

In sum, although there is strong evidence suggesting a trend toward increasing master's level proportions and thus increasing homogenization of the institutions in terms of their proportions of master's level programs, there are institutions that have master's program proportions that are either not correlated with time or whose correlations and significant correlations that are decreasing over time. Further, the majority of institutions within the doctoral institutional classification as well as a sizable fraction of those within the comprehensive institutional classification that had an average annual percent decrease in master's program numbers. These two points are the most compelling evidence that not all of the institutions are moving in a direction toward increasing homogenization of master's level program offerings and, thus, the null Hypothesis 1s rejected.

5.1.2.2.2 Doctoral programs

As discussed previously, not all institutions offered doctoral programs during the study time period and those that did may not have offered them during each of the five, five-year intervals. To reiterate, Angelo and Midwestern did not offer any doctoral programs during the study time period. Of the other 24 institutions, almost half (11) did not offer doctoral programs for at least one of the five, five-year intervals and UTB and UTT did not offer doctoral programs until the 2010 interval. Examination of each of the 22 institutions that offered doctoral programs during at least two intervals reveals that 12 institutions (55%) had average annual percent increases in their proportion of doctoral programs.[22] Forty-one percent (41%) had an average annual percent decrease in their proportion of doctoral programs and one institution (5%) had no change in the proportion of doctoral programs.

The average annual percent change in doctoral program proportions resulted from one of seven patterns of programming; 1) an average annual percent increase in total program number and doctoral programs, 2) an average annual percent increase in total program number and decrease in doctoral programs, 3) an average annual percent

[22] An average annual percent change increase could not be calculated for UTB and UTT because each institution only offered doctoral programs during the last interval of the study period, but if they were to be included in this count, it would increase to 58%.

decrease in total program number and increase in doctoral programs, 4) an average annual percent decrease in total program number and doctoral programs, 5) an average annual percent decrease in total program number and no change in doctoral programs, 6) an average annual percent increase in total program number and no change in doctoral programs, and 7) no change total program number and no change in doctoral programs.

The first programming pattern resulted in five institutions (23%) having an average annual percent increase in their proportion of doctoral programs and two institutions (9%) having a decrease in their proportion of doctoral programs. The second programming pattern resulted in one institution (5%) having an average annual decrease in their proportion of doctoral programs. The third programming pattern resulted in six institutions (27%) having an average annual percent increase in their proportion of doctoral programs. The fourth programming pattern resulted in four institutions (18%) having a decrease in their proportion of doctoral programs. The sixth programming pattern resulted in two institutions (9%) having an average annual percent decrease in their proportion of doctoral programs. Finally, the seventh programming pattern resulted in one institution having no change in their proportion of doctoral programs. Table 5.24 shows the proportion of doctoral level programs for each institution as well as the average annual percent changes in total program number, doctoral programs and doctoral program proportions. The table is organized by institutional classification. The total number of programs for each institution can be found in table 5.9 and total number of doctoral programs can be found in table 5.18.

Table 5.24 Proportions of Doctoral Programs

Institution	Proportion of Doctoral Programs 1990	1995	2000	2005	2010	Average Annual Percent Change All Programs	Doctoral Programs	Doctoral Proportion
Research Universities								
TAMU	26%	25%	25%	24%	25%	0.48%	0.28%	-0.19%
UT	32%	32%	30%	29%	29%	0.56%	-0.04%	-0.54%
Emerging Research Universities								
TTU	19%	19%	19%	20%	20%	-0.15%	0.18%	0.34%
UNT	25%	23%	20%	20%	19%	-2.11%	-2.75%	-1.11%
UTA	14%	15%	16%	19%	16%	-0.48%	0.16%	0.71%
UTD	26%	27%	25%	25%	22%	1.26%	0.17%	-0.87%
UTEP	1%	4%	6%	8%	9%	0.81%	40.00%	33.70%
UTSA		2%	3%	12%	13%	2.17%	66.67%	48.65%
Doctoral Universities								
SHSU	<.5%	1%	2%	3%	4%	-1.42%	25.00%	36.88%
TAMUCC		2%	3%	8%	6%	2.69%	26.67%	17.08%
TAMUCM	10%	4%	3%	3%	3%	-1.94%	-3.97%	-3.31%
TAMUK	<1%	2%	2%	4%	4%	-1.24%	15.00%	21.61%
TWU	17%	15%	12%	14%	15%	-2.56%	-2.87%	-0.63%
TX Southern	5%	6%	6%	7%	8%	-2.07%	0.00%	3.55%
TX State			1%	3%	5%	0.82%	40.00%	36.21%
Comprehensive Universities								
Lamar	4%	1%	2%	3%	3%	-0.89%	-1.67%	-0.95%
PVAM			1%	4%	5%	-2.54%	30.00%	43.64%
SFA			<1%	1%	2%	-0.54%	5.00%	5.85%
TAMIU				2%	2%	0.98%	0.00%	-0.94%
Tarleton			1%	1%	1%	0.32%	0.00%	-0.31%
UTPA		3%	3%	3%	4%	1.50%	2.22%	0.59%
WTAMU				<1%	<1%	0.00%	0.00%	0.00%
Masters Universities								
Angelo								
Midwestern								
UTB					1%	NA	NA	NA
UTT					2%	NA	NA	NA

Note 1: Blank space indicates doctoral programs not offered.

Note 2: Total program numbers and doctoral program numbers can be found in Tables 5.9 and 5.18, respectively.

Overall, 65% of the institutions added doctoral programs, but none of the institutional classifications are strongly characterized by a particular programming pattern. The patterns for both of the research institutions differ; TAMU increased total programs and doctoral programs, while UT increased total programs, but decreased doctoral programs. Both institutions had a decrease in doctoral program proportions. The prevalent programming pattern for emerging research institutions was to add total programs and doctoral programs, but this was only shared among three of the six institutions. Four of the six institutions did have an average annual percent increase in doctoral proportions. Neither the doctoral institutions nor the comprehensive institutions were characterized by a single programming pattern; however, most of the doctoral institutions, four out of seven, had an increase in doctoral proportions, while most of the comprehensive institutions, four out of seven, either had a decrease or no change in doctoral proportions.

The institutions and institutional classifications differ in program duplication rate levels and ranges as well. The research institutions have doctoral proportions that range from 24% to 32% with a median rate of 27%. The emerging research institutions have proportions that range from 1% to 27% with most institutions having rates above 15% and the group having a median rate of 19%. The doctoral institutions have proportions that range from less than .5% to 17% and a median rate of 4%. Most of the institutions in this group have proportions that fall well under 10%. The comprehensive universities have proportions that range from less than 1% to 5% with a median rate of 2%. The ranges make it very clear that only the research and emerging research institutions actually have appreciable amounts of doctoral programs. The doctoral and comprehensive institutions are, as was noted previously, dabbling in doctoral programming. The exception to this is TWU, which has proportions that align more closely with the institutions in the emerging research group. The proportions of the research and emerging research institutions are distinct as are their median rates.

Simple OLS analysis was used to determine if changes in the proportion of the doctoral programs were correlated with time and if those correlations were statistically significant. Because four institutions had two or fewer proportion observations, regression analysis could not be conducted for all of the institutions within the comprehensive and master's institutional classifications. Regression analysis could only be conducted on 20 of the 24 institutions that offered doctoral programs and only 13 of these cases had the full five observations. When analysis was conducted on the doctoral proportions of the 20 institutions, the model was found to be a poor fit for four (20%) of the institutions as evidenced by the negative adjusted R^2 score. The duplication rates for these institutions are not correlated with time. Most of these institutions, three out of the four, are clustered in the comprehensive institutional classification and two of these institutions did not have the full five observations. The other institutions with proportions that are not correlated with time are found in the doctoral classification.

The remaining 16 institutions (80%) were found to have changes in doctoral program proportions correlated with time. Eleven of those institutions (55%) had proportions that increased over time and six among those (30%) have proportions that were significantly correlated with time (four at $p < .05$, one at $p < .01$, and one at $p <$

.001). The five remaining institutions (25%) had proportions that decreased over time and three of the institutions' proportions were significantly correlated with time (two at $p < .05$ and one at $p < .01$). The institutions with significant proportions are found in the research, emerging research and doctoral institutional classifications. The rates of change for institutions with significant rates range from .001% to .004%. These rates are no greater in size than the rates for the other institutions that did not have significant rates and, in fact, are smaller in some cases. So, like the master's proportions, institutions with significant rates of change are not increasing their proportions of doctoral programs in any appreciable amount greater than the other institutions. Table 5.25 contains the details of the simple OLS analysis for doctoral level proportions.

The descriptive evidence does suggest there is a trend toward increasing proportions of doctoral level programs, although not as strongly as is the case with master's programs. Fifty-five percent (55%) of institutions had an average annual percent increase in doctoral proportions and 64% had an average annual percent increase in doctoral program numbers. All but one of the emerging research institutions had increased program numbers and over half of the doctoral institutions had increased doctoral program numbers. Almost half of the comprehensive institutions had an average annual percent increase in their doctoral proportions. It is also notable that half of the master's institutions began to offer doctor programs during the study time period. The increases in program proportions and program numbers support the predictions of mimetic isomorphism that institutions will pursue the practices of successful/research institutions such as offering doctoral programs. This seems especially poignant when the duplications for the doctoral and comprehensive institutions range up to 100%.

Table 5.25 Simple OLS Analysis Results for Doctoral Proportions

Institution	Constant	Coefficient (t statistic)	Adjusted R^2	F	Significance of Model
Research Universities					
TAMU	1.576	-.001 (-1.944)	0.41	3.78	0.147
UT	4.314	-0.002* (-5.697)	0.887	32.46	0.011
Emerging Research Universities					
TTU	-1.402	.001* (3.656)	0.756	13.369	0.035
UNT	5.953	-.003** (-6.482)	0.911	42.012	0.007
UTA	-3.132	.002 (1.605)	0.283	2.576	0.207
UTD	4.748	-0.002* (-3.326)	0.715	11.06	0.045
UTEP	-8.101	.004*** (13.700)	0.979	187.7	0.001
UTSA[1]	-17.194	.009 (3.758)	0.814	14.125	0.064
Doctoral Universities					
SHSU[1]	-3.927	.002** (7.061)	0.924	49.854	0.006
TAMUCC[1]	-7.181	.004 (2.390)	0.611	5.714	0.139
TAMUCM	5.634	-.003 (-2.185)	0.485	4.773	0.117
TAMUK	-3.183	.002* (5.684)	0.887	32.313	0.011
TWU	2.04	-.001 (-.684)	-0.153	0.468	0.543
TX Southern	-2.881	.001* (3.622)	0.752	13.12	0.036
TX State[2]	-7.417	.004* (54.801)	0.999	3003.167	0.012
Comprehensive Universities					
Lamar	-0.113	.00007 (.089)	-0.33	0.008	0.935
PVAM[2]	-7.384	.004 (3.530)	0.851	12.463	0.176
SFA[2]	-1.558	.001 (2.683)	0.756	7.199	0.227
TAMIU[3]	NA				
Tarleton[2]	0.077	.00003 (-.279)	-.855	.078	0.827
UTPA[1]	-0.304	.0002 (.292)	-.372	.186	0.708
WTAMU[3]	NA				
Master's Universities					
Angelo[4]	NA				
Midwestern[4]	NA				
UTB[5]	NA				
UTT[5]	NA				

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

[1] Analysis based on four observations

[2] Analysis based on three observations

[3] Two observations, analysis not conducted

[4] Institution did not offer any doctoral programs during the study time period

[5] Institution only offered doctoral program(s) during the 2010 interval

The inferential data also suggests there is a trend toward increasing doctoral program proportion homogeneity to about the same extent as the descriptive data. Fifty-five percent (55%) of the institutions were found to have the doctoral proportion of total programs increase over time and 30% of those increased significantly. The rates of change, however, like with program duplications and master's proportions, are extremely small. So, any trend of doctoral proportion homogeneity that may be taking shape is likely to progress quite slowly.

Although there is some descriptive and inferential evidence to support a trend toward increased doctoral proportion homogenization and the assertions of mimetic isomorphic change, the descriptive data reveals that a sizable portion of the institutions are not increasing their doctoral proportions. These institutions are either decreasing their doctoral proportions or maintaining their doctoral proportion levels. Further, the inferential data reveals that 45% of the institutions have either proportions that are not correlated with time or are decreasing over time. These findings make clear that not all of the institutions are becoming more alike. The doctoral proportion levels and ranges also highlight that many institutions have very small, almost negligible percentages of total programs of doctoral programs. Finally and perhaps what might be the most convincing evidence that all the institutions are not becoming more like one another is that two institutions did not offer any doctoral programs during the study time period. It is for all these reasons that the null hypothesis must be rejected.

5.1.2.2.3 Summary of graduate level program proportion findings

The descriptive and inferential findings from the analyses of both master's and doctoral program proportions suggest a trend toward an increase in proportions for each level, though evidence from the master's level appears stronger. Almost 90% of the institutions had average annual percent increases in their master's program proportions and 65% of institutions had average annual percent increases in their number of master's programs. The inferential data supports these findings in 69% of institutions had master's program proportions that increased over time, but only 23% of institutions increases were significant. A little over half (55%) of the institutions had average annual percent increases in their doctoral proportions and 64% of institutions had average annual percent increases in doctoral program numbers. The inferential data indicated that 55% of the institutions had master's proportions that increased over time and 30% of institutions had significant increases over time. Table 5.26 contains summary metrics for each degree level for average annual percent increases in program numbers and program duplications as well as for program proportions that increased and significantly increased over time.

Table 5.26 Summary of Descriptive and Inferential Findings for Graduate Program Proportions

	Average Annual Percent Change		Simple OLS Analysis		
	Increase in Programs	Increase in Program Proportion	Proportions Increased Over Time	Proportions Increased Significantly Over Time	Total Proportions Increased Over Time
	Percent of Institutions				
Master's	65%	55%	25%	30%	55%
Doctoral	65%	88%	46%	23%	69%

As the descriptive and inferential data shows, there is a tendency toward an increase in graduate level proportions and this lends support to the tenets of mimetic isomorphic change as under the predictions of the theory, institutions will mimic the practices of the successful/research institutions. As graduate education is a hallmark for research institutions, then it is expected that institutions would increasingly offer graduate programs. Although the data from the master's analysis appears to most strongly support mimetic isomorphic change for graduate programs, detailed inspection of programming patterns indicate that the majority of institutions within doctoral and comprehensive classifications actually had average annual percent decreases in their number of master's programs, thus indicating that something other than mimetic isomorphic forces may be at work. A detailed inspection of master's proportions for all the institutions revealed that there is little variability in proportions between institutions and institutional classifications. This suggests that the institutions are not necessary becoming more alike, but that they are maintaining their likeness. This may also be why the preliminary findings for master's proportions were found to be insignificant when the data for all institutions were combined as a single group. Another factor common to both the master's and doctoral findings are the small rates of change calculated through simple OLS analysis. The size of the changes are so small that any trend toward increasing proportions of graduate programs has been and will likely be very slow to progress.

While there is data to support a trend toward increasing graduate program proportions, the null hypothesis was rejected for both master's and doctoral programs. At both levels, one of the most compelling pieces of evidence used to refute the null was that not all of the institutions are programming in the same direction. There are institutions at each level that are decreasing, rather than increasing graduate programs regardless of whether this is reflected in the proportions or not. This is especially obvious among the doctoral and comprehensive institutions at the master's level. For doctoral programs, the institutions beyond the emerging research group are offering minuscule amounts of programs. Further, there are two institutions within the master's classification that did not offer doctoral programs during the study time period.

5.1.2.3 Research Expenditures

Examination of the 26 institutions within the study reveals that the overwhelming majority of institutions, 92%, had average annual percent increases in their research expenditures. The institutions do differ, however, in the average amount spent per year as well as the amount increasingly spent per year. The two research institutions, TAMU and UT, spend far and away more than any other institution. Their expenditures from FY90 to FY10 average in the six figures at $175,850 and $144,143 respectively. Both have average annual increases over $3,500 per year. The emerging research institutions spend far less per year, an average of $27,000 to $75,000. The change in expenditures per year ranges from $90 to $3.600. UTD spends the most within this group at an average of $75,000 per year and their expenditures increased by an average of $3600 per year. UNT stands out among the emerging research group as the institution with the lowest average expenditures per year at almost $17,000 per year and the lowest average annual increase per year at $90.

The doctoral universities spend per year an average of $2,800 to $28,000 with average annual changes in expenditures that decreased and ranged up to increases of almost $2,000 per year. TAMUCC and TAMUK stand out among the institutions within this group as they both spent on average more than $25,000 per year. These two institutions also have some of the higher increases in expenditures per year. Although TX State did not have expenditures as high as either TAMUCC or TAMUK, they did have the second highest average annual increase in expenditures at almost $1,700 per year. TAMUCM also stands out among the doctoral group because they spend on average only $2,800 per year with an average increases of only about $300 per year. TWU probably stands out the most among the doctoral group because their average annual research expenditures have been decreasing by about $35 per year. The doctoral institutions can be viewed as two sub-groups, those that are increasing expenditures at rates in the low end of the emerging research group and those that increased spending by very minimal amounts, all less than $500 per year.

The comprehensive institutions spend on average $4,500 to $37,000 per year with average annual increases that range from a mere $7 per year up to $1,400 per year. There is only one institution with the group that spent in the $30,000 range and that is PVAM. The next highest spender, Tarleton, only spent about $21,000 per year. The other institutions spent less than $15,000 per year. Similar to the doctoral group, the biggest spender is not the biggest increaser. PVAM only had average expenditure increases of $750 per year, while Tarleton had the largest increases per year of $1,400. Most institutions increased expenditures between $450 and $950 per year. Lamar was an anomaly with their $7 per year average increase in expenditures. Interestingly, Lamar is not the lowest spender in the comprehensive group, in fact, the institutions average expenditures are right in the center of the group at about $11,000 per year. SFA is also a stand-out among the comprehensive group as their research expenditures grew by an average of 118% per year. This is due to very modest total expenditures in 1990 of $500 growing to total expenditures of almost $14,000 by 2010. As a group, the comprehensive universities have more consistent spending increases than do the doctoral universities. Although there are extremes on the high and low ends, this group does not have dichotomous sub-groups as is seen in the doctoral group.

The master’s institutions are the lowest research spenders with average annual expenditures ranging from $500 to almost $9,000. Midwestern, the institution with the lowest average expenditures at $500 per year also has the lowest increase per year as they are on average increasing their expenditures by $0 per year. Midwestern is also one of the two institutions that had an average annual percent decrease in expenditures. UTB had the highest amount of expenditures at about $8,700 per year. UTB also had the largest increase in expenditures by about $900 per year. UTB also had an enormous average annual percent increase in research expenditures at 272%. This is because their expenditures in 1990 were quite small at about $300 total and by 2010 the expenditures total almost $20,000.

The average annual percent increases and decreases are not as meaningful in the context of research expenditures as are the average expenditures and average annual increases in expenditures. The research universities have increased their spending by an average of 2% to 4%. The emerging research universities increased expenditures by an average of less than 1% up to 16% per year. The doctoral universities' expenditures ranged from a decrease in expenditures up to an average increase of 66% per year. The comprehensive institutions increased expenditures by an average of less than 1% up to 118% per year. Finally the master's universities' expenditures ranged from a decrease in expenditures up to an average increase of 272% per year. What can be gleaned from the range of percent changes is that some institutions have increased their expenditures greatly, while other institutions, including the research institutions have had minimal growth in expenditures. Institutions with minimal growth (less than an average of 5% per year) are found in each of the institutional classifications. Aside from the research institutions, the emerging research group has the tightest range of average annual percent increases in expenditures. The ranges become more extreme the further the classification is from the research institutions classification. Table 5.27 contains the average research expenditures from FY90 to FY10 as well as the average annual percent changes in expenditures for each institution. The table of expenditures for each institution for each fiscal year is Appendix A.

Simple OLS analysis was used to determine if changes in research expenditures were correlated with time and if those correlations were statistically significant. The results of the analysis for each institutions is compared to the other institutions within the study to determine if the institutions change in research expenditures are like those of all the other instructions. The OLS model was a poor fit for 4 (15%) of the institutions as indicated by the negative adjusted R^2 score. The research expenditures for these institutions were not correlated with time. These institutions are found among the emerging research, doctoral and comprehensive universities.

Table 5.27 Average Research Expenditures for Each Institution

Institution	Average Expenditures Per Year 1990-2010	Average Annual Change in Expenditures per Year	Average Annual Percent Change
Research Universities			
TAMU	$175,850	$3,620	2.22%
UT	$144,143	$4,008	4.09%
Emerging Research Universities			
TTU	$37,902	$2,693	10.05%
UNT	$16,858	$90	0.53%
UTA	$34,586	$2,218	12.02%
UTD	$74,599	$3,625	6.95%
UTEP	$46,743	$3,102	15.60%
UTSA	$27,304	$1,736	9.49%
Doctoral Universities			
SHSU	$7,612	$437	19.31%
TAMUCC	$25,842	$1,972	35.06%
TAMUCM	$2,867	$319	19.03%
TAMUK	$28,479	$1,594	13.00%
TWU	$5,658	-$35	-0.73%
TX Southern	$13,421	$277	2.77%
TX State	$13,558	$1,674	66.16%
Comprehensive Universities			
Lamar	$11,389	$7	0.07%
PVAM	$37,417	$750	3.54%
SFA	$9,895	$640	118.21%
TAMIU	$4,541	$448	45.32%
Tarleton	$20,621	$1,431	60.51%
UTPA	$8,289	$574	20.35%
WTAMU	$14,044	$951	42.74%
Master's Universities			
Angelo	$3,094	$76	2.35%
Midwestern	$505	$0	-0.03%
UTB	$8,741	$918	271.67%
UTT	$4,463	$350	10.82%

Note: All expenditures inflation adjusted to 1990 dollars

Among the remaining 22 institutions, the vast majority, 17 (65%), were found to have research expenditures that were significantly increasing over time (one at $p < .01$; 16 at $p < .001$). Of the remaining five institutions, three were found to have research expenditures that had increased across time while the other two institutions had research expenditures that decreased across time. The two institutions found to have decreases in expenditures are found among the comprehensive and master's universities.

The expenditure rates for institutions with rates of change correlated with time vary greatly across institutions and range from a decrease of $15 to an increase of $4,500. There is a good deal of difference between the two research universities rates of change, UT's expenditures are increasing by $4,500 per year while TAMU's expenditures are increasing by about $1,200 per year. The emerging research universities rates of changes range from about $1,500 to $2,800. The doctoral universities with expenditures correlated with time have rates of change that range from $180 to $2,600. The comprehensive universities with expenditures that are correlated with time range from a decrease of $97 to an increase of $1,400 per year. Finally, the master's universities rates of change range from a decrease of $15 to an increase of almost $1,400 per year. There is less distinction among the rates of change for the comprehensive and master's group than there is between the other institutional classifications. Most of the emerging research universities have rates of increase that exceed that of TAMU; however, TAMU's overall spending is so much higher than any of the emerging research universities that the trend of increasing research expenditures is not likely to see these institutions catch up to the spending of the research universities anytime in the near future without more dramatic increases in research revenue. However, the sizable rates of change ($1,000 or more per year) that are found throughout all of the institutional classifications suggest that the institutions, regardless so institutional classification are making research a priority. Table 5.28 contains the details of the simple OLS analysis for research expenditures.

Table 5.28 Simple OLS Analysis Results of Research Expenditures for Each Institution

Institution	Constant	Coefficient (t statistic)	Adjusted R^2	F	Significance of Model
		Research Universities			
TAMU	-2280748.799	1228.300 (1.804)	0.101	3.253	0.087
UT	-8758796.06	4451.469*** (13.128)	0.895	172.34	.000
		Emerging Research Universities			
TTU	-2908105.026	1473.004** (3.675)	0.385	13.504	0.002
UNT	-22567.345	19.713 (.228)	-0.05	0.052	0.822
UTA	-3759367.29	1896.977*** (7.063)	0.71	49.88	.000
UTD	-7155436.97	3615.018*** (6.803)	0.694	46.286	.000
UTEP	-5614294.5	2830.519*** (11.995)	0.877	143.888	.000
UTSA	-3878211.23	1952.758*** (8.401)	0.777	70.583	.000
		Doctoral Universities			
SHSU	-369806.725	188.709 (1.250)	0.027	1.564	0.226
TAMUCC	-5217632.316	2621.737*** (7.477)	0.733	55.903	.000
TAMUCM	-595490.686	299.179*** (6.573)	0.678	43.204	.000
TAMUK	-3288093.353	1658.286***(21.330)	0.958	454.969	.000
TWU	-65695.498	35.677 (.625)	-0.031	0.39	0.54
TX Southern	-345145.48	179.283 (1.234)	0.025	1.522	0.232
TX State	-2315270.384	1164.414*** (5.920)	0.63	35.046	.000
		Comprehensive Universities			
Lamar	206670.766	-97.641 (-1.699)	0.086	2.885	0.106
PVAM	83577.96	-23.08 (-.051)	-0.052	0.003	0.96
SFA	-1026537.093	518.216*** (5.159)	0.562	26.619	.000
TAMIU	275785.748	-135.622 (-.507)	-0.039	0.257	0.618
Tarleton	-2810930.131	1415.776*** (9.970)	0.831	99.4	.000
UTPA	-1326285.23	667.287*** (7.839)	0.751	61.443	.000
WTAMU	-2706588.162	1360.316*** (7.779)	0.748	60.515	.000
		Master's Universities			
Angelo	-226457.486	114.776*** (4.883)	0.533	23.847	.000

Table 5.28 – Continued

Midwestern	31708.95	-15.602 (-1.972)	0.126	3.89	0.063
UTB	-2736586.37	1372.66*** (6.859)	0.697	47.04	.000
UTT	-634076.13	319.804** (2.908)	0.272	8.454	0.009

Note: * significant at < .05; ** significant at <.01; *** significant at <.001

The descriptive and inferential data both strongly suggest that there is a distinct trend toward increasing research expenditures. The descriptive data reveals that 92% of the institutions had an average annual percent increase in research expenditures. The inferential data indicates that 77% of the institutions research expenditures are increasing over time. Both of these lines of evidence support the predictions of mimetic isomorphic change as institutions will mimic the practices of the success/research institutions. Lending further support are the relatively sizable rates of increase (greater than $1,000 per year) that are found throughout the institutional classifications. Research expenditures are evidence of research productivity and it is clear that most institutions are on the trajectory of increasing research productivity. However, even though there is strong evidence to indicate a trend toward homogenization of research productivity, there are still distinctions among the institutions.

As is obvious, not every institution is increasing their research productivity as evidenced by the 8% of institutions with average annual percent decreases in expenditures. Further, as the regression analysis revealed, 23% of the institutions either have research expenditures that are not correlated with time or are decreasing over time. Further tempering the trend toward homogenization of research activity is the amount being spent on average by the research institutions. Although numerous institutions have sizable rates of expenditure, even in some cases larger than one of the research institutions, catching up to the two research universities would take many, many years at the current rates of increase. Finally, the significance of the research expenditure change is likely overstated due to the nature of the autocorrelated data. This, however, does not negate that fact that the majority of the institutions research expenditures are increasing over time. In sum, there does appear to be a distinct trend toward increasing research productivity, but not all institutions are on this trajectory, so the null hypothesis must be rejected.

5.1.2.4 First-time Freshmen Acceptance Rates

Examination of the 26 institutions reveals there is a trend toward increasing selectivity as indicated by the 85% of institutions that had average annual percent decreases in their first-time, freshmen acceptance rates. Out of the remaining institutions, 12% had average annual percent increases in their acceptance rates and one institution (4%), UTB, had no change in acceptance rate because their rate of acceptance remained constant at 100%. UTB is the only institution that maintained open admissions during the 13 years studied. Four other institutions had open admissions during the first few years, but each moved away from open admissions and became more selective. There is great overlap of acceptance rate ranges for all of the institutional classifications, including the research institutions.

The research institutions' acceptance rates ranged from 50% to 90% with a median rate of 69%. The 90% rate does seem rather anomalous, however, and is the only rate that high with the next highest rate being 86%. The emerging research institutions' acceptance rates range from 48% to 100% with a median rate of 79%. The doctoral universities' acceptance rates range from 52% to 100% with a median rate of 83%. The comprehensive universities' acceptance rates range from 47% to 100% with a median rate of 88%. Finally, the master's institutions' acceptance rates range from 44% to 100% with a median rate of 92%. Table 5.29 contains the acceptance for all the institutions for each fall term from 1998 to 2010 along with the institutions' average annual percent change in acceptance rates.

Several institutions had noticeable shifts in their acceptance rates. A couple of these instances seem to be the result of the institutions becoming more selective, while others appear to be the result of erroneous data. For instance, the acceptance rates for UTD start out in the 70% range and go up a bit in the early 2000's and then continue to progress downward into the upper 40% to lower 50% range. While these rates are low for the institution's classification, they do not appear out of context when considering all of the rates for that institution. In contrast, TWU and Angelo do have shifts in acceptance rates that appear to be out of line with their other rates.

From 2000 to 2005, both TWU and Angelo had acceptance rates that are in the 40% to 60% range. Rates for the other years for TWU were in the 70% to 90% range. As for Angelo, the rates outside of the five years in question are in the 80% to 90% range. It seems more likely that this data was transposed on to these institutions than it is that both of these institutions went through a period of low acceptance rates. Further, the suspiciously low rates for Angelo affected the acceptance rate range for the master's classification. Without those rates, the range would be from 80% to 100%. The range for the doctoral classification, where TWU is located, would, however, not change

Table 5.29 First-time Freshmen Acceptance Rates of Each Institution

Institution	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Average Annual Percent Change
Research Universities														
TAMU	86%	74%	66%	69%	68%	67%	72%	70%	77%	76%	70%	67%	69%	-1.56%
UT	64%	85%	90%	77%	69%	55%	60%	59%	58%	58%	50%	50%	51%	-1.51%
Emerging Research Universities														
TTU	75%	75%	70%	74%	73%	67%	67%	72%	71%	77%	72%	75%	76%	0.15%
UNT	84%	83%	81%	79%	77%	78%	80%	77%	100%	100%	74%	74%	76%	-0.80%
UTA	96%	98%	86%	85%	89%	79%	73%	78%	77%	75%	76%	75%	72%	-1.91%
UTD	78%	79%	88%	90%	63%	63%	51%	49%	48%	49%	51%	49%	52%	-2.53%
UTEP	78%	77%	95%	94%	94%	98%	98%	99%	98%	95%	99%	98%	97%	1.81%
UTSA	99%	99%	99%	99%	99%	99%	99%	99%	90%	89%	83%	85%	79%	-1.59%
Doctoral Universities														
SHSU	87%	82%	81%	84%	77%	70%	76%	71%	68%	66%	68%	69%	65%	-1.89%
TAMUCC	88%	85%	88%	89%	86%	82%	83%	84%	84%	82%	79%	84%	87%	-0.08%
TAMUCM	91%	89%	88%	87%	86%	87%	60%	78%	52%	56%	57%	70%	61%	-2.52%
TAMUK	100%	100%	100%	99%	99%	100%	100%	97%	99%	91%	97%	97%	98%	-0.16%
TWU	97%	83%	62%	53%	50%	48%	53%	65%	81%	76%	74%	70%	85%	-0.94%
TX Southern	100%	100%	100%	100%	100%	99%	99%	99%	99%	99%	99%	100%	72%	-2.18%
TX State	73%	81%	77%	76%	76%	72%	73%	76%	73%	52%	56%	53%	61%	-1.25%
Comprehensive Universities														
Lamar	95%	94%	94%	94%	94%	94%	97%	93%	94%	94%	93%	86%	73%	-1.76%
PVAM	100%	97%	94%	95%	97%	97%	97%	86%	85%	80%	87%	86%	86%	-1.05%
SFA	86%	86%	86%	84%	86%	84%	84%	84%	82%	81%	84%	83%	75%	-1.00%
TAMIU	81%	94%	94%	81%	90%	90%	87%	84%	88%	86%	100%	99%	99%	1.71%
Tarleton	95%	92%	93%	87%	86%	86%	80%	79%	81%	77%	79%	82%	84%	-0.87%
UTPA	100%	100%	100%	100%	100%	100%	100%	100%	68%	62%	86%	68%	70%	-2.34%
WTAMU	88%	91%	47%	90%	98%	97%	95%	94%	96%	91%	91%	75%	79%	-0.82%
Master's Universities														
Angelo	97%	92%	64%	48%	44%	57%	78%	58%	84%	86%	89%	80%	90%	-0.56%
Midwestern	99%	98%	99%	99%	93%	93%	100%	95%	83%	83%	80%	82%	81%	-1.35%
UTB			100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	0.00%
UTT	100%	100%	94%	89%	93%	91%	91%	89%	80%	82%	84%	85%	85%	-1.18%

because the lowest part of the range is due to the acceptance rates of TX State. TX State's yearly acceptance rates have been dropping steadily over the course of the study and do not appear to be erroneous.

UNT appears to have a couple of erroneous acceptance rates. During 2006 and 2007, UNT's acceptance rates were both 100%. This is out of line with their other acceptance rates, which range from 74% to 84%. These likely erroneous rates have little impact on the acceptance rate range for emerging research institutions as without them, the rate range would be 48% to 99%. WTAMU appears to have an anomalous rate in the year 2000. All rates for WTAMU range from 79% to 98% except for the year 2000 where the rate is reported to be 47%. This also affected the acceptance rate range for the comprehensive institutions. Without this likely erroneous rate, the acceptance rate range would be from 62% to 100%. Attempts were made to confirm whether the suspect rates are accurate, by inquiring directly with the institutions. These efforts were unsuccessful for various reasons which include the institutions reporting the same data as found at the THECB or institutions no longer maintaining the data. Because of these likely errors in the data, the median acceptance rates are more helpful in showing a progression of reduced selectivity as the institutional classification is further removed from the research classification.

TTU and UTEP are two of the three institutions with average annual percent increases in acceptance rates and both seem unlikely candidates for becoming less selective as the institutions are part of the emerging research institutional classification. TTU's acceptance rates appear to be correct and without extremes, but quite variable from year to year. The lowest is 67% in 2003 and 2004 and the highest rate is 77% in 2007. UTEP's acceptance rates are less variable than TTU's, but have a distinct jump between 1999 and 2000 where the acceptance rate went from 77% to 95%. The acceptance rates have remained in the mid- to upper-90s ever since. The decrease in selectivity among two institutions within the emerging research classification is counter to the predictions of mimetic isomorphism, which would predict increased selectivity in an attempt to mimic the practices of the successful/research institutions. One possible explanation for this could be that these institutions are committed to increasing access for students in the region in which they are located as both institutions are somewhat isolated from comparable institutions. Without confirmation as to the reasons why selectivity decreased, mimetic isomorphism should be questioned as the emerging research classification would be the most likely group to increase or at least maintain selectivity.

Simple OLS analysis was used to examine the changes in acceptance rates over time to determine if changes were correlated with time and if those correlations were statistically significant. The results of the analysis for each institution were compared to the other institutions within the study to determine if the institutions' changes in acceptance rates are like those of the other instructions. Regression analysis could only be conducted for 25 out of the 26 institutions because UTB had no changes in their acceptance rates, which remained constant at 100%. The OLS model was a poor fit for five (20%) of the institutions as indicated by the negative adjusted R^2 score. The acceptance rates for these institutions were not correlated with time. Interestingly, four of these institutions, UNT, TWU, WTAMU and Angelo, are those that were discussed previously as having likely erroneous acceptance rates.

The majority of the other 20 institutions, 18 (80%), were found to have acceptance rates that were decreasing over time and 15 of those (60%) were decreasing significantly (two at $p < .05$, two at $p < .01$ and 11 at $p < .001$). Two institutions (8%) were found to have acceptance rates increasing over time, one of which was doing so significantly ($p < .01$). The institutions with significant decreases in acceptance rates have small rates of change, the largest being .034%, but these rates are noticeably larger than those belonging to institutions that only have decreases, but not significant decreases in their acceptance rates.

When the anomalous acceptance rate for 2000 for WTAMU was removed from the analysis, the model was found to be a better fit (i.e. positive adjusted R^2); however the changes in applicant acceptance rates were found to be decreasing over time, but not significantly. When the anomalous acceptance rates for 2006 and 2007 for UNT were removed from the analysis, the model was found to be a better fit (i.e. positive adjusted R^2) and the coefficient was found to significantly decreasing ($p < .001$) over time. Using the adjusted analyses for WTAMU and UNT would then increase the proportion of institutions that have become more selective to 88%. Table 5.30 contains the details of the OLS analysis of acceptance rates for each institution.

The descriptive and inferential data both strongly suggest that institutions are becoming more selective in their acceptance of first-time freshmen and this aligns with the predictions of mimetic isomorphism. Eighty-five percent (85%) of the institutions had average annual percent decreases in their acceptance rates, which indicates the institutions are accepting a smaller proportion of applicants. Regression analysis revealed that 80% of institutions had acceptance rates that were decreasing over time and that 60% of institutions had acceptance rates that were decreasing significantly over time. While significance may be overstated due to the nature of autocorrelated data, the coefficients are unbiased. These rates are small however, so further increases in selectivity are likely to progress very slowly. While the data does seem to confirm mimetic isomorphic forces, there are a couple of curious cases among the research institutions that call this into question. Descriptive data indicated that TTU and UTEP had average annual percent increase in acceptance rates indicating that their selectivity had not increased, but rather decreased. The inferential analysis confirmed this is the case for UTEP, but revealed that acceptance rates for TTU were not correlated with time. The emerging research institutions should be those most likely to become more selective under the tenets of mimetic isomorphism, so these results are counter to those predictions.

Table 5.30 Simple OLS Analysis Results Acceptance Rates for Each Institution

Institution	Constant	Coefficient (t statistic)	Adjusted R^2	F	Significance of Model
Research Universities					
TAMU	9.415	-.004 (-1.065)	0.011	1.133	0.31
UT	54.369	-.027*** (-4.367)	0.601	19.07	0.001
Emerging Research Universities					
TTU	-1.916	.001 (.539)	-0.063	0.29	0.601
UNT[1]	2.249	-.001 (-.107)	-0.09	0.011	0.917
UTA	39.794	-.019*** (-6.174)	0.756	38.122	.000
UTD	69.001	-.034*** (-5.001)	0.667	25.012	.000
UTEP	-26.259	.014** (3.320)	0.455	11.024	0.007
UTSA	34.19	-.017*** (5.769)	0.729	33.277	.000
Doctoral Universities					
SHSU	35.977	-.018*** (-7.904)	0.837	62.481	.000

Table 5.30 – Continued

TAMUCC	8.555	-.004 (-2.030)	0.206	4.122	0.067
TAMUCM	63.393	-.031*** (-4.645)	0.632	21.572	0.001
TAMUK	8.25	-0.004* (-2.286)	0.26	5.226	0.043
TWU[2]	-5.806	.003 (.273)	-0.084	0.075	0.77
TX Southern	20.463	-.010 (-1.892)	0.177	3.58	0.085
TX State	41.432	-.020*** (-4.349)	0.599	18.913	0.001
		Comprehensive Universities			
Lamar	20.409	-0.01* (-2.561)	0.317	6.557	0.026
PVAM	28.11	-.014*** (-4.777)	0.645	22.824	0.001
SFA	12.506	-.006** (-3.864)	0.537	14.927	0.003
TAMIU	-16.935	.009 (2.054)	0.211	4.217	0.065
Tarleton	24.961	-.012*** (-4.530)	0.619	20.522	0.001
UTPA	64.091	-.032** (-4.183)	0.579	17.499	0.002
WTAMU[3]	-3.313	.002 (3196)	-0.087	0.038	0.848
		Master's Universities			
Angelo[2]	-20.507	.011 (.786)	-0.033	0.618	0.448
Midwestern	37.248	-.018*** (-6.092)	0.751	37.114	.000
UTB[4]	NA				
UTT	28.863	-.014*** (-5.683)	0.723	32.293	.000

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

[1] OLS results when anomalous observations are dropped are as follows: Constant = 15.292; Coefficient = -.007***; T statistic = -5.810; Adjusted R^2 = .766; F = 33.754; and Significance of Model = .000.

[2] Institution with six-year section of acceptance rates from 2000 to 2005 that are likely erroneous.

[3] OLS results when anomalous variable is dropped are as follows: Constant = 17.416; Coefficient = -.008; T statistic = -1.614; Adjusted R^2 = .127; F = 2.605; and Significance of Model = .138.

[4] Regression could not be conducted as the all the observations were consistently 100%.

Even with the great similarities in acceptance rates among the institutions, there are some notable differences. While most of the institutions are generally becoming more selective, they are still not alike in terms of the degree of selectivity. Even though there are some questions about the veracity of the acceptance rates for some institutions that may be skewing the acceptance rates ranges for the institutional classifications, the median acceptance rates for the classifications are helpful in showing that the typical acceptance rates for each classification are distinct. While some institutions, such as

UTD, have acceptance rates that better align with institutions in other classifications, there is still a general distinction in degrees of selectivity among the institutions. Another notable difference is that there are a few, albeit a small few, institutions that had an average annual percent increase in acceptance rate indicating that the institutions was actually decreasing its selectivity. In addition about a quarter of the institutions either had acceptance rates that were not correlated with time or were found to have acceptance rates decreasing over time. A final notable difference is that UTB maintained open access throughout the study time period, while the other institutions either moved to an admissions model that involved a selection process or evolved their selection process. It is for these reasons that the null hypothesis must be rejected as all institutions are not becoming more selective over time.

5.1.2.5 Applicant Rate of Top 10% Students

Examination of the 26 institutions' appeal to the most prepared high school students revealed that there is not a trend of increasing proportions of applicants from the top 10% of their high school class applying to the institutions in this study. Only 46% of the institutions had an average annual percent increase in the rate of applications from top 10% students. The research institutions have the highest rate of top 10% applicants ranging from 20% to 39% of total applications and a median rate of 35%. TAMU's had an average annual percent decrease in top 10% applicants, while UT had an increase. The emerging research universities' rate of applicants ranged from 8% to 26% with a median rate of 14%. The majority of emerging research institutions, four out of the six, had average annual percent decreases in their top 10% applicant rate.

The doctoral universities' rate of applicants ranged from 1% to 23% with a median rate of 11%. TX Southern had a very low rate of 10% applicants that only ranged from 1% to 4%. The other institutions typically had rates no lower than 9%. TWU also stands out within this group as the institution had the largest increase in in top 10% applicants at an average annual percent change of 15%. Like the emerging research universities, a majority of the institutions within the doctoral classification, four out of the seven, had an average annual percent decrease in their applicant rates. The comprehensive universities' rate of applicants ranged from 2% to 31% with a median rate of 13%. WTAMU is responsible for increasing the range of top 10% applicants as their levels are more in line with institutions with the research universities classification. The majority of the institutions within this classification, four out of the seven, had an average annual percent increase in their top 10% applicant rate. The master's universities' rate of applicants ranged from 5% to 16% with a median rate of 9%. The institutions within this classification were evenly split between those that had an average annual percent increase in applicant rate and those that had a decrease. Table 5.31 contains the top10% applicant rate for all the institutions for each fall term from 1998 to 2010 along with the institutions' average annual percent change in those rates.

Mimetic isomorphic forces do not appear to be affecting the applicant rate of to 10% students as the descriptive findings are in contrast to the theory's predictions. The two institutional classifications besides the research classification – the emerging research and doctoral universities – that would be most likely to attract the most prepared high school students are, in large majority, attracting proportionately fewer of them. The

Table 5.31 Applicant Rate of Top 10% Students for Each Institution

Institution	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Avg. Annual Percent Change
Research Universities														
TAMU	35%	34%	32%	34%	33%	33%	33%	33%	34%	34%	34%	35%	35%	-0.08%
UT	20%	21%	21%	38%	35%	36%	38%	39%	38%	38%	37%	37%	38%	6.94%
Emerging Research Universities														
TTU	20%	19%	15%	16%	15%	14%	16%	17%	17%	16%	17%	17%	17%	-1.03%
UNT	10%	9%	12%	12%	14%	14%	15%	14%	14%	14%	14%	14%	16%	4.19%
UTA	18%	20%	17%	15%	15%	14%	16%	15%	15%	17%	8%	17%	16%	-0.60%
UTD	19%	26%	19%	24%	10%	11%	9%	8%	15%	14%	16%	14%	17%	-0.92%
UTEP		8%	11%	12%	13%	13%	14%	13%	12%	14%	14%	13%	17%	8.36%
UTSA	16%	8%	17%	15%	14%	12%	10%	3%	10%	10%	11%	10%	11%	-2.68%
Doctoral Universities														
TAMUCC	18%	15%	18%	16%	14%	13%	18%	16%	17%	0%	9%	15%	14%	-1.86%
TAMUCM	14%	10%	11%	9%	13%	16%	8%	10%	7%	9%	10%	11%	9%	-2.65%
TAMUK	16%	15%	18%	15%	14%	14%	16%	16%	17%	23%	21%	16%	15%	-0.54%
TWU		5%	10%	7%	6%	7%	8%	11%	14%	15%	15%	13%	14%	14.92%
TX Southern		3%	3%	2%	2%	2%	1%	2%	2%	2%	2%	4%	3%	0.76%
TX State	13%	14%	12%	12%	12%	13%	13%	14%	13%	9%	10%	9%	11%	-1.35%
Comprehensive Universities														
Lamar	14%	13%	12%	10%	13%	14%	13%	13%	13%	13%	13%	12%	12%	-0.71%
PVAM	7%	6%	15%	8%	14%	14%	12%	14%	13%	13%	8%	7%	6%	-1.41%
SFA	10%	10%	11%	10%	10%	11%	12%	11%	11%	11%	11%	11%	13%	2.12%
TAMIU	17%	19%	17%	13%	17%	17%	14%	14%	17%	18%	21%	21%	24%	3.26%
Tarleton	8%	13%	10%	10%	2%	3%	6%	9%	8%	8%	8%	8%	5%	-2.09%
UTPA				4%	4%	3%	6%	7%	14%	13%	19%	13%	16%	26.06%
WTAMU		19%	10%	29%	30%	30%	29%	31%	29%	28%	28%	22%	24%	2.21%
Master's Universities														
Angelo		13%	14%	7%	5%	6%	10%	7%	10%	11%	11%	10%	11%	-1.49%
Midwestern	9%	9%	6%	8%	7%	8%	8%	9%	9%	9%	10%	12%	12%	2.66%
UTB											7%	5%	6%	-4.71%
UTT			10%	11%	6%	7%	7%	7%	14%	16%	16%	15%	15%	4.14%

Note: Blank space indicates that data was not reported to the THECB for that year.

comprehensive universities appear to have more appeal to these students. Further still, the bottom rate of the master's universities applicant rate range is higher than the bottom rates of both the doctoral and comprehensive universities. While mimetic isomorphism would predict that master's universities would compete for the most prepared students and thus would result in increasing rates of top 10% applicants, the anomaly lies with the emerging research and doctoral universities.

Simple OLS analysis was used to examine the changes in the rate of top 10% applicants and the results confirm the descriptive findings. The OLS model was a poor fit for 9 (35%) of the institutions as indicated by the negative adjusted R^2 score. The applicant rates for the institutions were not correlated with time. Most of these institutions are clustered in the comprehensive and master's institutions classifications, but one can be found among both the emerging research and doctoral classifications.

Among the remaining 17 (65%) institutions, 12 (46%) were found to have applicant rates that were increasing over time and seven of those institutions (27%) had applicant rates that were increasing significantly over time (one at $p < .05$; three at $p < .01$, and three at $p < .001$). The remaining six institutions (23%) had applicant rates that were decreasing over time and one of those institutions (4%) had applicant rates that were decreasing significantly over time. The institutions that had significant changes in their applicant rates are found evenly dispersed among all of the institutional classifications.

The rates of change among the institutions with significant increases (or decreases) in applicant rate are extremely small. The largest rate of change is .017% and most of the rates are less than .01%. The rates of change for those institutions that do have significant applicant rates are similar in rate to those that are significant. The small rates of change call attention to the small amount of variability between the applicant rate observations for most of the institutions. There simply is not that much movement in applicant rates at most institutions. Table 5.32 contains the details of the simple OLS analysis of applicant rates of top 10% students for each institution.

Table 5.32 Simple OLS Analysis Results for Applicant Rate of Top 10% Students for Each Institution

Institution	Constant	Coefficient (t statistic)	Adjusted R^2	F	Significance of Model
Research Universities					
TAMU	-1.314	.001 (1.224)	0.04	1.499	0.246
UT	-28.403	.014** (3.801)	0.528	14.449	0.003
Emerging Research Universities					
TTU	1.598	-.001 (-.582)	-0.058	0.339	0.572
UNT	-8.126	.004*** (4.698)	0.637	22.075	0.001
UTA	6.322	-.003 (-1.581)	0.111	2.499	0.142
UTD	119.37	-.006 (-1.518)	0.098	2.304	0.157
UTEP[1]	-15.627	.008** (3.720)	0.517	13.835	0.003
UTSA	8.481	-.004 (-1.632)	0.122	2.664	0.131
Doctoral Universities					
SHSU[1]	-4.862	.004 (1.256)	0.05	1.579	0.238
TAMUCC	11.042	-.005 (-1.587)	0.112	2.52	0.141
TAMUCM	5.281	-.003 (-1.455)	0.085	2.116	0.174
TAMUK	-4.569	.002 (1.221)	0.039	1.492	0.247
TWU[1]	-20.605	.010*** (6.023)	0.746	36.281	0.000
TX Southern[1]	-0.678	.0003 (.519)	-0.071	0.269	0.615
TX State	5.735	-0.003* (-2.76)	0.356	7.619	0.019
Comprehensive Universities					
Lamar	0.677	-.0000275 (-.346)	-0.079	0.12	0.736
PVAM	1.867	-.001 (-.324)	-0.081	0.105	0.752
SFA	-2.974	.002** (3.204)	0.436	10.267	0.008
TAMIU	-8.633	.004 (2.200)	0.242	4.84	0.050
Tarleton	4.37	-.002 (-.974)	-0.004	0.949	0.351
UTPA[2]	-33.812	.017*** (5.561)	0.769	30.926	0.001
WTAMU[1]	-9.905	.005 (.984)	-0.003	0.969	0.348
Master's Universities					
Angelo[1]	-0.535	.0003 (.129)	-0.098	0.017	0.900

Table 5.32 – Continued

Midwestern	-6.187	3.392** (.003)	0.467	11.503	0.006
UTB[3]	10.015	-.005 (-.577)	-0.5	0.333	0.667
UTT[4]	-17.385	.009* (3.062)	0.456	9.379	0.014

Note 1: * significant at < .05; ** significant at < .01; *** significant at < .001
Note 2: Attempts were made to obtain missing data directly from the institutions, but none was available.

[1] Missing one year of data.

[2] Missing three years of data.

[3] Missing all but the last three years of data.

[4] Missing two years of data.

In summary, the descriptive and inferential findings indicate that a majority of institutions are attracting fewer applicants from the top 10% of their high school graduating class and this is counter to the predictions of mimetic isomorphic change. Less than half of the institutions (46%) had an average annual percent increase in their applicant rates. The OLS analysis revealed that only 46% of the institutions had applicant rates that were increasing over time and only seven of those institutions were found to have significant increases in applicant rates. The majority of the institutions most likely and most capable of attracting the most prepared students, the emerging research and doctoral universities, are also the institutions with the highest number of institutions that had average annual percent decreases in their applicant rates and the highest number of institutions with applicant rates that had decreased over time.

The descriptive analysis also revealed inconsistencies in applicant rate ranges for the institutional classifications, which that further indicate that there is not a trend toward the institutions having an increased appeal to the most prepared students. The applicant rate ranges and median rates for the institutions outside of the research universities classification are quite distinct from those of the research universities. The inferential findings indicate that the rates of change are extremely small, so it is unlikely that the non-research universities will be catching up to the research universities in terms of top 10% applicant rates. In sum, the descriptive and inferential findings clearly in indicate that the institutions are not becoming more alike; therefore, the null Hypothesis 1s rejected for top 10% applicant rates.

5.1.2.6 Summary of Findings for Hypothesis 1

A trend toward homogenization of the institutions was detected for most of the aspects of the analysis of Hypothesis 1, which includes program duplications for all degree levels combined, bachelor programs and doctoral programs; master's and doctoral level program proportions; research expenditures, and first-time freshmen acceptance rates. The descriptive and inferential data indicated that at least half of the institutions had increases in the respective areas (a decrease for acceptance rates means an increase in selectivity). The exceptions to this include master's level program duplications and applicant rates of top 10% students. Table 5.33 contains summary metrics for each of the various aspects of the analysis for Hypothesis 1.

Table 5.33 Summary of Descriptive and Inferential Findings for Hypothesis 1

Program Duplications					
	Average Annual Percent Change		Simple OLS Analysis		
	Increase in Duplicated Programs	Increase in Duplication Rate	Rates Increased Over Time	Rates Increased Significantly Over Time	Total Rates Increased Over Time
Percent of Institutions					
All Levels	62%	69%	50%	12%	62%
Bachelor	50%	69%	54%	8%	62%
Master's	50%	54%	35%	8%	42%[1]
Doctoral	64%	50%	39%	17%	56%

Table 5.33 – Continued

Graduate Level Program Proportions					
	Increase in Programs	Increase in Program Proportion	Increased Over Time	Increased Significantly Over Time	Total Increased Over Time
Master's	65%	88%	46%	23%	69%
Doctoral	64%	55%	25%	30%	55%

Research Expenditures			
Increase in Expenditures	Increased Over Time	Increased Significantly Over Time	Total Increased Over Time
92%	12%	65%	77%

First-time Freshmen Acceptance Rates			
Decrease in Rates	Decreased Over Time	Decreased Significantly Over Time	Total Decreased Over Time
85%	20%	60%	80%

Top 10% Applicant Rates			
Increase in Applicant Rate	Increased Over Time	Increased Significantly Over Time	Total Increased Over Time
46%	19%	26%	46%

[1] Total does not equal the other two factors due to rounding.

The trends towards homogenization of doctoral program duplications, doctoral program proportions, research expenditures and, for the most part, acceptance rates support the tenets of mimetic isomorphic change. The trends towards homogenization of bachelor level program duplications, master’s program proportions and, to certain extent, acceptance rates are ostensible in support of mimetic isomorphic change. Close examination of patterns within the descriptive data revealed unexpected inconsistencies that run counter to the predictions of mimetic isomorphic change. Support for attributing homogenization to mimetic isomorphic change is mixed at best.

The strength of the trends towards homogenization may also be questioned due to a couple of factors common to all aspects of the analysis; small rates of change and overstated significance due to autocorrelated data. The rates of change are so small (usually less than .04%), even minuscule in some cases (less than .01%) that changes in any of the variables is very slow at best and may be virtually undetectable in a practical setting. In addition, rates of change among institutions with significant rates of change are generally no greater than institutions that have only correlated, but not significantly correlated rates of change. Significant rates of increase (or decrease in the case of acceptance rates) for all but research expenditures and acceptance rates are found presently in well below 50% of the institutions. If significance is overstated then even fewer institutions can be confidently considered as support for homogenization.

So, trends towards homogenization may exist in some cases, but Hypothesis 1 aimed to test whether or not the institutions are becoming more like one another based on the selected variables. Questions regarding trend strength and pace as well as cases that can be confidently used to support homogenization highlight the common finding for each aspect of the analysis, which is simply that all institutions are not moving in the same direction. For instance, most institutions may be increasing doctoral program duplication rates, but there are other institutions that are decreasing their doctoral program duplication rates. Further, the institutions within the institutional classifications outside of the research universities classification are not like the research universities and with the small rates of change, they will not become like the research universities in the foreseeable future without a dramatic change. It is for these common reasons that the null hypothesis was rejected for each aspect of the analysis of Hypothesis 1.

5.1.3 Findings for Hypothesis 2

Hypothesis 2 is as follows: Public universities in Texas, will, through time, resemble the two public research/flagship universities (i.e. The University of Texas and Texas A&M University) in regards to:

a. Duplicated programs;
b. Proportion of advanced degrees (master's and doctoral) offered;
c. Acceptance rate of first-time freshman applicants;
d. Rate of freshman applicants from top 10% of high school graduating class; and
e. Research expenditures per FT/FTE-T/TT faculty member.

Mimetic isomorphism change predicts that institutions will become more homogenous over time as institutions mimic the most successful institutions. The Hypothesis 1s intended to test whether the non-research institutions are in fact becoming like the research institutions. The institutional data pertaining to each variable was aggregated into two groups; the research group and the non-research group. The research group, as already noted in the hypothesis statement, is TAMU and UT. The non-research group is an aggregate of the remaining 24 institutions in the study. The findings from the analysis of Hypothesis 2 are organized according the subsections of the statement, i.e. program duplications; proportion of advanced degrees; acceptance rate of freshman applicants; top 10% applicant rate; and research expenditures. A summary of findings follows the presentation of the results for program duplications and graduate level programs. The sub-section concludes with a summary of all key findings for Hypothesis 2.

5.1.3.1 Program Duplications

5.1.3.1.1 All degree levels combined

When considering all programs together, regardless of degree level, the non-research group has noticeably higher rates of duplication than the research group. In comparing the rates for both groups, the non-research group had 33% to 47% higher program duplication rates than the research group over the five, five-year intervals. The average annual percent change in duplication rates increased by .73% for the non-research group and .2% for the research group. While this indicates that both groups had increases in program duplication rates, the non-research group had greater increases. A two-tailed z-test was conducted for each of the five, five year intervals to determine if there was a statistically significant difference between the program duplication rates for the non-research and the research groups.

The results of the z-test confirmed that the non-research group is different from the research group and has been throughout the study time period. The z-test revealed that there was a statistically significant difference in the duplication rates of the two groups for each of the five analyses (all at $p < .001$). From this, it is concluded that the non-research universities are not becoming more like the research universities in terms of program duplication rates for all degree levels combined. Table 5.34 contains the number of programs, number of duplications, and duplication rates for each group as well as the z statistic.

Table 5.34 Two-tailed Z-test Results for Comparison of Duplication Rates for Non-Research and Research Institutions for All Degree Levels Combined

Year	Group	Number of Programs	Number of Duplications	Duplication Rate	z statistic
1990	Non-Research	3837	2388	.622	7.98***
	Research	762	356	.467	
1995	Non-Research	3483	2273	.653	10.49***
	Research	785	354	.451	
2000	Non-Research	3510	2376	.676	9.70***
	Research	802	397	.495	
2005	Non-Research	3353	2288	.682	11.06***
	Research	836	399	.477	
2010	Non-Research	3334	2380	.713	12.49***
	Research	842	410	.486	

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

5.1.3.1.2 Bachelor level programs

When considering bachelor programs, the non-research group again has noticeably higher rates of duplication than does the research group. In comparing the rates for both groups, the non-research group had 23% to 43% higher program duplication rates than the research group over the five, five-year intervals. For the non-research group, duplication rates increased by an average of .68% per year, while the duplication rates for the research decreased by an average of .14% per year. This suggests that the two groups were becoming more dissimilar. A two-tailed z-test was conducted for each of the five, five year intervals to determine if there was a statistically significant difference between the program duplication rates for the non-research and the research groups.

The results of the z-test confirmed that the non-research group is different from the research and has been throughout the study time period. The z-test revealed that there was a statistically significant difference in the duplication rates of the two groups for each of the five analyses (all at $p < .001$). From this, it is concluded that the non-research universities are not becoming more like the research universities in terms of program duplication rates for bachelor level programs. Table 5.35 contains the number of programs, number of duplications, and duplication rates for each group as well as the z statistic for bachelor level programs.

Table 5.35 Two-tailed Z-test Results for Comparison of Duplication Rates for Non-Research and Research Institutions for Bachelor Level Programs

Year	Group	Number of Programs	Number of Duplications	Duplication Rate	z statistic
1990	Non-Research	2094	1402	.670	4.00***
	Research	264	144	.546	
1995	Non-Research	1819	1304	.716	6.49***
	Research	267	139	.520	
2000	Non-Research	1807	1308	.723	5.72***
	Research	279	155	.555	
2005	Non-Research	1674	1223	.730	6.81***
	Research	291	155	.532	
2010	Non-Research	1681	1278	.760	8.17***
	Research	296	157	.530	

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

5.1.3.1.3 Master's level programs

When considering master's programs, the non-research group again has noticeably higher rates of duplication than does the research group. In comparing the rates for both groups, the non-research group had 31% to 51% higher program duplication rates than the research group over the five, five-year intervals, which is higher than that seen at the bachelor level. For the non-research group, duplication rates increased by an average of .71% per year, while duplication rates for the research group decreased by an average of .03% per year. Like at the bachelor level, this too suggests that the two groups were becoming more dissimilar, or because the average annual change is so small for the research group, it may be more accurate that the non-research group was becoming dissimilar from the research group. A two-tailed z-test was conducted for each of the five, five year intervals to determine if there was a statistically significant difference between the program duplication rates for the non-research and the research groups.

The results of the z-test confirmed that the non-research group is different from the research and has been throughout the study time period. The z-test revealed that there was a statistically significant difference in the duplication rates of the two groups for each of the five analyses (all at $p < .001$). From this, it is concluded that the non-research universities are not becoming more like the research universities in terms of program duplication rates for master's level programs. Table 5.36 contains the number of programs, number of duplications, and duplication rate for each group as well as the z statistic for master's level programs.

Table 5.36 Two-tailed Z-test Results for Comparison of Duplication Rates for Non-Research and Research Institutions for Master's Level Programs

Year	Group	Number of Programs	Number of Duplications	Duplication Rates	z statistic
1990	Non-Research	1408	843	.598	4.37***
	Research	276	126	.456	
1995	Non-Research	1389	854	.614	5.24***
	Research	290	130	.448	
2000	Non-Research	1433	932	.650	6.43***
	Research	299	135	.451	
2005	Non-Research	1375	896	.651	7.08***
	Research	322	141	.437	
2010	Non-Research	1357	928	.683	7.73***
	Research	320	145	.453	

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

5.1.3.1.4 Doctoral level programs

When considering doctoral degree program, the difference in duplication rates between the non-research and research group is notably less than the differences observed at the bachelor and master's levels. In comparing the rates for both groups, the non-research group had 5% to 23% higher program duplication rates than the research group over the five, five-year intervals. The average annual percent changes were also notably different than those observed among the bachelor and master's levels. The non-research group had an increase of 1.89% per year and research group had an increase of 1.16% per year. Both groups had increases in duplication rate, but the non-research group's rates were increasing by a greater degree. A two-tailed z-test was conducted for each of the five, five year intervals to determine if there was a statistically significant difference between the program duplication rates for the non-research and the research groups.

The results of the z-tests are different from those seen at the bachelor and master's level. The z-test revealed that there was not a statistically significant difference in the duplication rates of the two groups for the 1990, 1995, and 2000 analyses. Statistical difference was found in the 2005 and 2010 analyses (both at $p < .05$). From this, it is concluded that there was no difference between the non-research and research groups until after 2000 and then the two groups diverged in terms of doctoral level program duplications. Table 5.37 contains the number of programs, number of duplications, and duplication rate for each group as well as the z statistic for doctoral level programs.

Table 5.37 Two-tailed Z-test Results for Comparison of Duplication Rates for Non-Research and Research Institutions for Doctoral Level Programs

Year	Group	Number of Programs	Number of Duplications	Duplication Rates	z statistic
1990	Non-Research	335	143	.426	.93
	Research	222	86	.387	
1995	Non-Research	275	115	.418	1.04
	Research	228	85	.372	
2000	Non-Research	270	136	.503	.58
	Research	224	107	.477	
2005	Non-Research	304	169	.555	2.13*
	Research	223	103	.461	
2010	Non-Research	296	174	.587	2.50*
	Research	226	108	.477	

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

5.1.3.1.5 Summary of findings for program duplications

The findings from the descriptive analyses and the z-tests indicate that the non-research group's program duplications were not becoming more like the research group when all degree level are combined or when degree levels were considered individually. This was especially pronounced at the doctoral level when the differences between the groups were not statistically significant until the last two analyses of the 2005 and 2010 intervals. At the doctoral level, the two groups became dissimilar during the course of the study. These findings ostensibly are counter to the predictions of mimetic isomorphic change as it would be expected that the non-research group would become like the research group, but herein lies the unanticipated limitation of using program duplications rates to test tenets of mimetic isomorphic change. The non-research group clearly has proportionately greater amounts of program duplications (at all degree levels, collectively or individually), which indicates that the institutions as a group have more programmatic homogeneity and this would be predicted by mimetic isomorphic change. However, programmatically mimicking the research universities will most likely lead to what has been observed in this research, a divergence between the non-research and research groups. Based on the findings for the program duplications, mimetic isomorphic change cannot be ruled out as the cause of the differences between the two groups, but it also cannot be credited for the groups becoming more alike.

5.1.3.2 Graduate Level Program Proportions

5.1.3.2.1 Master's level

When considering master's degree programs, the non-research group has master's program proportions that are fairly close to the proportions of the research group. When comparing the proportions of both groups, the non-research group has proportions that are 1% to 9% higher over time than the master's proportions of the research group. For the non-research group, master's proportions increased by an average of .54% per year and by an average of .25% per year for the research group. A two-tailed z-test was conducted for each of the five, five year intervals to determine if there was a statistically significant difference between the master's proportions for the non-research and the research groups.

The z-test confirmed the descriptive findings that the non-research and research group are similar with regard to master's level proportions. The z-test revealed that there was no statistically significant difference in master's proportions for the two groups for each of the five analyses. The non-research group is not becoming more like the research group as the groups are, statistically speaking, already alike. Table 5.38 contains the number of total programs, number of master's programs, and proportion of master's programs for each group as well as the z statistic.

Table 5.38 Two-tailed Z-test Results of Comparison of Master's Level Program Proportions for Non-research and Research Institutions

Year	Group	Total Number of Programs	Master's Programs Number	Proportion Master's Programs	z statistic
1990	Non-Research	3837	1408	.367	.25
	Research	762	276	.362	
1995	Non-Research	3483	1389	.399	1.52
	Research	785	290	.369	
2000	Non-Research	3510	1433	.408	1.85
	Research	802	299	.373	
2005	Non-Research	3353	1375	.410	1.31
	Research	836	322	.385	
2010	Non-Research	3334	1357	.407	1.43
	Research	842	320	.380	

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

5.1.3.2.2 Doctoral level

When considering doctoral degree programs as a proportion of all programs, there is a great distinction between the proportions for the non-research and research groups. The non-research group had doctoral program proportions that were between 66% and 73% less than the research group across the five, five-year intervals in the study. The large difference between the non-research group and the research group persisted throughout the study time period as evidenced by the group's small average annual increase in proportions of .11%. Compounding the disparity between the groups was the research group's average decrease in program proportions of .4% per year. The descriptive data strongly suggests that the non-research group and the research group were not alike in their proportions of doctoral programs. A two-tailed z-test was conducted for each of the five, five year intervals to determine if there was a statistically significant difference between the doctoral proportions for the non-research and the research groups.

The z-tests results confirmed the implications of the descriptive findings. The two groups are not alike nor did they become more alike over the course of the study as there was a statistically significant difference in the doctoral proportions of the two groups for each of the five analyses (all at $p < .001$). Table 5.39 contains the total number of programs, number of doctoral programs, and proportion of doctoral programs as well as the z statistic for doctoral level programs.

Table 5.39 Two-tailed Z-test Results of Comparison of Doctoral Level Program Proportions for Non-research and Research Institutions

Year	Group	Total Number of. Programs	Doctoral Program Number	Proportion of Doctoral Programs	z statistic
1990	Non-Research	3837	335	.087	-15.77***
	Research	762	222	.291	
1995	Non-Research	3483	275	.079	-16.60***
	Research	785	228	.290	
2000	Non-Research	3510	270	.077	-16.24***
	Research	802	224	.279	
2005	Non-Research	3353	304	.090	-13.73***
	Research	836	223	.267	
2010	Non-Research	3334	296	.089	-14.08***
	Research	842	226	.268	

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

5.1.3.2.3 Summary of findings graduate level program proportions

The findings for the master’s and doctoral proportions are completely opposite from one another. In terms of master’s programs, there is no difference between the proportions of the non-research and research groups. Importantly, this should not be interpreted as the two groups becoming alike as the two groups have been alike over the course of the study. For the doctoral programs, however, there is no evidence of likeness between the proportions of the two groups. So, the non-research group did not become like the research group at either degree level as just clarified, the dissimilarity is from different circumstances.

These findings do not suggest the mimetic isomorphic forces were at work as there was no change in the comparisons of the two groups at both the master's and doctoral levels. However, it is possible that mimetic isomorphic forces brought about the homogeneity of master's level proportions prior to the study time period. Further, it is possible that mimetic isomorphic forces were at work without resulting in observable homogeneity. The findings from Hypothesis 1 revealed that there was a trend towards homogenization of proportions at the doctoral level, but that the institutional rates of change were incredibly small, so homogenization would like occur very slowly. Based on the findings of Hypothesis 1, it is reasonable that homogenization is occurring, but not in a consequential fashion.

5.1.3.3 Research Expenditures per FT/FTE-T/TT Faculty Member

Average research expenditures for the non-research and research groups vary dramatically. The non-research group had anywhere between 83% to 92% lower average annual expenditures than the research group from FY 1990 to FY 2010. The larger differences, in the low 90% range, were found in the earlier years of the study period whereas the later years differences were typically in the mid- to lower 80% range. The greatest mean difference in research expenditures occurred in FY 2010 when the research group outspent the non-research group by $177,931. The smallest mean difference was seen in 1994 when the non-research group was outspent by the research by $116,780.

Both groups had an average annual percent increase in expenditures. The non-research group increased their research expenditures by an average of 10.8% per year, while the research group increased expenditures by an average of 2.92% per year.

A two-tailed z-test was conducted for each of the 21 fiscal years to determine if there was a statistically significant difference between the average research expenditures for the non-research and the research groups. The z-tests confirmed the descriptive findings as there were statistically significant differences in average research expenditures between the two groups for each of the 21 years analyzed (all at $p < .001$). The two groups are not alike nor have they become alike statistically speaking. These findings do not support the predictions of mimetic isomorphic change although, like doctoral proportions, mimetic isomorphic change could be at work. Findings from the analysis of Hypothesis 1 indicated that research group's rates of change were near, but in most cases above the rates of change for the non-research group, which would prevent the non-research group from catching up to expenditure levels seen among the research group. Table 5.40 contains the details of the z-test analyses as well as the number of universities in the groups, average research expenditures per FT/FTE/T/TT faculty member for each group, group variances, and the z score.

Table 5.40 Two-tailed Z-test Results from the Comparison of Research Expenditures for Non-research and Research Groups

Fiscal Year	Group	n[1]	Average Research Expenditures per FT/FTE-T/TT Faculty[2]	Group Variance	z score
1990	Non-Research	24	$9,973	144287692.93	-3.71***
	Research	2	$130,433	2096832235.51	
1991	Non-Research	24	$10,579	131074598.23	-4.34***
	Research	2	$133,471	1589027006.31	

Table 5.40 – *Continued*

1992	Non-Research	24	$12,745	191349662.97	-3.35***
	Research	2	$140,021	2871875706.72	
1993	Non-Research	24	$15,103	250609317.87	-5.43***
	Research	2	$161,827	1438836490.37	
1994	Non-Research	24	$12,533	175593988.32	-5.55***
	Research	2	$129,313	871929524.33	
1995	Non-Research	24	$14,926	226153448.05	-4.61***
	Research	2	$149,717	1692754097.03	
1996	Non-Research	24	$16,095	293475347.34	-4.93***
	Research	2	$150,889	1473287935.51	
1997	Non-Research	24	$16,520	298286241.93	-3.94***
	Research	2	$168,634	2959228906.92	
1998	Non-Research	24	$14,886	219375318.47	-8.44***
	Research	2	$131,699	365069953.52	
1999	Non-Research	24	$13,334	194381826.38	-8.81***
	Research	2	$147,589	448352410.06	
2000	Non-Research	24	$17,400	272520133.76	-17.57***
	Research	2	$153,529	97406957.83	
2001	Non-Research	24	$19,619	293639741.87	-20.88***
	Research	2	$163,545	70567635.28	
2002	Non-Research	24	$22,423	416376143.25	-35.62***
	Research	2	$172,202	658475.75	
2003	Non-Research	24	$22,010	460062662.14	-29.66***
	Research	2	$168,531	10466452.84	
2004	Non-Research	24	$21,591	380317633.47	-13.79***
	Research	2	$165,491	186141156.35	
2005	Non-Research	24	$23,559	505916267.77	-13.98***
	Research	2	$171,719	182514252.58	
2006	Non-Research	24	$24,094	507754104.06	-21.68***
	Research	2	$172,141	50961605.53	
2007	Non-Research	24	$23,774	485742003.83	-30.51***
	Research	2	$170,388	5712055.58	
2008	Non-Research	24	$26,584	741096721.35	-25.00***
	Research	2	$189,145	22803847.51	
2009	Non-Research	24	$30,784	814689342.24	-13.00***
	Research	2	$179,122	192576284.57	
2010	Non-Research	24	$32,591	999075831.99	-6.13***
	Research	2	$210,522	1602195996.45	

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

[1] n = number of universities in group

[2] All dollar amounts in constant 1990 dollars

5.1.3.4 First-time Freshmen Acceptance Rates

First-time freshman acceptance rates for the non-research group and research group differ noticeably. The non-research group consistently had higher rates than the research group each year from 1998 to 2010. This indicates that the non-research group is less selective than the research group in their admissions decisions. The non-research group had acceptance rates that were 9% to 36% higher than the research group over the course of the 13 years that data was available. Although there was a difference between the groups' acceptance rates, both had decreases on average each year. The non-research groups acceptance rate decreased by an average of 1% per year, while the research group's acceptances rate decreased by an average of 1.6% per year. This indicates that the already more selective research group became even more selective than the non-research group and did so in greater increments than the non-research group.

A two-tailed z-test was conducted for each of the 13 years to determine if there was a statistically significant difference between the acceptance rates for the non-research and the research groups. The analysis confirmed the descriptive findings as there were statistically significant differences between the two groups for each of the 13 years (all at $p < .001$). Based on these findings, is it concluded that the non-research group did not become like the research group. These findings are counter to the predictions of mimetic isomorphic change. Like with doctoral proportions and research expenditures, mimetic isomorphic forces could be at work, but the very small increments of change that were revealed through the analysis of Hypothesis 1 make clear that any homogenization would be very slow. Table 5.41 contains the total number of first-time freshmen applicants, the number of accepted applicants and the proportion of applicants accepted as well as the z statistic.

Table 5.41 Two-tailed Z-test Results of Comparison of First-time Freshmen Acceptance Rates for Non-research and Research Institutions

Year	Group	Total Applications	Number Accepted	Acceptance Rate	z statistic
1998	Non-Research	65447	57170	.874	47.14***
	Research	27410	20506	.748	
1999	Non-Research	65527	57054	.870	28.23***
	Research	29679	23740	.800	
2000	Non-Research	79822	67680	.848	27.68***
	Research	34129	26630	.780	
2001	Non-Research	90935	77089	.848	47.69***
	Research	32797	23901	.729	
2002	Non-Research	97641	81639	.836	60.41***
	Research	36456	25029	.687	
2003	Non-Research	105341	86952	.825	87.14***
	Research	38228	23144	.605	
2004	Non-Research	112642	93855	.833	71.80***
	Research	36818	24213	658	
2005	Non-Research	113742	94543	.831	77.57***
	Research	38438	54706	.643	
2006	Non-Research	122145	101030	.827	71.11***
	Research	40937	27034	.660	
2007	Non-Research	127301	102068	.801	58.82***
	Research	42494	28150	.662	
2008	Non-Research	132389	104021	.786	81.29***
	Research	46369	27480	592	
2009	Non-Research	134777	104090	.772	84.11***
	Research	50980	27480	.576	
2010	Non-Research	145597	110642	.760	72.37***
	Research	51748	30683	.593	

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

5.1.3.5 Applicant Rate of Top 10% Students

Applicant rate of students who were in the top 10% of their high school graduating class are quite dissimilar between the non-research and the research groups from 1998 to 2010. The non-research group's rate of top 10% applicants was 50% to

69% lower than the rate of applicants for the research group over the course of the 13 year that data was available. In addition, the non-research group's top 10% applicant rate decreases by an average of .35% per year, while the research group's top 10% applicant rate increased by an average of 2.6% per year, which further widened the differences between the groups.

A two-tailed z-test was conducted for each of the 13 years to determine if there was a statistically significant difference between the top 10% acceptant rates for the non-research and the research groups. The analysis confirmed the descriptive findings as there were statistically significant differences between the two groups for each of the 13 years (all at $p < .001$). Based on these findings, is it concluded that the non-research group did not become like the research group. These findings are, like those of the acceptance rates, counter to the predictions of mimetic isomorphic change. Also like the analysis of acceptance rates, mimetic isomorphic forces could be at work, but the very small increments of change that were revealed through the analysis of Hypothesis 1 make clear that any homogenization would be very slow. Table 5.42 contains the total number of first-time freshmen applicants, the number of top 10% applicants and the proportion of top 10% applicants as well as the z statistic.

Table 5.42 Two-tailed Z-test Results of Comparison of Top 10% Applicant Rates for Non-research and Research Institutions

Year	Group	Total Applications	Top 10% Applications	Top 10% Proportion	z statistic
1998	Non-Research	51774	7115	.137	-46.79***
	Research	27410	7482	.273	
1999	Non-Research	63588	7807	.123	-55.75***
	Research	29679	8009	.270	
2000	Non-Research	72220	9086	.126	-54.23***
	Research	34129	8846	.259	

Table 5.42 – *Continued*

2001	Non-Research	89446	10577	.118	-95.71***
	Research	32797	11701	.357	
2002	Non-Research	95692	10417	.109	-99.39***
	Research	36456	12397	.340	
2003	Non-Research	102868	11519	.112	-103.52***
	Research	38228	13307	.348	
2004	Non-Research	109118	12587	.115	-105.60***
	Research	36818	13182	.358	
2005	Non-Research	110555	12289	.111	-110.66***
	Research	38438	13852	.360	
2006	Non-Research	118181	14838	.126	-105.95***
	Research	40937	14827	.362	
2007	Non-Research	116935	14076	.120	-110.44***
	Research	42494	15440	.363	
2008	Non-Research	132389	16332	.123	-111.62***
	Research	46369	16548	.357	
2009	Non-Research	134777	16769	.124	-116.30***
	Research	50980	18424	.361	
2010	Non-Research	145597	19096	.131	-115.64***
	Research	51748	18858	.364	

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

5.1.3.6 Summary of Findings for Hypothesis 2

The non-research group is not becoming like the research group in any of the aspects of the analysis for Hypothesis 2. The null hypothesis was rejected in almost every case except for some of the doctoral duplications analyses and all of the master's program proportions analyses. In the case of doctoral duplications, there was actually no statistically significant difference in duplications rates for the about the first half of the analysis and then during the latter part of the analysis, the two groups diverged with a statistically significant difference in their duplications rates. In the case of master's program proportions, in each of the five analyses, there was not a statistically significant difference between the proportions of the non-research and research groups, which indicates that the two groups were alike throughout the course of the study.

The overall consistency in the analyses did not provided any evidence for mimetic isomorphic change and in fact, all of the findings are counter to the predictions of mimetic isomorphic change. Program duplication rates proved to be a poor test of mimetic isomorphic change as mimetic isomorphic change would result in increased program duplications for the non-research group that would lead to greater differences in duplications rates between the non-research and research groups. Further and future investigation into relationships of program duplications would be needed in order to discern whether the research universities programs are being duplicated by the non-research universities or if the non-research universities are duplicating the programs of other non-research universities. This would better indicate if mimetic isomorphic forces are prompting program duplication or if the observed homogenization is the result of other forces. The mixed evidence for mimetic isomorphic change that was revealed through the analysis of Hypothesis 1 suggests there may be other or multiple forces at work causing homogenization.

The lack of statistically significant differences between the non-research and research groups for master's program proportions raises some interesting questions in relation to mimetic isomorphic change. Are master's level proportions of the non-research grouping the fully realized results of mimetic isomorphic change? Did the homogenization occur prior to the study time period? Or, alternatively, is the lack of statistically significant differences between the groups the results of demand for master's level programming. Hypothesis 1 indicated that the master's level programs were the least duplicated out of the individual degree levels, so it may be possible that there is a uniform demand for post-baccalaureate training that is unique to local and regional needs.

Although the findings of the aspects for Hypothesis 2 did not provide evidence to support mimetic isomorphic change that does not necessarily mean that isomorphic change is not occurring. Hypothesis 1 revealed that there appear to be trends toward homogenization among the aspects of this analysis. The analysis of Hypothesis 1 also revealed that if there was a trend toward homogenization that it would occur very slowly as the rates of change are very small for each variable. Further, the research universities are not static and continue to change as well at about the same rates, or greater in the case of research expenditures, than the non-research universities. This equity in change rates between the non-research and research groups further handicaps the non-research group and effectively prevents them from catching up to the research group.

In sum, the non-research group is not becoming like the research group and this provides no evidence in support of mimetic isomorphic change. The next sub-section reports the findings for Hypothesis 3. This hypothesis considers the same variables, but does so by comparing the research group to sub-groups within the non-research group; the system group and non-system group. This was done in order to determine if being a member of a university system has an impact on institutions mimicking the practices of the research universities.

5.1.4 Findings for Hypothesis 3

Hypothesis 3 is as follows: Public universities in Texas that are members of multi-campus university systems will, through time, resemble research/flagship universities less than non-members of multi-campus university system in regards to:

a. Duplicated programs;
b. Proportion of advanced degrees (master's and doctoral) offered;
c. Acceptance rate of first-time freshman applicants;
d. Rate of freshman applicants from top 10% of high school graduating class; and
e. Research expenditures per FT/FTE-T/TT faculty member.

Mimetic isomorphism change predicts that institutions will become more homogenous over time as institutions mimic the most successful institutions; however, as discussed in Chapter 2, one of the key functions of a multi-campus system is to promote institutional diversity. If the multi-campus systems are doing this, then it is expected that institutions that are part of a multi-campus system will be less homogeneous than institutions that are not part of a multi-campus system. Hypothesis 3 is intended to test whether institutions from multi-campus systems are becoming like the research institutions to a greater or lesser extent than institutions that are not part of a multi-campus system. The institutional data pertaining to each variable was aggregated into three comparative groups; the research group, the system group and the non-system group.

The research group consists of the same two institutions that were included in the analysis of Hypothesis 2. The system group is comprised of Angelo, Lamar, PVAM, SHSU, Tarleton, TAMIU, TAMUC, TAMUK, TAMUCM, TX State, UTA, UTB, UTEP, UTSA, UTT, UTPA, and WTAMU. The non-system group is comprised of Midwestern, SFA, TX Southern, TTU, TWU, and UNT.[23] The findings from the analysis of Hypothesis 3 are organized according the subsections of the statement, i.e. program duplications; proportion of advanced degrees; acceptance rate of freshman applicants; top 10% applicant rate; and research expenditures. A summary and interpretation of findings follows the presentation of the results for program duplications and graduate level programs. Interpretations of findings for the other aspects of the analyses are contained with the same section as the description of the findings. The sub-section concludes with a summary of all key findings for Hypothesis 3.

5.1.4.1 Program Duplications

5.1.4.1.1 All degree levels

When considering all programs together, regardless of degree level, the three groups' program duplications differ considerably from one another. In comparing the rates of the groups, the system group had 43% to 54% higher program duplication rates over time than the research group; the non-system group had 17% to 42% higher program duplication rates over time than the research group; and the system group had 5% to 23% higher duplication rates over time than the non-system group. All groups were found to have increases in program duplication rates. The system group's rates increased by an

[23] See Chapter 3 for a full explanation of how institutions were sorted into the research, system and non-system groups.

average of .39% per year, the non-system group's rates increased by an average of 1.33% per year, and the research group's rates increased by an average of .21% per year. The system group had program duplication rates that ranged over time from 68% to 73%, which are the highest levels out of the three groups. The non-system had program duplications that ranged over time from 53% to 68 %, which makes the non-system group notable for having the widest range of duplication rates. The research group had program duplication rates that ranged over time from 47% to 50%, which are the lowest among the three groups and the least variable. Two-tailed z-tests were conducted to compare the duplication rates between the system and research groups; the non-system and research groups; and the system and non-system groups. A z-test was run for each of the five, five year intervals to determine if there were statistically significant differences between the program duplication rates among the three groups.

The results of the z-tests confirmed the three groups are different from one another. The z-tests revealed that there were statistically significant differences in the duplication rates between the system and research groups (all five tests at $p < .001$); the non-system and research groups (one test at $p < .01$ and four at $p < .001$); and the system and non-systems groups (all five tests at $p < .001$). Based on these findings, it is concluded that neither the system nor the non-system group has become like the research group in terms of program duplications. Also, the findings indicate that the system and non-system groups are not like one another either. All three are distinct groups from one another in terms of program duplications for all program levels combined. Tables 5.41, 5.42, and 5.43 contain the number of programs, number of duplications, and duplication rates for each of the three comparisons as well as the z statistic. Table 5.43 contains this information for the comparison of the system and research groups; Table 5.44 for the non-system and research groups; and Table 5.45 for the system and non-system groups.

Table 5.43 Two-tailed Z-test Results from Comparison of Duplication Rates for System and Research Groups for All Degree Levels Combined

Year	Group	Number of Programs	Number of Duplications	Proportion Duplications	z statistic
1990	System	2374	1607	68%	10.41***
	Research	762	356	47%	
1995	System	2247	1571	70%	12.43***
	Research	785	354	45%	
2000	System	2315	1649	71%	11.17***
	Research	802	397	50%	
2005	System	2242	1622	72%	12.79***
	Research	836	399	48%	
2010	System	2310	1681	73%	12.66***
	Research	842	410	49%	

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

Table 5.44 Two-tailed Z-test Results from Comparison of Duplication Rates for Non-system and Research Groups for All Degree Levels Combined

Year	Group	Number of Programs	Number of Duplications	Proportion Duplications	z statistic
1990	Non-System	1463	781	53%	2.98**
	Research	762	356	47%	
1995	Non-System	1236	702	57%	5.13***
	Research	785	354	45%	
2000	Non-System	1195	727	61%	5.01***
	Research	802	397	50%	
2005	Non-System	1111	666	60%	5.36***
	Research	836	399	48%	
2010	Non-System	1024	699	68%	8.57***
	Research	842	410	49%	

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

Table 5.45 Two-tailed Z-test Results for Comparison of Duplication Rates for System and Non-system Groups from All Degree Levels Combined

Year	Group	Number of Programs	Number of Duplications	Proportion Duplications	z statistic
1990	System	2374	1607	68%	8.88***
	Non-System	1463	781	53%	
1995	System	2247	1571	70%	7.78***
	Non-System	1236	702	57%	
2000	System	2315	1649	71%	6.24***
	Non-System	1195	727	61%	
2005	System	2242	1622	72%	7.26***
	Non-System	1111	666	60%	
2010	System	2310	1681	73%	2.66**
	Non-System	1024	699	68%	

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

5.1.4.1.2 Bachelor degree level

When considering bachelor level programs, the three groups' program duplications also differ from one another, but not to the same extent as when all programs combined were examined. In comparing the rates of the groups, the system group had 29% to 45% higher program duplication rates over time than the research group; the non-system group had 11% to 40% higher program duplication rates over time than the research group; and the system group had 4% to 16% higher duplication rates over time than the non-system group. The system and non-system groups were found to have increases in program duplication rates, but the research group had an average annual decrease in duplication rates. The system group's rates increased by an average of .47% per year, the non-system group's rates increased by an average of 1.12% per year, and the research group's rates decreased by an average of .14% per year. The system group had program duplication rates that ranged from 71% to 77%, which are the highest levels out of the three groups. The non-system had program duplications that ranged from 59% to 73%, which again makes the non-system group notable for having the widest range of duplication rates. The research group had the lowest and least variable program duplication rates that ranged from 52% to 56%. Two-tailed z-tests were conducted to compare the duplication rates between the system and research groups; the non-system and research groups; and the system and non-system groups. A z-test was run for each of the five, five year intervals to determine if there were statistically significant differences between the program duplication rates among the three groups.

The results of the z-tests indicated statistically significant differences for almost all of the comparisons. Specifically, the z-tests revealed statistically significant differences in the duplication rates between the system and research groups (all five tests at $p < .001$). There was not a statistically significant difference in duplication rates between the non-system and research groups for the first of the five, five year intervals, but statistically significant differences appeared in the 1995 analysis and persisted throughout the remaining three analyses (one test at $p < .05$ and three at $p < .001$). The opposite situation was discovered when the system and non-systems groups were compared. There were statistically significant differences between the two groups for the first four analyses (one test at $p < .01$ and one test at $p < .001$), but not in the final analysis. Based on these findings, it is concluded that neither the system nor the non-system group have become like the research group in terms of program duplications. In fact, the non-system group became dissimilar from the research group during the first part of the study and the difference was maintained throughout the remainder of the study.

The system and non-system groups did, however, become like one another near the end of the study time period and this was due to the non-system group having greater increases in bachelor level program duplication rates. Tables 5.46, 5.47, and 5.48 contain the number of programs, number of duplications, and duplication rates for each of the three comparisons as well as the z statistic. Table 5.46 contains this information for the comparison of the system and research groups; Table 5.47 for the non-system and research groups; and Table 5.48 for the system and non-system groups.

Table 5.46 Two-tailed Z-test Results from Comparison of Duplication Rates for System and Research Groups for Bachelor Level Programs

Year	Group	Number of Programs	Number of Duplications	Proportion Duplications	z statistic
1990	System	1415	1001	71%	5.19***
	Research	264	144	55%	
1995	System	1260	945	75%	7.50***
	Research	267	139	52%	
2000	System	1272	963	76%	6.80***
	Research	279	155	56%	
2005	System	1188	900	76%	7.60***
	Research	291	155	53%	
2010	System	1206	931	77%	8.33***
	Research	296	157	53%	

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

Table 5.47 Two-tailed Z-test Results from Comparison of Duplication Rates for Non-system and Research Groups for Bachelor Level Programs

Year	Group	Number of Programs	Number of Duplications	Proportion Duplications	z statistic
1990	Non-System	679	401	59%	1.26
	Research	264	144	55%	
1995	Non-System	559	359	64%	3.34***
	Research	267	139	52%	
2000	Non-System	535	345	64%	2.48*
	Research	279	155	56%	
2005	Non-System	486	323	66%	3.66***

Table 5.47 – *Continued*

	Research	291	155	53%	
2010	Non-System	475	347	73%	5.68***
	Research	296	157	53%	

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

Table 5.48 Two-tailed Z-test Results from Comparison of Duplication Rates for System and Non-system Groups for Bachelor Level Programs

Year	Group	Number of Programs	Number of Duplications	Proportion Duplications	z statistic
1990	System	1415	1001	71%	5.32***
	Non-System	679	401	59%	
1995	System	1260	945	75%	4.71***
	Non-System	559	359	64%	
2000	System	1272	963	76%	4.87***
	Non-System	535	345	64%	
2005	System	1188	900	76%	3.89**
	Non-System	486	323	66%	
2010	System	1206	931	77%	1.79
	Non-System	475	347	73%	

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

5.1.4.1.3 Master's degree level

When considering master's level programs, the three groups' program duplications also differ from one another, but to a greater extent than what was observed among bachelor level programs. In comparing the rates of the groups, the system group had 42% to 61% higher program duplication rates over time than the research group; the non-system group had 16% to 45% higher program duplication rates over time than the research group; and the system group had 13% to 26% higher duplication rates over time than the non-system group. The system and non-system groups were found to have increases in program duplication rates, but the research group had an average annual decrease in duplication rates. The system group's rates increased by an average of .38%

per year, the non-system group's rates increased by an average of 1.22% per year, and the research group's rates decreased by an average of .04% per year. The system group had program duplication rates that ranged from 65% to 70%, which are the highest levels of out of the three groups. The non-system group had program duplications rates that ranged from 52% to 65%. The research group had the lowest, but most variable program duplication rates that ranged from 44% to 66%. Two-tailed z-tests were conducted to compare the duplication rates between the system and research groups; the non-system and research groups; and the system and non-system groups. A z-test was run for each of the five, five year intervals to determine if there were statistically significant differences between the program duplication rates among the three groups.

The results of the z-tests indicate there were statistically significant differences for most all of the comparisons. Specifically, the z-tests revealed that duplication rates between the system and research groups were significantly statistically different (all five tests at $p < .001$). There was not a statistically significant difference in duplication rates between the non-system and research groups for the first of the five, five year intervals, but statistically significant difference appeared in the 1995 analysis and persisted throughout the remaining three analyses (two tests at $p < .01$ and two at $p < .001$). The opposite situation was discovered when the system and non-systems groups were compared. There were statistically significant differences between the two groups for the first four analyses (all tests at $p < .001$), but not in the final analysis. Based on these findings, it is concluded that neither the system nor the non-system group have become like the research group in terms of master's level program duplications. In fact, the non-system group became dissimilar from the research group during the first part of the study and the difference was maintained throughout the remainder of the study. The system and non-system groups did, however, become like one another near the end of the study and this was due to the non-system group having greater increases in program duplication rates. Tables 5.49, 5.50, and 5.51 contain the number of programs, number of duplications, and duplication rates for each of the three comparisons as well as the z statistic. Table 5.49 contains this information for the comparison of the system and research groups; Table 5.50 for the non-system and research groups; and Table 5.51 for the system and non-system groups.

Table 5.49 Two-tailed Z-test Results from Comparison of Duplication Rates for System and Research Groups for Master's Level Programs

Year	Group	Number of Programs	Number of Duplications	Proportion Duplications	z statistic
1990	System	859	557	65%	5.67***
	Research	276	126	46%	
1995	System	894	585	65%	6.24***
	Research	290	130	45%	
2000	System	937	640	68%	7.21***
	Research	299	135	45%	
2005	System	911	641	70%	8.51***
	Research	322	141	44%	
2010	System	952	663	70%	7.82***
	Research	320	145	45%	

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

Table 5.50 Two-tailed Z-test Results from Comparison of Duplication Rates for Non-system and Research Groups for Master's Level Programs

Year	Group	Number of Programs	Number of Duplications	Proportion Duplications	z statistic
1990	Non-System	549	286	52%	1.75
	Research	276	126	46%	
1995	Non-System	495	269	54%	2.57**

Table 5.50 – *Continued*

	Research	290	130	45%	
2000	Non-System	496	292	59%	3.76***
	Research	299	135	45%	
2005	Non-System	464	255	55%	3.08**
	Research	322	141	44%	
2010	Non-System	405	265	65%	5.43***
	Research	320	145	45%	

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

Table 5.51 Two-tailed Z-test Results from Comparison of Duplication Rates for System and Non-system Groups for Master's Level Programs

Year	Group	Number of Programs	Number of Duplications	Proportion Duplications	z statistic
1990	System	859	557	65%	4.76***
	Non-System	549	286	52%	
1995	System	894	585	65%	4.07***
	Non-System	495	269	54%	
2000	System	937	640	68%	3.56***
	Non-System	496	292	59%	
2005	System	911	641	70%	5.67***
	Non-System	464	255	55%	
2010	System	952	663	70%	1.53
	Non-System	405	265	65%	

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

5.1.4.1.4 Doctoral degree level

When considering doctoral level programs, the three groups' program duplications differ from one another, but to a noticeably lesser extent than what was observed among the other degree levels. In comparing the rates of the groups, the system group had rates over time that were, in some cases, 9% lower than the rates of the research group, but in other cases, up to 26% higher; the non-system group had 3% to 26% higher program duplication rates over time than the research group; and the system group also had rates over time that were, in some cases, 2% lower than the rates of the non-system group, but in other cases, up to 32% higher than the non-system group. All three groups were found to have increases in program duplication rates. The system group's rates increased by an average of .84% per year, the non-system group's rates increased by an average of 1.17% per year, and the research group's rates decreased by an average of 2.55% per year.

The system group had program duplication rates that ranged from 65% to 70%. The non-system group had duplication rates that ranged from 40% to 60%, which was the greatest growth in program duplications and the highest duplication rates among the three groups. The research group had the lowest and least variable program duplication rates that ranged from 37% to 48%. Two-tailed z-tests were conducted to compare the duplication rates between the system and research groups; the non-system and research groups; and the system and non-system groups. A z-test was run for each of the five, five year intervals to determine if there were statistically significant differences between the program duplication rates among the three groups.

The results of the z-tests indicate there are almost no differences in program duplication rates among the three groups at the doctoral level. The z-tests revealed there were no statistically significant differences in the duplication rates of the system and research groups. There was not a statistically significant difference in duplication rates between the non-system and research groups for the first four of the five, five year intervals, but a statistically significant difference appeared in 2010 ($p < .05$). There were also no statistically significant differences between the between the system and non-system groups. Based on these findings, it is concluded that neither the system nor the non-system groups have become like the research group in terms of doctoral level program duplications. The system group remained like the research group throughout the course of the study. The non-system group became dissimilar from the research group during the last part of the study. The system and non-system groups remained like one another throughout the course of the study. The lack of differences appears to be related in large measure to the research group keeping pace with the system and non-system groups in terms of program duplication rates. Tables 5.52, 5.53, and 5.54 contain the number of programs, number of duplications, and duplication rates for each of the three comparisons as well as the z statistic. Table 5.51 contains this information for the comparison of the system and research groups; Table 5.52 for the non-system and research groups; and Table 5.53 for the system and non-system groups.

Table 5.52 Two-tailed Z-test Results from Comparison of Duplication Rates for System and Research Groups for Doctoral Level Programs

Year	Group	Number of Programs	Number of Duplications	Proportion Duplications	z statistic
1990	System	100	49	49%	1.73
	Research	222	86	39%	
1995	System	93	41	44%	1.13
	Research	228	85	37%	
2000	System	106	46	43%	-0.74
	Research	224	107	48%	
2005	System	143	81	57%	1.95
	Research	223	103	46%	
2010	System	152	87	57%	1.80
	Research	226	108	48%	

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

Table 5.53 Two-tailed Z-test Results from Comparison of Duplication Rates for Non-system and Research Groups for Doctoral Level Programs

Year	Group	Number of Programs	Number of Duplications	Proportion Duplications	z statistic
1990	Non-System	235	94	40%	0.28
	Research	222	86	39%	
1995	Non-System	182	74	41%	0.70
	Research	228	85	37%	
2000	Non-System	164	90	55%	1.38
	Research	224	107	48%	
2005	Non-System	161	88	55%	1.64
	Research	223	103	46%	
2010	Non-System	144	87	60%	2.37*
	Research	226	108	48%	

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

Table 5.54 Two-tailed Z-test Results from Comparison of Duplication Rates for System and Non-system Groups for Doctoral Level Programs

Year	Group	Number of Programs	Number of Duplications	Proportion Duplications	z statistic
1990	System	100	49	49%	1.52
	Non-System	235	94	40%	
1995	System	93	41	44%	0.55
	Non-System	182	74	41%	
2000	System	106	46	43%	-1.84
	Non-System	164	90	55%	
2005	System	143	81	57%	0.35
	Non-System	161	88	55%	
2010	System	152	87	57%	-0.56
	Non-System	144	87	60%	

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

5.1.4.1.5 Summary and interpretation of program duplications for Hypothesis 3

For all degree levels combined and for the bachelor and master's level, the system and non-system groups differ from the research group. The system and non-system groups had program duplications rates that differed significantly from those of the research group. The exception to this is at the doctoral level where there were no statistically significant differences between the system group and the research group. The non-system group was initially statistically indistinguishable from the research group until the last year of the analysis when it diverged significantly from the research group. These findings indicate that mimetic isomorphic changes are complicated by the same issue discussed for the program duplications aspect of Hypothesis 2; the unanticipated limitation of using program duplications rates to test the theory. As discussed previously, programmatically mimicking the research institutions will increase program homogeneity and duplication rates, which is what is predicted by mimetic isomorphic change. However, this will, in all likelihood, cause a divergence between the system or non-system group and the research group and in fact this is what was observed when all degree levels were combined and for the bachelor and master's program levels. Given this limitation, it is perhaps more meaningful to focus on the comparison of the system and non-system groups.

The system and non-system groups had statistically significant differences in program duplication rates when all degree levels were combined as well as for most of the years at the bachelor and master's level. For the bachelor and master's level, there were statistically significant differences between the groups because the system group had differentially higher duplication rates. However, by the last year of the analysis period, 2010, the non-system group's duplication rates increased to the point where the two groups were statistically indistinguishable. At the bachelor and master's level the system and non-system groups are different in most cases, but the most important point in relation to mimetic isomorphic change and multi-campus system membership is that the system group had significantly higher program duplication rates than the non-system group for most years of the analysis. This indicates that system membership did not have an impact on lowering homogeneity or controlling program duplication among its constituent institutions. Further, the system and non-system groups did become statistically indistinguishable, but not because the system group’s level of homogeneity dropped, but because the non-system group’s level of homogeneity increased.

The doctoral program level is quite different from the bachelor and master’s level in that the system group’s program duplication rates are not significantly different from the research group’s duplication rates. The non-system group was also indistinguishable from the research group until 2010 when it diverged to the point of statistical significance. There were also no statistically significant differences between the system and non-system groups doctoral duplication rates. The divergence of the non-system group from the research group is expected under the predictions of mimetic isomorphic change, but since there are no statistically significant differences in duplication rates between the system and non-system group, it begs the question of what the implications are for the system group. The logic of the data suggests that the system group may not be far behind in differing significantly from the research group and this would indicate that multi-campus system membership does not have an effect on controlling program homogenization. In fact, the system group’s duplication rates were only lower than the non-system’s rates for two out of the five, five-year intervals. In sum, multi-campus system membership does not have an impact on levels of programmatic homogenization of its constituent institutions.

5.1.4.2 Graduate Level Program Proportions

5.1.4.2.1 Master's level programs

Recall that master's level program proportion is the percent of total programs that are master's. When considering master's level programs, the three groups' program proportions differ little from one another. In comparing the proportions of the groups, the system group had program proportions that were.08% to 9% higher than the research group's proportions; the non-system group had program proportions that were 3% to 10% higher than the research group's proportions; and the system group had program proportions that were 3% less than and up to 5% greater than the non-system group's proportions. All three groups were found to have small increases in program proportions. The system group's proportions increased the most out of the three by an average of .70% per year, while the non-system and research groups' proportions increased by almost the same amount, an average of .28% and .25% per year, respectively. The system group had program proportions that ranged from 36% to 41%. The non-system group had proportions that ranged from 38% to 42%. The research group program proportions that ranged from 36% to 38%. Two-tailed z-tests were conducted to compare program proportions between the system and research groups; the non-system and research groups; and the system and non-system groups. A z-test was run for each of the five, five year intervals to determine if there were statistically significant differences between the program proportions among the three groups.

The results of the z-tests confirmed that program proportions for the three groups at the master's level differ little from one another. Specifically, the z-tests revealed that there were no statistically significant differences in proportions between any of the three groups for any of the years tested. Based on these findings, it is clear that the system and non-system groups are like the research group and the system and non-system groups are also like one another. In all cases, these groups were already like one another at the beginning of the study period and maintained their similarity in terms of master's level program proportions throughout the course of the study. Tables 5.55, 5.56, and 5.57 contain the total number of programs, the total number of master's programs, and proportions of master's programs for each of the three comparisons as well as the z statistic. Table 5.55 contains this information for the comparison of the system and research groups; Table 5.56 for the non-system and research groups; and Table 5.57 for the system and non-system groups.

Table 5.55 Two-tailed Z-test Results from Comparison of Master's Level Program Proportions for System and Research Groups

Year	Group	Total Programs	Master's Programs	Proportions Master's Programs	z statistic
1990	System	2374	859	36%	-0.02
	Research	762	276	36%	
1995	System	2247	894	40%	1.41
	Research	785	290	37%	
2000	System	2315	937	40%	1.59
	Research	802	299	37%	
2005	System	2242	911	41%	1.07
	Research	836	322	39%	
2010	System	2310	952	41%	1.62
	Research	842	320	38%	

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

Table 5.56 Two-tailed Z-test Results from Comparison of Master's Level Program Proportions for Non-system and Research Groups

Year	Group	Total Programs	Master's Programs	Proportions Master's Programs	z statistic
1990	Non-System	1463	549	38%	0.60
	Research	762	276	36%	
1995	Non-System	1236	495	40%	1.40
	Research	785	290	37%	
2000	Non-System	1195	496	42%	1.89
	Research	802	299	37%	
2005	Non-System	1111	464	42%	1.45
	Research	836	322	39%	
2010	Non-System	1024	405	40%	0.68
	Research	842	320	38%	

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

Table 5.57 Two-tailed Z-test Results from Comparison of Master's Level Program Proportions for System and Non-system Groups

Year	Group	Total Programs	Master's Programs	Proportions Master's Programs	z statistic
1990	System	2374	859	36%	-0.84
	Non-System	1463	549	38%	
1995	System	2247	894	40%	-0.15
	Non-System	1236	495	40%	
2000	System	2315	937	40%	-0.59
	Non-System	1195	496	42%	
2005	System	2242	911	41%	-0.63
	Non-System	1111	464	42%	
2010	System	2310	952	41%	0.90
	Non-System	1024	405	40%	

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

5.1.4.2.2 Doctoral level programs

When considering doctoral level programs, the three groups' program proportions differ completely from one another. In comparing the proportions of the groups, the system group had program proportions that were 75% to 85% lower than the research group's proportions; the non-system group had program proportions that were 47% to 54% lower than the research group's proportions; and the system group had program proportions that were 48% to 72% lower than the non-system group's proportions. The system group was the only one of the three groups to have an increase in doctoral proportions, which increased by an average of 2.84% per year. The non-system and research groups had decreases in doctoral program proportions. The non-system group's proportions decreased by an average of .39% per year, while the research group's proportions decreased by an average of .74% per year. The system group had the lowest doctoral programs proportions that ranged from 4% to 7%. The non-system group had proportions that ranged from 14% to 16%. The non-system group had the highest doctoral program proportions with rates that ranged from 27% to 29%. Two-tailed z-tests were conducted to compare the proportions between the system and research groups; the non-system and research groups; and the system and non-system groups. A z-test was run for each of the five, five year intervals to determine if there were statistically significant differences between the program proportions among the three groups.

The results of the z-tests confirmed that the program proportions are different for the three groups at the doctoral level. Specifically, the z-tests revealed that there were statistically significant differences in the proportions of the system and research groups (all tests at $p < .001$). This was also the case for the comparison of proportions for the non-system and research groups (all tests also at $p < .001$) as well as for the comparison for system and non-system groups (all tests also at $p < .001$). Based on these findings, it is concluded that neither the system nor the non-system groups have become like the research group in terms of doctoral level program proportions. Further, the system group is not becoming like the non-system group either. Tables 5.58, 5.59, and 5.60 contain the total number of programs, total number of doctoral programs, and doctoral proportions for each of the three comparisons as well as the z statistic. Table 5.58 contains this information for the comparison of the system and research groups; Table 5.59 for the non-system and research groups; and Table 5.60 for the system and non-system groups.

Table 5.58 Two-tailed Z-test Results from Comparison of Doctoral Level Program Proportions for System and Research Groups

Year	Group	Total Programs	Doctoral Programs	Proportion Doctoral Programs	z statistic
1990	System	2374	100	4%	-19.72***
	Research	762	222	29%	
1995	System	2247	93	4%	-19.52***
	Research	785	228	29%	
2000	System	2315	106	5%	-18.52***
	Research	802	224	28%	
2005	System	2242	143	6%	-15.47***
	Research	836	223	27%	
2010	System	2310	152	7%	-15.49***
	Research	842	226	27%	

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

Table 5.59 Two-tailed Z-test Results from Comparison of Doctoral Level Program Proportions for Non-system and Research Groups

Year	Group	Total Programs	Doctoral Programs	Proportion Doctoral Programs	z statistic
1990	Non-System	1463	235	16%	-7.24***
	Research	762	222	29%	
1995	Non-System	1236	182	15%	-7.80***
	Research	785	228	29%	
2000	Non-System	1195	164	14%	-7.87***
	Research	802	224	28%	

Table 5.59 – *Continued*

2005	Non-System	1111	161	14%	-6.69***
	Research	836	223	27%	
2010	Non-System	1024	144	14%	-6.89***
	Research	842	226	27%	

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

Table 5.60 Two-tailed Z-test Results from Comparison of Doctoral Level Program Proportions for System and Non-system Groups

Year	Group	Total Programs	Doctoral Programs	Proportion Doctoral Programs	z statistic
1990	System	2374	100	4%	-12.63***
	Non-System	1463	235	16%	
1995	System	2247	93	4%	-11.09***
	Non-System	1236	182	15%	
2000	System	2315	106	5%	-9.63***
	Non-System	1195	164	14%	
2005	System	2242	143	6%	-7.70***
	Non-System	1111	161	14%	
2010	System	2310	152	7%	-7.01***
	Non-System	1024	144	14%	

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

5.1.4.2.3 Summary and interpretation graduate level proportions

The findings and interpretation of the findings for master's and doctoral proportions are very much like those of Hypothesis 2. There were no statistically significant differences in master's level proportions for the system group vis-à-vis the research group; for the non-system group vis-à-vis the research group; and the system group vis-à-vis the non-system group. As in the case of Hypothesis 2, this should not be interpreted as the two becoming alike as the groups were already alike and continued to be over the course of the study. For the doctoral programs, however, there is no evidence of likeness between the three groups. There were statistically significant differences between the doctoral proportions of the system and research groups, of the non-system and research groups, and of the system and non-system groups. So, the system and non-system groups did not become like the research group at either degree level nor did the system and non-system groups become like one another at either degree level.

These findings do not suggest the mimetic isomorphic forces were at work as there was no change in the comparisons of the groups at both the master's and doctoral levels. However, it is possible that mimetic isomorphic forces brought about the homogeneity of master's level proportions prior to the study time period. Further, it is possible that mimetic isomorphic forces were at work without resulting in observable homogeneity. The findings from Hypothesis 1 revealed that there was a trend towards homogenization of proportions at the doctoral level, but that the institutional rates of change were incredibly small, so homogenization would like occur very slowly. Taking into consideration the findings of Hypothesis 1, it is reasonable that homogenization is occurring, but not in a consequential fashion.

In sum and to take this back to the question of the implication of multi-campus system membership on graduate level program proportion homogenization, the findings indicate that multi-campus system membership had no effect during the course of this study on the level of homogenization for master's level program proportions. However, at the doctoral level, the multi-campus system's role in discourage or preventing homogenization is unclear. Although the system group has the lowest levels of doctoral proportions, which suggests that the group is not mimicking the research group (or at least not at the same level as the non-system group), it also has the highest average annual percent increase in doctoral proportions, while the non-system and research groups had average decreases in doctoral program proportions.

5.1.4.3 Research Expenditures per FT/FTE-T/TT Faculty Member

When considering average research expenditures among the three groups, there are some distinct differences and some similarities. The system group spent 81% to 92% less in research expenditures over time than the research group. The non-system group spent 89% to 94% less in research expenditures overs time than the research group. When comparing the expenditures of the system group to the non-system group over time, the system group, in some years, spent less than the non-system group (up to 4% less) and in other years, spent up to 133% more than the non-system group. All three groups had increases in research expenditures over the course of the study. The system group increased expenditures the most by an average of 12% per year. The non-system group increased expenditures by an average of 6% per year and the research group increased expenditures even less by an average of 3% per year. Although there were differences between the expenditures of the system and non-system groups, the range of their average expenditures per year were not too disparate. The system group's average expenditures ranged from $9,971 to $35,852 and the non-system group's average expenditures ranged from $9,981 to $22,809. However, the system group steadily increased expenditures over the 21 fiscal years of the study period, while the non-system group's expenditures were more randomized. The research group out spent both of the other groups with average expenditures that ranged from $129,313 to $210,522. Two-tailed z-tests were conducted to determine if statistically significant differences could be found when comparing the expenditures of the system and research groups; the non-system and research groups; and the system and non-system groups. A z-test was run for each of the 21 fiscal years for each of the three comparisons.

The results of the z-tests indicate there were statistically meaningful differences when the average expenditures of the three groups were compared. Specifically, the z-tests revealed statistically significant differences in the average expenditures of the system and research groups (all tests at $p < .001$). This was also the case for the comparison of average expenditures for the non-system and research groups (all tests also at $p < .001$). However, there were no statistically significant differences in expenditures between the system and non-system groups except for fiscal year 2008 (significantly different at $p < .05$). Based on these findings, it is concluded that neither the system nor the non-system groups have become like the research group in terms of research expenditures. Further, the system group is not becoming like the non-system group as the groups maintained their likeness throughout virtually the entire study period. The single incidence of significant difference is not adequate to conclude that the groups are not like one another.

The statistical analysis of research expenditures indicates that multi-campus system membership had no differential effect on the system group in comparison to the non-system group as there are almost no statistically significant differences between the system and non-system groups and neither group became statistically like the research group. The average annual percent changes in expenditures indicate, on a practical level, that the system group is mimicking the research group to a greater extent than the non-system group. The research group was also increasing expenditures and this coupled with their already substantially larger amount of expenditures made it virtually impossible for the either the system or non-system to catch up to the research group. Regardless, the findings suggest that mimetic isomorphic change could be at work and that multi-campus system membership is a not a factor in controlling or minimizing expenditures to any degree greater than what is observed for the non-system group. Tables 5.61, 5.62, and 5.63 contain the number of universities in the each group, the average research expenditures of each of the groups being compared as well as the group variance and the z score. Specifically, Table 5.61 contains this information for the comparison of the system and research groups; Table 5.62 for the non-system and research groups; and Table 5.63 for the system and non-system groups.

Table 5.61 Two-tailed Z-test Results from the Comparison of Research Expenditures for System and Research Groups

Fiscal Year	Group	n[1]	Average Research Expenditures per FT/FTE-T/TT Faculty[2]	Group Variance	z score
1990	System	18	$9,971	163957148.74	-3.70***
	Research	2	$130,433	2096832235.51	
1991	System	18	$10,479	148528827.53	-4.34***
	Research	2	$133,471	1589027006.31	
1992	System	18	$12,762	223653804.65	-3.34***
	Research	2	$140,021	2871875706.72	
1993	System	18	$16,406	298061663.57	-5.36***
	Research	2	$161,827	1438836490.37	
1994	System	18	$13,444	208757462.06	-5.48***
	Research	2	$129,313	871929524.33	
1995	System	18	$15,517	269075935.15	-4.57***
	Research	2	$149,717	1692754097.03	
1996	System	18	$17,015	354313709.06	-4.87***
	Research	2	$150,889	1473287935.51	
1997	System	18	$17,273	351664409.56	-3.91***
	Research	2	$168,634	2959228906.92	
1998	System	18	$15,504	244928495.18	-8.30***
	Research	2	$131,699	365069953.52	

Table 5.61 - *Continued*

1999	System	18	$14,639	247520531.07	-8.62***
	Research	2	$147,589	448352410.06	
2000	System	18	$18,075	297852254.43	-16.77***
	Research	2	$153,529	97406957.83	
2001	System	18	$21,140	326662627.97	-19.48***
	Research	2	$163,545	70567635.28	
2002	System	18	$23,962	475666357.28	-28.66***
	Research	2	$172,202	658475.75	
2003	System	18	$23,786	532599667.66	-24.53***
	Research	2	$168,531	10466452.84	
2004	System	18	$24,008	437227186.12	-13.06***
	Research	2	$165,491	186141156.35	
2005	System	18	$26,426	597491331.31	-13.02***
	Research	2	$171,719	182514252.58	
2006	System	18	$27,237	596760460.57	-18.92***
	Research	2	$172,141	50961605.53	
2007	System	18	$27,245	560819912.80	-24.54***
	Research	2	$170,388	5712055.58	
2008	System	18	$31,005	875248520.26	-20.41***
	Research	2	$189,145	22803847.51	
2009	System	18	$34,807	907992257.76	-11.91***
	Research	2	$179,122	192576284.57	
2010	System	18	$35,852	1033513818.42	-5.96***
	Research	2	$210,522	1602195996.45	

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

[1] n = number of universities in group

[2] All dollar amounts in constant 1990 dollars

Table 5.62 Two-tailed Z-test Results from the Comparison of Research Expenditures for Non-system and Research Groups

Fiscal Year	Group	n[1]	Average Research Expenditures per FT/FTE-T/TT Faculty[2]	Group Variance	z score
1990	Non-System	6	$9,981	106268985.36	-3.69***
	Research	2	$130,433	2096832235.51	
1991	Non-System	6	$10,879	97801532.83	-4.31***
	Research	2	$133,471	1589027006.31	
1992	Non-System	6	$12,694	119781263.65	-3.34***
	Research	2	$140,021	2871875706.72	
1993	Non-System	6	$11,193	114936364.50	-5.54***
	Research	2	$161,827	1438836490.37	
1994	Non-System	6	$9,798	85994135.37	-5.63***
	Research	2	$129,313	871929524.33	
1995	Non-System	6	$13,154	120424509.03	-4.64***
	Research	2	$149,717	1692754097.03	

Table 5.62 – *Continued*

1996	Non-System	6	$13,336	133135812.48	-4.99***
	Research	2	$150,889	1473287935.51	
1997	Non-System	6	$14,262	168296486.27	-3.98***
	Research	2	$168,634	2959228906.92	
1998	Non-System	6	$13,033	170877145.55	-8.17***
	Research	2	$131,699	365069953.52	
1999	Non-System	6	$9,421	28082639.27	-9.13***
	Research	2	$147,589	448352410.06	
2000	Non-System	6	$15,374	234329229.20	-14.75***
	Research	2	$153,529	97406957.83	
2001	Non-System	6	$15,055	206761621.81	-17.78***
	Research	2	$163,545	70567635.28	
2002	Non-System	6	$17,808	263980109.23	-23.19***
	Research	2	$172,202	658475.75	
2003	Non-System	6	$16,682	260024382.07	-21.79***
	Research	2	$168,531	10466452.84	
2004	Non-System	6	$14,339	178737640.72	-13.64***
	Research	2	$165,491	186141156.35	
2005	Non-System	6	$14,956	177336335.13	-14.26***
	Research	2	$171,719	182514252.58	
2006	Non-System	6	$14,666	164470503.09	-21.65***
	Research	2	$172,141	50961605.53	
2007	Non-System	6	$13,362	154173016.93	-29.39***
	Research	2	$170,388	5712055.58	
2008	Non-System	6	$13,318	151639308.57	-29.03***
	Research	2	$189,145	22803847.51	
2009	Non-System	6	$18,715	427339449.37	-12.39***
	Research	2	$179,122	192576284.57	
2010	Non-System	6	$22,809	928709045.27	-6.07***
	Research	2	$210,522	1602195996.45	

Note 1: * significant at < .05; ** significant at < .01; *** significant at < .001

[1] n = number of universities in group

[2] All dollar amounts in constant 1990 dollars

Table 5.63 Two-tailed Z-test Results from the Comparison of Research Expenditures for System and Non-system Groups

Fiscal Year	Group	n[1]	Average Research Expenditures per FT/FTE-T/TT Faculty[2]	Group Variance	z score
1990	System	18	$9,971	163957148.74	-0.002
	Non-System	6	$9,981	106268985.36	
1991	System	18	$10,479	148528827.53	-0.08
	Non-System	6	$10,879	97801532.83	
1992	System	18	$12,762	223653804.65	0.01

Table 5.63 – *Continued*

	Non-System	6	$12,694	119781263.65	
1993	System	18	$16,406	298061663.57	0.87
	Non-System	6	$11,193	114936364.50	
1994	System	18	$13,444	208757462.06	0.72
	Non-System	6	$9,798	85994135.37	
1995	System	18	$15,517	269075935.15	0.40
	Non-System	6	$13,154	120424509.03	
1996	System	18	$17,015	354313709.06	0.57
	Non-System	6	$13,336	133135812.48	
1997	System	18	$17,273	351664409.56	0.44
	Non-System	6	$14,262	168296486.27	
1998	System	18	$15,504	244928495.18	0.38
	Non-System	6	$13,033	170877145.55	
1999	System	18	$14,639	247520531.07	1.22
	Non-System	6	$9,421	28082639.27	
2000	System	18	$18,075	297852254.43	0.36
	Non-System	6	$15,374	234329229.20	
2001	System	18	$21,140	326662627.97	0.84
	Non-System	6	$15,055	206761621.81	
2002	System	18	$23,962	475666357.28	0.73
	Non-System	6	$17,808	263980109.23	
2003	System	18	$23,786	532599667.66	0.83
	Non-System	6	$16,682	260024382.07	
2004	System	18	$24,008	437227186.12	1.31
	Non-System	6	$14,339	178737640.72	
2005	System	18	$26,426	597491331.31	1.45
	Non-System	6	$14,956	177336335.13	
2006	System	18	$27,237	596760460.57	1.62
	Non-System	6	$14,666	164470503.09	
2007	System	18	$27,245	560819912.80	1.84
	Non-System	6	$13,362	154173016.93	
2008	System	18	$31,005	875248520.26	2.06*
	Non-System	6	$13,318	151639308.57	
2009	System	18	$34,807	907992257.76	1.46
	Non-System	6	$18,715	427339449.37	
2010	System	18	$35,852	1033513818.42	0.90
	Non-System	6	$22,809	928709045.27	

Note 1: * significant at < .05; ** significant at < .01; *** significant at < .001

[1] n = number of universities in group

[2] All dollar amounts in constant 1990 dollars

5.1.4.4 First-time Freshmen Acceptance Rates

When considering first-time freshmen acceptance rates, the three groups have some notable differences. In comparing the groups, the system group had 11% to 33% higher acceptance rates than the research group; the non-system group had 5% to 37% higher acceptance rates than the research group; and the system group had 14% lower rates and up to 9% greater acceptance rates than the non-system group. All three groups were found to have decreases in their acceptance rates, which indicated the groups were becoming more selective in their admission decisions. The system group's acceptance rate decreased by an average of .71% per year, the non-system group's rates decreased by an average of .47% per year, and the research group's rates decreased by an average of .99% per year. The system group had acceptance rates that ranged from 76% to 89%. The non-system group had rates that ranged from 76% to 88%, which indicates there is little difference in the level of selectivity of the system and non-system groups. The research group had the lowest acceptance rates that ranged from 56% to 80%. Two-tailed z-tests were conducted to compare the acceptance rates of the system and research groups; the non-system and research groups; and the system and non-system groups. A z-test was run for each of the 13 years for which data was available to determine if there were statistically significant differences between the first-time freshmen acceptance rates among the three groups.

The results of the z-tests confirmed that there were differences and similarities between the groups. Specifically, the z-tests revealed that there were statistically significant differences in the acceptance rates between the system and research groups as well as the non-system and research groups (all tests at $p < .001$). There were statistically significant differences in acceptance rates between the system and non-system groups for all years until 2010, when the two groups became indistinguishable in their rates of selectivity (all statistically significant tests at $p < .001$). Based on these findings, it is concluded that neither the system nor the non-system groups have become like the research group in terms of level of selectivity. Further, for most of the time period for which data was available, the system and non-system groups were differentially selective and then, in the final year of analysis, the two groups became equally selective. From 1998 to 2005, the system group was less selective than the non-system group, then beginning in 2006; the system group became more selective than the non-system group. By 2010, the level of selectivity for both groups leveled out and the two groups became indistinguishable.

For most of the 13 years for which data was available, system membership appears to have been a possible factor in controlling for homogenization of levels of acceptance as the rates of acceptance were higher for the system group than for the non-system group. However, in 2006 there was a shift; the system group became more selective than the non-system group. The non-system group responded by becoming as selective as the system group and by 2010, both groups were equally selective and the most selective since 1998. Mimetic isomorphic forces do seem to be at work among the system and non-system groups and if the multi-campus systems were controlling for homogenization in the past, it does not appear they were doing so in the latter part of the 2000s. In sum, there is no difference between the system and non-system groups in terms of their course of selectivity. Although neither have become like the research group, both have become more like one another and are on a course of increasing selectivity. Tables 5.64, 5.65, and 5.66 contain the number of total applicants, the number of accepted applicants, and acceptance rates for each of the three comparisons as well as the z statistic. Table 5.64 contains this information for the comparison of the system and research groups; Table 5.65 the non-system and research groups; and Table 5.66 for the system and non-system groups.

Table 5.64 Two-tailed z-test Results from Comparison of Acceptance Rates for System and Research Groups

Year	Group	Total Applications	Number Accepted	Proportion Accepted	z statistic
1998	System	39620	35369	89%	49.41***
	Research	27410	20506	75%	
1999	System	37315	33256	89%	32.96***
	Research	29679	23740	80%	
2000	System	44807	38917	87%	32.74***
	Research	34129	26630	78%	
2001	System	51792	44904	87%	50.29***
	Research	32797	23901	73%	
2002	System	57748	49249	85%	60.87***
	Research	36456	25029	69%	
2003	System	64087	54674	85%	89.82***
	Research	38228	23144	61%	
2004	System	70216	60029	85%	74.89***
	Research	36818	24213	66%	
2005	System	70312	59123	84%	74.31***
	Research	38438	24706	64%	
2006	System	77215	62077	80%	54.54***
	Research	40937	27034	66%	
2007	System	81064	61239	76%	34.71***
	Research	42494	28150	66%	
2008	System	84344	65872	78%	72.25***
	Research	46396	27480	59%	

Table 5.64 – *Continued*

2009	System	91961	70293	76%	74.40***
	Research	50980	29344	58%	
2010	System	100907	76614	76%	67.31***
	Research	51748	30683	59%	

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

Table 5.65 Two-tailed Z-test Results from Comparison of Acceptance Rates for Non-system and Research Groups

Year	Group	Total Applications	Number Accepted	Proportion Accepted	z statistic
1998	Non-System	25827	21801	84%	27.41***
	Research	27410	20506	75%	
1999	Non-System	28211	23797	84%	13.70***
	Research	29679	23740	80%	
2000	Non-System	35015	28763	82%	13.56***
	Research	34129	26630	78%	
2001	Non-System	39143	32185	82%	30.13***
	Research	32797	23901	73%	
2002	Non-System	39893	32390	81%	40.07***
	Research	36456	25029	69%	
2003	Non-System	41254	32278	78%	54.27***
	Research	38228	23144	61%	
2004	Non-System	42426	33826	80%	44.29***
	Research	36818	24213	66%	
2005	Non-System	43430	35420	82%	55.88***
	Research	38438	24706	64%	
2006	Non-System	44930	38953	87%	71.68***
	Research	40937	27034	66%	
2007	Non-System	46237	40829	88%	78.91***
	Research	42494	28150	66%	
2008	Non-System	48045	38149	79%	67.31***
	Research	46396	27480	59%	
2009	Non-System	42816	33797	79%	69.52***
	Research	50980	29344	58%	
2010	Non-System	44690	34028	76%	55.53***
	Research	51748	30683	59%	

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

Table 5.66 Two-tailed Z-test Results from Comparison of Acceptance Rates for System and Non-system Groups

Year	Group	Total Applications	Number Accepted	Proportion Accepted	z statistic
1998	System	39620	35369	89%	18.28***
	Non-System	25827	21801	84%	
1999	System	37315	33256	89%	18.01***
	Non-System	28211	23797	84%	
2000	System	44807	38917	87%	18.39***
	Non-System	35015	28763	82%	
2001	System	51792	44904	87%	18.60***
	Non-System	39143	32185	82%	
2002	System	57748	49249	85%	16.97***
	Non-System	39893	32390	81%	
2003	System	64087	54674	85%	29.51***
	Non-System	41254	32278	78%	
2004	System	70216	60029	85%	25.14***
	Non-System	42426	33826	80%	
2005	System	70312	59123	84%	11.07***
	Non-System	43430	35420	82%	
2006	System	77215	62077	80%	-28.09***
	Non-System	44930	38953	87%	
2007	System	81064	61239	76%	-54.92***
	Non-System	46237	40829	88%	
2008	System	84344	65872	78%	-5.56***
	Non-System	48045	38149	79%	
2009	System	91961	70293	76%	-10.18***
	Non-System	42816	33797	79%	
2010	System	100907	76614	76%	-0.89
	Non-System	44690	34028	76%	

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

5.1.4.5 Top 10% Applicant Rates

When considering top 10% applicant rates, the three groups have some notable similarities and differences. In comparing the groups, the system group had 54% to 71% lower rates than the research group; the non-system group had 50% to 70% lower applicant rates than the research group; and the system group had 17% lower rates and up to 17% higher rates than the non-system group. All three groups were found to have increases in their applicant rates, which indicated the groups were becoming more attractive to the most prepared high school students. The system group's applicant rate increased by an average of 1.36% per year, the non-system group's rates increased by an average of .55% per year, and the research group's rates increased by an average of 1.69% per year. The system group had top 10% applicant rates that ranged from 10% to 13% as did the non-system group although there were differences in the years during which each had these rates. The research group had the highest top 10% applicant rates that ranged from 26% to 37%. Two-tailed z-tests were conducted to compare the applicant rates of the system and research groups; the non-system and research groups; and the system and non-system groups. A z-test was run for each of the 13 years for which data was available to determine if there were statistically significant differences between the top 10% applicant rates among the three groups.

The results of the z-tests indicated that there were more differences than similarities between the groups. Specifically, the z-tests revealed that there were statistically significant differences in the acceptance rates of the system and research groups as well as the non-system and research groups (all tests at $p < .001$). There were statistically significant differences in acceptance rates between the system and non-system groups for all but two of the years analyzed (2004 and 2008) (four statistically significant tests at $p < .01$; seven statistically significant tests at $p < .001$). Based on these findings, it is concluded that neither the system nor the non-system group has become like the research group in terms of level of appeal to the most prepared high school graduates. Further, for most of study time period for which data was available, the system and non-system groups had differential appeal to the most prepared high school graduates. Unlike the with the acceptance rates, there is not a discernible pattern of which group had the most appeal.

The system and non-system groups are clearly distinct from the research group. Neither became like the research group in a statistically discernible way. Further, for the most part, the system and non-system groups are not like one another either. Although there are a couple of years where there was no statistically significant difference in their top 10% applicant rates, those instances appear random among all the tests as they are not sequential and institutions of differences followed and proceeded them. The rates between the groups, even when there is a statistically significant difference, are quite similar to one another as the range of applicant rates demonstrates. The only notable point that emerges when examining the distribution of top 10% applicant rates among the system and non-system group is that the systems rates were typically higher than the non-system group in the first half of the study period and then appear to have shifted to be lower than the non-system group in the second half of the study. If this is indeed the case and not just random occurrences, then it would suggest that being a member in a multi-campus system might have an effect on the institutions appeal to the most prepared high school students. This, however, is highly speculative and what can be said for certain based on the data is that the multi-campus system's role in the homogenization of top 10% applicant rates is unclear. Tables 5.67, 5.68, and 5.69 contain the number of total applicants, the number of top 10% applicants, and rates of top 10% applicants for each of the three comparisons as well as the z statistic. Table 5.67 contains this information for the comparison of the system and research groups; Table 5.68 for the non-system and research groups; and Table 5.69 for the system and non-system groups.

Table 5.67 Two-tailed Z-test Results from Comparison of Top 10% Applicant Rates for System and Research Groups

Year	Group	Total Applications	Number Accepted	Proportion Accepted	z statistic
1998	System	39620	3991	10%	-58.20***
	Research	27410	7482	27%	
1999	System	37315	4599	12%	-48.22***
	Research	29679	8009	27%	
2000	System	44807	5248	12%	-51.63***
	Research	34129	8846	26%	
2001	System	51792	6411	12%	-80.49***
	Research	32797	11701	36%	
2002	System	57748	6364	11%	-86.04***
	Research	36456	12397	34%	
2003	System	64087	7171	11%	-91.35***
	Research	38228	13307	35%	
2004	System	70216	7944	11%	-95.62***
	Research	36818	13182	36%	
2005	System	70312	7457	11%	-101.01***
	Research	38438	13852	36%	
2006	System	77215	9533	12%	-96.52***
	Research	40937	14827	36%	
2007	System	81064	8801	11%	-107.12***
	Research	42494	15440	36%	
2008	System	84344	10374	12%	-99.97***
	Research	46396	16548	36%	
2009	System	91961	11106	12%	-107.64***
	Research	50980	18424	36%	
2010	System	100907	13071	13%	-108.87***
	Research	51748	19131	37%	

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

Table 5.68 Two-tailed Z-test Results from Comparison of Top 10% Applicant Rates for Non-system and Research Groups

Year	Group	Total Applications	Number Accepted	Proportion Accepted	z statistic
1998	Non-System	25827	3124	12%	-43.89***
	Research	27410	7482	27%	
1999	Non-System	28211	3208	11%	-47.51***
	Research	29679	8009	27%	
2000	Non-System	35015	3838	11%	-50.81***
	Research	34129	8846	26%	
2001	Non-System	39143	4158	11%	-80.74***
	Research	32797	11701	36%	
2002	Non-System	39893	4053	10%	-80.05***
	Research	36456	12397	34%	
2003	Non-System	41254	4348	11%	-82.24***
	Research	38228	13307	35%	
2004	Non-System	42426	4643	11%	-83.59***
	Research	36818	13182	36%	
2005	Non-System	43430	4832	11%	-84.76***
	Research	38438	13852	36%	
2006	Non-System	44930	5305	12%	-84.33***
	Research	40937	14827	36%	
2007	Non-System	46237	5275	11%	-87.68***
	Research	42494	15440	36%	
2008	Non-System	48045	5958	12%	-83.90***
	Research	46396	16548	36%	
2009	Non-System	42816	5663	13%	-80.01***
	Research	50980	18424	36%	
2010	Non-System	44690	6025	13%	-82.83***
	Research	51748	19131	37%	

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

Table 5.69 Two-tailed Z-test Results from Comparison of Top 10% Applicant Rates for System and Non-system Groups

Year	Group	Total Applications	Number Accepted	Proportion Accepted	z statistic
1998	System	39620	3991	10%	-8.13***
	Non-System	25827	3124	12%	
1999	System	37315	4599	12%	3.73***
	Non-System	28211	3208	11%	
2000	System	44807	5248	12%	3.32***
	Non-System	35015	3838	11%	
2001	System	51792	6411	12%	8.18***
	Non-System	39143	4158	11%	
2002	System	57748	6364	11%	4.28***
	Non-System	39893	4053	10%	
2003	System	64087	7171	11%	3.30***
	Non-System	41254	4348	11%	
2004	System	70216	7944	11%	1.91
	Non-System	42426	4643	11%	
2005	System	70312	7457	11%	-2.75**
	Non-System	43430	4832	11%	
2006	System	77215	9533	12%	2.78**
	Non-System	44930	5305	12%	
2007	System	81064	8801	11%	-3.02**
	Non-System	46237	5275	11%	
2008	System	84344	10374	12%	-0.54
	Non-System	48045	5958	12%	
2009	System	91961	11106	12%	-5.95***
	Non-System	42816	5663	13%	
2010	System	100907	13071	13%	-2.75**
	Non-System	44690	6025	13%	

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

5.1.4.6 Summary of Findings for Hypothesis 3

The system group is not becoming like the research group for any of the aspects of the analysis for Hypothesis 3. The system group is like the research group with regard to doctoral level program duplications and master's level program proportions. These two instances, however, are not cases where the system group became like the research group, but rather where the system group was already like the research group and maintained likeness throughout the course of the study. The findings from Hypothesis 1 indicates that mimetic isomorphic forces might be at work on program duplications, graduate level program proportions, research expenditures, acceptances rates, and top 10% applicant rates, but it is likely the changes that occurred were too small to make any discernible impact that would have allowed the system group to become like the research group. Thus, the comparisons of the system group to the research group provide little insight into the role multi-campus system membership might have on homogenization.

The comparison of the system and non-system groups provide little more insight into the multi-campus system's role in controlling for homogenization, and the insight it does provide rests on the assumption that mimetic isomorphic forces may be at work. Multi-campus system membership does not appear to have an impact on mitigating programmatic homogenization as the system group had statistically significant program duplication rates that were higher than the non-system group's at the bachelor and master's level for most of the study. Even when the statistical difference disappeared in the final year of the analysis, it was because the non-system group had increased program duplication rates, not because the program duplication rates of the system group were lowered.

For graduate level program proportions, the findings indicate that multi-campus system membership had no effect during the course of this study on the level of homogenization for master's level program proportions. At the doctoral level, however, the multi-campus system's role in discouraging or preventing homogenization is unclear. The system group had the lowest levels of doctoral proportions, which suggests that the group is not mimicking the research group (or at least not at the same level as the non-system group), but it also had the highest average annual percent increase in doctoral proportions, while the non-system and research groups had average decreases in doctoral program proportions.

Similar uncertainty as to the role of the multi-campus system was also found for research expenditures and first-time, freshmen acceptance rates. Even if mimetic isomorphic change was assumed to be occurring, there were no statistically discernible differences between the research expenditures of the system and non-system groups. However, the system group had higher average expenditures for almost all of the years that were examined suggesting that on a practical level, multi-campus system membership did not have an impact on controlling for research expenditure homogenization. For acceptance rates, there was also no difference between the system and non-system groups in terms of their course of selectivity. Neither group became like the research group, but both groups became more like one another and on a course of increasing selectivity. The multi-campus system does not seem to have had an impact on maintaining the level of selectivity for the system group.

The implications for multi-campus system membership effect on top 10% applicant rates are even murkier than what is seen for the other variables. For the most part, the system and non-system groups are not like one another and the two instances in which there is no statistically significant differences between their applicant rates appears random among all the tests because the instances are not sequential. The only notable point that emerged when examining the distribution of duplication rates among the system and non-system groups is the systems rates shifted lower than the non-system group in the second half of the study. This could suggest that being a member in a multi-campus system has the effect of decreasing appeal to the most prepared high school students, but this is highly speculative.

Evidence to support that the multi-campus systems are actively preventing or controlling homogenization among constituent institutions to any greater extent than what is seem among non-system institutions is very weak at best and highly speculative. Further, the weak evidence assumes that homogenization due to mimetic isomorphic forces is occurring, which in some cases is called into question by the findings of Hypothesis 1. In sum, the findings from Hypothesis 3 do not support that membership within a multi-campus system has a differential impact on controlling for the effects of mimetic isomorphic induced homogenization.

5.1.5 Regional Comparisons and Competition

To explore the effects of competition, the variables were examined using comparisons of universities within close geographic proximity. The comparisons followed the same methodological format as that of Hypothesis 1. Two regions were analyzed, the DFW region and the Austin-SA region. The DFW region included TWU, UNT, UTA and UTD. The Austin-SA region included UTSA and TX State. A full description of how the regions were identified can be found in Chapter 4. The presentation of results for this section follows the same order as the variables are listed in for each of the Hypotheses.

5.1.5.1 Program Duplications

5.1.5.1.1 All Degree levels combined

Examination of all program levels combined for each institution revealed that 100% of the institutions within both regions had an average annual percent increase in program duplication rates. For the DFW region, the percent change in duplication rates resulted from three different patterns of programming. UTD had an average annual percent increase in total program number and increase in duplicated program number. UTA had an average annual percent decrease in total program number and increase in duplicated program number. TWU and UNT had an average annual percent decrease in total program number and decrease in duplicated program number. For the Austin-SA region, UTSA and TX State both had an average annual percent increase in program number as well as the number of duplicated programs. Table 5.70 contains total program number, total program duplications and duplication rates for each institution. Table 5.71 contains the average annual percent change for total program number, total program duplications and duplication rates for each institution. Both tables are organized by region.

Another aspect of determining whether the universities in each region are becoming more like one another is to consider the direction of program duplication movement through examination of duplication rate levels. Duplication rate levels for the DFW region universities differ some, but TWU, UNT and UTD have considerable overlap. TWU's duplication rates ranged from 43% to 63% over time. UNT's duplication rates ranged from 47% to 65% over the study period and UTD's rates ranged from 40% to 56%. UTA's duplication rates were the highest in the region as they ranged from 64% to 76% over the study period. Duplication rate ranges for the Austin-SA region differ as well. UTSA's duplication rates ranged from 62% to 71% over the study period, while TX State's rates ranged from 57% to 63%. Although there was variability in the duplication rate ranges within the two regions, the salient point with regard to regional competition is that none of the universities in either group have become more unique in their programming as duplication rates increased for all universities.

Table 5.70 Program Number, Duplicated Programs and Program Duplication Rates of All Degree Levels Combine for the DFW and Austin-SA Regions

	Number of Programs (Number of Duplicated Programs) (Duplication Rate)				
Institution	1990	1995	2000	2005	2010
DFW Region					
TWU	314 (139) (44%)	269 (117) (43%)	226 (115) (51%)	159 (87) (55%)	153 (97) (63%)
UNT	480 (225) (47%)	371 (183) (49%)	371 (195) (53%)	375 (189) (50%)	277 (180) (65%)
UTA	217 (138) (64%)	218 (157) (72%)	237 (161) (68%)	197 (143) (73%)	196 (149) (76%)
UTD	115 (48) (42%)	116 (52) (45%)	129 (51) (40%)	122 (64) (52%)	144 (81) (56%)
Austin-SA Region					
UTSA	120 (74) (62%)	129 (91) (71%)	140 (100) (71%)	158 (110) (70%)	171 (121) (71%)
TX State	206 (118) (57%)	185 (114) (62%)	195 (122) (63%)	204 (124) (61%)	211 (130) (62%)

Table 5.71 Average Annual Percent Change in Program Number, Program Duplications and Duplication Rates for All Degree Levels Combined for the DFW and Austin-SA Regions

	Annual Average Percent Change		
Institution	Program Number	Program Duplications	Duplication Rate
DFW Region			
TWU	-2.56%	-1.51%	2.16%
UNT	-2.11%	-1.00%	1.93%
UTA	-0.48%	0.40%	0.98%
UTD	1.26%	3.44%	1.74%
Austin-SA Region			
UTSA	2.13%	3.18%	0.74%
TX State	0.12%	0.51%	0.38%

The inferential data confirms this as well. Simple OLS analysis was used to determine if the individual universities' program duplication rates were significantly increasing or decreasing over time. Each university in both regional groups was found to have program duplication rates that were increasing over time. Within the DFW region, TWU had a statistically significant rate of increase ($p < .05$). The rates of increase were also quite similar within each regional group. For the DFW region, TWU's duplication rate increased by .010% per year; UNT and UTD's duplication rates increased by .007% per year; and UTA's rate increased by .005% per year. For the Austin-SA region, UTSA's duplication rate increased by .003% per year, while TX State's increased by .002% per year. Table 5.725 shows the results of simple OLS analysis of each institution's duplication rates and the table is organized by region.

Table 5.72 Simple OLS Analysis of Duplication Rates for All Program Levels for the DFW and Austin-SA Regions

Institution	Constant	Coefficient (t statistic)	Adjusted R^2	F	Significance of Model
DFW Region					
TWU	-19.282	.010* (5.561)	0.882	30.925	0.011
UNT	-14.38	.007 (2.585)	0.587	6.684	0.081
UTA	-9.468	.005 (2.690)	0.609	7.237	0.074
UTD	-14.19	.007 (2.413)	0.547	5.821	0.095
Austin-SA Region					
UTSA	-6.216	.003 (1.587)	0.275	2.517	0.211
TX State	-2.52	.002 (1.310)	0.152	1.715	0.282

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

5.1.5.1.2 Bachelor level programs

Examination of bachelor level programs for each institution revealed that three quarters of the universities in the DFW region and half of the universities in the Austin-

SA region average annual percent increases in program duplication rates. For the DFW region, the percent change in duplication rates resulted from two different patterns of programming. TWU, UNT and UTA had average annual percent decreases in total program number and decreases in duplicated program number, which resulted in average annual percent increases in duplication rates for each university. UTD, on the other hand, had an increase in total program number and increase in duplicated program number that resulted in a 0% average annual change. For the Austin-SA region, UTSA had an average annual percent decrease in program number, but an increase in duplicated programs. This resulted in UTSA having an average annual percent decrease in program duplication rate, while TX State had an increase. Table 5.73 contains bachelor program number, bachelor program duplications and duplication rates for each institution. Table 5.74 contains the average annual percent change for total program number, total program duplications and duplication rates for each institution. Both tables are organized by region.

Table 5.73 Program Number, Duplicated Programs and Program Duplication Rates of Bachelor Level Programs for DFW and Austin-SA Regions

	Number of Programs (Number of Duplicated Programs) (Duplication Rate)				
Institution	1990	1995	2000	2005	2010
DFW Region					
TWU	138 (70) (51%)	115 (60) (52%)	104 (50) (48%)	67 (41) (61%)	68 (48) (71%)
UNT	150 (93) (62%)	111 (71) (64%)	117 (72) (62%)	121 (73) (60%)	104 (70) (67%)
UTA	107 (76) (71%)	105 (86) (82%)	113 (84) (74%)	77 (65) (84%)	80 (64) (80%)
UTD	41 (26) (63%)	40 (27) (68%)	43 (26) (60%)	42 (28) (67%)	52 (33) (63%)
Austin-SA Region					
UTSA	57 (47) (82%)	69 (56) (81%)	71 (60) (85%)	70 (54) (77%)	78 (61) (78%)
TX State	143 (79) (55%)	112 (78) (70%)	110 (74) (67%)	110 (75) (68%)	109 (81) (74%)

Table 5.74 Average Annual Percent Change in Program Number, Program Duplications and Duplication Rates for Bachelor Level Programs for the DFW and Austin-SA Regions

	Annual Average Percent Change		
Institution	Program Number	Program Duplications	Duplication Rate
DFW Region			
TWU	-2.54%	-1.57%	1.96%
UNT	-1.53%	-1.24%	0.43%
UTA	-1.26%	-0.79%	0.63%
UTD	1.34%	1.35%	0.00%
Austin-SA Region			
UTSA	1.84%	1.49%	-0.26%
TX State	-1.19%	0.13%	1.73%

Another aspect of determining whether the universities in each region are becoming more like one another is to consider the direction of program duplication movement through examination of duplication rate levels. Bachelor duplication rate levels for the DFW region universities differ somewhat with TWU have the greatest range of variability with duplication rates that ranged from 48% to 71% over time. UNT and UTD had considerable overlap in duplication rate ranges. UNT’s rates ranged from 62% to 67% over the study period and UTD’s rates ranged from 63% to 68%. UTA’s duplication rates ranged, over the study period, from 71% to 84%. Duplication rate ranges for the Austin-SA region differed as well. UTSA’s duplication rates ranged from 77% to 85% over the study period, while TX State’s rates ranged from 55% to 74%. None of the universities in either group had a clear trend of increasing (or decreasing) program duplication rates at the bachelor level. The rates in 2010 were, for each university, higher than the rates in 1990, but there were years in between that were higher than those seen in 2010. Even with the variability in program duplication rates among the universities, UTSA and TX State duplication rates have been moving closer to one another over the course of the study period, UTSA's rates were generally becoming lower, while TX State's rates were generally increasing. UNT and UTD's duplication rates remained relatively close throughout the study period and TWU's duplication rates aligned with UNT and UTD in the latter part of the study period. UTA's rates were consistently higher than those of TWU, UNT and UTD. None of the institutions' program duplication rates became notable lower than the other institutions within their respective regions suggesting that none of the institutions were offering substantially more unique programming that the other institutions within the region.

The inferential data confirms the descriptive findings. Simple OLS analysis was used to determine if the individual universities' program duplication rates were significantly increasing or decreasing over time. Within the DFW region, UNT and UTD were found to have program duplication rates that were not correlated with time as evidenced by their negative adjusted R^2 scores. TWU and UTA's program duplication rates were found to be increasing over time, but the increases were not statistically significant. Within the Austin-SA region, UTSA was found to have program duplication rates that decreased over time, while TX State's rates increased over time. Neither university's change in duplication rates was statistically significant. None of the universities in the DFW region had bachelor level programming that became more unique. For the Austin-SA region, UTSA's programming did become more unique, but as the descriptive data indicates, the program duplication rates are still higher than those of TX State, so UTSA has not distinguished itself in terms of bachelor level programming. Table 5.75 shows the results of simple OLS analysis of each institution's duplication rates and the table is organized by region.

Table 5.75 Simple OLS Analysis Results for Bachelor Level Duplication Rates for the DFW and Austin-SA Regions

Institution	Constant	Coefficient (t statistic)	Adjusted R^2	F	Significance of Model
		DFW Region			
TWU	-18.938	.010 (2.596)	0.589	6.741	0.081
UNT	-2.166	.001 (.768)	-0.114	0.589	0.499
UTA	-7.401	.004 (1.253)	0.125	1.57	0.299
UTD	0.935	-.0001 (-.071)	-0.331	0.005	0.948
		Austin-SA Region			
UTSA	5.815	-.003 (-1.496)	0.236	2.237	0.232
TX State	-14.003	.007 (2.480)	0.563	6.153	0.089

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

5.1.5.1.3 Master's level programs

Examination of master's level programs for each institution revealed that all of the universities in the DFW region and half of the universities in the Austin-SA region had average annual percent increases in program duplication rates. For the DFW region, the percent change in duplication rates resulted from two different patterns of programming. TWU and UNT had average annual percent decreases in total program number and decreases in duplicated program number, while UTA and UTD had increases in total program number and increases in duplicated program number. For the Austin-SA region, both UTSA and TX State had average annual percent increases in program number and in duplicated programs, but UTSA had an average annual percent increase in program duplication rate, while TX State had a decrease in program duplication rate. Table 5.76 contains master's program number, master's program duplications and duplication rates for each institution. Table 5.77 contains the average annual percent change for master's program number, master's program duplications and duplication rates for each institution. Both tables are organized by region.

Table 5.76 Program Number, Duplicated Programs and Program Duplication Rates of Master's Level Programs for the DFW and Austin-SA Regions

	Number of Programs (Number of Duplicated Programs) (Duplication Rate)				
Institution	1990	1995	2000	2005	2010
DFW Region					
TWU	122 (51) (42%)	114 (46) (40%)	96 (50) (52%)	69 (34) (49%)	62 (37) (60%)
UNT	212 (90) (42%)	174 (79) (45%)	178 (89) (50%)	180 (79) (44%)	120 (75) (63%)
UTA	79 (43) (54%)	80 (52) (65%)	87 (56) (64%)	82 (55) (67%)	84 (61) (73%)
UTD	44 (15) (34%)	45 (17) (38%)	54 (18) (33%)	50 (24) (48%)	61 (32) (52%)
Austin-SA Region					
UTSA	63 (27) (43%)	58 (34) (59%)	65 (38) (58%)	69 (43) (62%)	71 (46) (65%)
TX State	63 (39) (62%)	73 (36) (49%)	83 (48) (58%)	88 (49) (56%)	92 (48) (52%)

Table 5.77 All Average Annual Percent Change in Program Number, Program Duplications and Duplication Rates of Master's Level Programs for the DFW and Austin-SA Regions

	Annual Average Percent Change		
Institution	Program Number	Program Duplications	Duplication Rate
DFW Region			
TWU	-2.46%	-1.37%	2.14%
UNT	-2.17%	-0.83%	2.36%
UTA	0.32%	2.09%	1.67%
UTD	1.93%	5.67%	2.69%
Austin-SA Region			
UTSA	0.63%	3.52%	2.56%
TX State	2.30%	1.15%	-0.79%

Another aspect of determining whether the universities in each region are becoming more like one another is to consider the direction of program duplication movement through examination of duplication rate levels. Duplication rate levels for the universities in the DFW region differed in their range of variability. There was considerable overlap in the duplication rate levels between TWU and UNT and to a lesser extent with UTD. TWU's duplication rates ranged from 40% to 60% over time and UNT's duplication rates ranged from 42% to 63% over time. UTD's duplication rates were somewhat lower and ranged over time from 33% to 52%. UTA's duplication rates were the highest in the region and ranged over time from 54% to 73%. Duplication rate ranges for the Austin-SA region differ minimally between universities. UTSA's duplication rates ranged over time from 43% to 65%, while TX State's rates ranged from 49% to 58% over time. The universities in the DFW region had a general trend of increasing program duplication rates at the master's program level. For the universities in the Austin-SA region, UTSA's program duplication rates generally increased over time, but TX State's rates varied over time. None of the universities in the DFW region distinguished themselves among the other universities within the region in terms increasingly more unique master's level programming. For the Austin-SA region, TX State seems to have increased their unique master's level programming when looking at the differences in program duplications between 1990 and 2010, but there are observations between these two points where program duplication rates were higher than those seen in 2010, suggesting that TX State does not have a clear trend of increasingly unique programming.

The inferential data confirms the findings of the descriptive analysis. Simple OLS analysis was used to determine if the individual universities' program duplication rates were significantly increasing or decreasing over time. Within the DFW region, all the universities were found to have program duplication rates that increased over time and the duplication rate increases for TWU and UTA were statistically significant (both at $p < .05$). Although TWU and UTA had rates that increased significantly over time, the rates of change for both were consistent within those for UNT and UTD, which indicates that TWU and UTA were not increasing program duplication rates to any greater degree than UNT or UTD. These results do indicate that none of the universities in the DFW region became more unique in terms of master's level programming. Within the Austin-SA region, TX State was found to have master's level program duplication rates that were not correlated with time, while UTSA's duplication rates were increasing over time. Neither university had master's level programming that became increasing more unique over time. Table 5.78 shows the results of simple OLS analysis of each institution's duplication rates and the table is organized by region.

Table 5.78 Simple OLS Analysis Results for Master's Level Duplication Rates for the DFW and Austin-SA Regions

Institution	Constant	Coefficient (t statistic)	Adjusted R^2	F	Significance of Model
DFW Region					
TWU	-19.327	.010* (4.625)	0.836	21.394	0.019
UNT	-18.601	.010 (3.137)	0.689	9.841	0.052
UTA	-15.752	.008* (4.319)	0.815	18.656	0.023
UTD	-18.192	.009 (2.357)	0.532	5.554	0.1
Austin-SA Region					
UTSA	-19.002	.010 (2.844)	0.639	8.085	0.065
TX State	6.537	-0.003 (-0.889)	-0.055	0.79	0.44

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

5.1.5.1.4 Doctoral level programs

Examination of doctoral level programs for each institution revealed that all of the universities in the DFW and Austin-SA regions had average annual percent increases in program duplication rates. For the DFW region, the percent change in duplication rates resulted from two different patterns of programming. TWU and UNT had average annual percent decreases in total program number and decreases in duplicated program number, while UTA and UTD had increases in total program number and in duplicated program number. For the Austin-SA region, both UTSA and TX State had average annual percent increases in program number and in duplicated programs. Table 5.79 contains doctoral program number, doctoral program duplications and duplication rates for each institution. Table 5.80 contains the average annual percent change for doctoral program number, doctoral program duplications and duplication rates for each institution. Both tables are organized by region.

Table 5.79 Program Number, Duplicated Programs and Program Duplication Rates of Doctoral Level Programs for the DFW and Austin-SA Regions

	Number of Programs (Number of Duplicated Programs) (Duplication Rate)				
Institution	1990	1995	2000	2005	2010
TWU	54 (18) (33%)	40 (11) (28%)	26 (15) (58%)	23 (12) (52%)	23 (12) (52%)
UNT	118 (42) (36%)	86 (33) (38%)	76 (34) (45%)	74 (37) (50%)	53 (35) (66%)
UTA	31 (19) (61%)	33 (19) (58%)	37 (21) (57%)	38 (23) (61%)	32 (24) (75%)
UTD	30 (7) (23%)	31 (8) (26%)	32 (7) (22%)	30 (12) (40%)	31 (16) (52%)
Austin-SA Region					
UTSA		2 (1) (50%)	4 (2) (50%)	19 (13) (68%)	22 (14) (64%)
TX State			2 (0) (0%)	6 (0) (0%)	10 (1) (10%)

Note: Blank space indicates no doctoral programs offered during the specified interval

Table 5.80 Changes in Program Number, Program Duplications, and Duplication Rates of Doctoral Programs for the DFW and Austin-SA Regions

	Annual Average Percent Change		
Institution	Program Number	Program Duplications	Duplication Rate
DFW Region			
TWU	-2.87%	-1.67%	2.83%
UNT	-2.75%	-0.83%	4.28%
UTA	0.16%	1.32%	1.12%
UTD	0.17%	6.43%	6.06%
Austin-SA Region			
UTSA[1]	66.67%	86.67%	1.82%
TX State[2]	40.00%	100.00%	1.00%

Table 5.80 – Continued

[1] Four observations only since 1995

[2] Three observations only since 2000

Another aspect of determining whether the universities in each region were becoming more like one another is to consider the direction of program duplication movement through examination of duplication rate levels. Duplication rate levels for the DFW region universities differ considerably at the doctoral level. There was considerable overlap in the duplication rates ranges of TWU and UTD. TWU's duplication rates ranged from 28% to 58% over time, while UTD's rates ranging over time from 22% to 52%. UNT''s program duplication rates ranged over time from 36% to 66%. UTA had the highest duplication rates that ranged over time from 58% to 75%. Duplication rate ranges for the Austin-SA region also differed considerably between universities. UTSA's duplication rates ranged over time from 50% to 68%, while TX State's rates ranged from 0% to 10% over time. The doctoral program duplication rates for the universities in the DFW region generally increased consistently over time as did the duplication rates of the universities within the Austin-SA region. Although, TX State's program duplication rates are notably low. TX State's duplication rates are also low in comparison to other universities outside the Austin-SA region that have a small number of doctoral programs; however, the most salient point when comparing TX State regionally is that the doctoral program duplication rate was increasing over time, which indicates that the doctoral program offerings at TX State were not becoming more unique.

The inferential data confirms the findings of the descriptive findings. Simple OLS analysis was used to determine if the individual universities' program duplication rates were significantly increasing or decreasing over time. Within the DFW and the Austin-SA regions, all the universities were found to have program duplication rates that increased over time. The duplication rate increases for UNT were statistically significant. These results indicate that none of the universities in either the DFW or Austin-SA regions were becoming more unique in terms of doctoral level programming. Table 5.81 shows the results of simple OLS analysis of each institution's duplication rates and the table is organized by region.

Table 5.81 Simple OLS Analysis Results for Doctoral Level Duplication Rates for the DFW and Austin-SA Regions

Institution	Constant	Coefficient (t statistic)	Adjusted R^2	F	Significance of Model
		DFW Region			
TWU	-24.494	.012 (1.919)	0.402	3.683	0.151
UNT	-28.543	.015* (5.346)	0.873	28.58	0.013
UTA	-11.526	.006 (1.481)	0.23	2.193	0.235
UTD	-27.975	.014 (3.040)	0.673	9.24	0.056
		Austin-SA Region			
UTSA[1]	-23.186	.012 (1.953)	0.484	3.814	0.190
TX State[2]	-20.017	.010 (1.732)	0.5	3	0.333

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

[1] Analysis based on four observations

[2] Analysis based on 3 observations

5.1.5.1.5 Summary of program duplication analyses

The descriptive and inferential analyses of the program duplications for all degree levels combined indicated the all of the universities in both the DFW and Austin-SA regions were becoming more homogeneous in their programming. Program duplications were found to be increasing over time for each university and thus, none of the universities was becoming more distinct from the others by offering increasing levels of unique programming. These findings are an accurate representation of the findings with the degree levels. The universities' degree level specific duplication rates in almost all cases were either increasing over time or change in the respective duplication rate was not correlated with time. In cases where duplication rates changes were not correlated with the time, there was neither an aggregate increase nor decrease in program duplication rates and those universities programming was not becoming more unique. The only exception to this is the case of UTSA where bachelor level program duplications were decreasing overtime; however, even with the decreases over time, their duplication rates are still far higher than those of TX State, the other university in the region. So, although UTSA has decreased bachelor level program duplications, the university is still not distinct from TX State.

If competition was driving change in program duplications, then it is expected the universities in closest proximity would be direct competitors and these universities would be expected to distinguish themselves form one another by developing unique programming. This is clearly not the case in either region. Programming at all degree levels is becoming less unique and more homogenized. Mimetic isomorphic change is a more reasonable explanation for the homogenization of programming and reduction of institutional diversity among the universities within the DFW and Austin-SA regions.

5.1.5.2 Proportion of Graduate Level Programs

5.1.5.2.1 Master's programs

Examination of each institution's master's level programs revealed that three quarters of the universities in the DFW region and half of the universities in the Austin-SA region had an average annual percent increase in the proportion of master's programs out of total number of programs. The average annual percent changes in program proportions in the DFW region resulted from three different patterns of programming. UTD had an average annual percent increase in total program number and master's program numbers, which resulted in an average annual percent increase in their master's program proportions. UTA had an average annual percent decrease in total program number and increase in master's program number, which resulted in an average annual percent increase in their master's program proportions. TWU and UNT had average annual percent decreases in total program number and master's program number, which, in both cases, resulted in an average annual percent decreases in their master's program proportions. The average annual percent increases found in program proportions in the Austin-SA region resulted from increases in total program number and master's program numbers. Table 5.82 shows the proportion of master's level programs for each institution as well as the average annual percent changes in total program number, master's programs and master's program proportions. The table is organized by region.

Table 5.82 Proportions of Master's Programs for the DFW and Austin-SA Regions

Institution	Proportion of Master's Level Programs					Average Annual Percent Change		
	1990	1995	2000	2005	2010	All Programs	Master’s Programs	Master’s Proportion
DFW Region								
TWU	39%	42%	42%	43%	41%	-2.56%	-2.46%	0.21%
UNT	44%	47%	48%	48%	43%	-2.11%	-2.17%	-0.10%
UTA	36%	37%	37%	42%	43%	-0.48%	0.32%	0.89%
UTD	38%	39%	42%	41%	42%	1.26%	1.93%	0.54%
Austin-SA Region								
UTSA	53%	45%	46%	44%	42%	2.13%	0.63%	-1.05%
TX State	31%	39%	43%	43%	44%	0.12%	2.30%	2.13%

Note: Total program numbers and master’s program numbers can be found in Tables 5.9 and 5.15 respectively.

Although there was some distinction in the programming patterns of the universities within the DFW region, the proportion levels and ranges were much less distinct among universities. TWU’s master’s program proportions ranged over time from 39% to 42%. UNT’s master’s program proportions ranged over time from 43% to 48%, master’s proportions for UTA ranged over time from 37% to 43%. UTD’s master’s program proportions ranged over time from 38% to 42%. For the Austin-SA region, UTSA had master’s level program proportions that ranged over time from 42% to 53% and TX State had proportions that ranged over time from 31% to 44%. UTSA’s master’s program proportions generally decreased over time while TX State’s proportions increased over time, bringing both universities relatively close in proportions to one another by the end of the study period.

Simple OLS analysis was used to determine if changes in the proportion of the master’s programs were correlated with time and if those correlations were statistically significant. For the DFW region, analysis revealed that master’s level program proportions for TWU and UNT were not correlated with time as indicated by their respective negative adjusted R^2 scores. UTA and UTD, however, were found to have master's proportions that were increasing over time and the increase for UTA was statistically significant ($p < .05$). Based on the descriptive and inferential findings, none of the universities in the DFW region distinguished themselves among the other universities in the region in terms of master's level program proportions.

For the Austin-SA region, UTSA was found to have master's level program proportions that decreased over time and the decrease was statistically significant ($p < .05$). TX State was found to have master's proportions that increased over time. While it may seem that UTSA and TX State were diverging in terms of master's level program proportions, the findings from the descriptive analysis put these results in perspective; specifically the decrease in master's program proportions for UTSA and the increase in master's proportions for TX State brought the two institutions to a state of likeness. Table 5.83 contains the details of the OLS analysis of master's level program proportions.

Table 5.83 Simple OLS Analysis Results for Master's Proportions for the DFW and Austin-SA Regions

Institution	Constant	Coefficient (t statistic)	Adjusted R^2	F	Significance of Model
DFW Region					
TWU	-1.329	.001 (.707)	-0.143	0.499	0.531
UNT	0.701	.0001 (-.075)	-0.331	0.006	0.945
UTA	-6.739	.004* (3.649)	0.755	13.318	0.036
UTD	-3.751	.002* (3.480)	0.735	12.113	0.04
Austin-SA Region					
UTSA	9.785	-.005* (-3.311)	0.714	10.965	0.045
TX State	11.489	.006 (2.973)	.662	8.837	0.059

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

5.1.5.2.2 Doctoral programs

Examination of each institution's doctoral level programs revealed that three quarters of the universities in the DFW region had an average annual percent decrease in doctoral level program proportions out of total programs. Both of the universities in the Austin-SA region had an average annual percent increase in their proportion of doctoral programs out of total number of programs. The average annual percent changes in program proportions in the DFW region resulted from one of three different patterns of programming. UTD had an average annual percent increase in total program number and doctoral program numbers, which resulted in an average annual percent decrease in their doctoral program proportions. UTA had an average annual percent decrease in total program number and increase in doctoral program number, which resulted in an average annual percent increase in their doctoral program proportions. TWU and UNT had average annual percent decreases in total program number and doctoral program number, which, in both cases, resulted in an average annual percent decrease in their doctoral program proportions. The average annual percent increases found in doctoral level program proportions for both universities in the Austin-SA region resulted from increases in total program number and doctoral program numbers. Table 5.84 shows the proportion of doctoral level programs for each institution as well as the average annual percent changes in total program number, doctoral programs and doctoral program proportions. The table is organized by region.

Table 5.84 Proportions of Doctoral Programs for the DFW and Austin-SA Regions

Institution	Proportion of Doctoral Programs 1990	1995	2000	2005	2010	Average Annual Percent Change All Programs	Doctoral Programs	Doctoral Proportion
DFW Region								
TWU	17%	15%	12%	14%	15%	-2.56%	-2.87%	-0.63%
UNT	25%	23%	20%	20%	19%	-2.11%	-2.75%	-1.11%
UTA	14%	15%	16%	19%	16%	-0.48%	0.16%	0.71%
UTD	26%	27%	25%	25%	22%	1.26%	0.17%	-0.87%
DFW Region								
UTSA		2%	3%	12%	13%	2.17%	66.67%	48.65%
TX State			1%	3%	5%	0.82%	40.00%	36.21%

Note 1: Blank space indicates doctoral programs not offered.
Note 2: Total program numbers and doctoral program numbers can be found in Tables 5.9 and 5.18, respectively.

Although there were differences in the programming patterns of the universities within the DFW region, the proportion levels and ranges were similar among them, though not as similar as was the case for doctoral level proportions. TWU's doctoral program proportions ranged from 12% to 17% over time. UNT's doctoral program proportions ranged over time from 19% to 25%, UTA's doctoral proportions ranged over time from 14% to 19%. UTD's doctoral program proportions ranged over time from 22% to 27%. Generally speaking, TWU, UNT and UTD's doctoral program proportions decreased over time, while UTA's increased over time, but TWU and UTA lagged the other two universities in their proportion of doctoral programs. The universities in the Austin-SA region did not get into the business of offering doctoral programs until after 1990. TX State lagged behind UTSA in the proportion of doctoral programs, but UTSA has offered doctoral programs for at least five years longer than TX State. UTSA's doctoral proportions ranged from 2% to 13%, while TX State's proportions ranged from

1% to 5%. However, both universities doctoral proportions steadily increased over the time period for which they offered doctoral programs.

Simple OLS analysis was used to determine if changes in doctoral program proportions were correlated with time and if those correlations were statistically significant. For the DFW region, analysis revealed that doctoral level program proportions for TWU were not correlated with time as indicated by the negative adjusted R^2 score. UNT and UTD were found to have statistically significant decreases in program proportions over time (UNT significant at $p < .01$ and UTD at $p < .05$). UTA was found to have doctoral program proportions that were increasing over time, but not significantly so. None of the universities in the DFW region distinguished themselves from one another in terms of doctoral program proportions. While the inferential data might suggest the UTA was doing so, the descriptive findings revealed that UTA did not achieve the same levels of doctoral proportions as UNT and UTD. For the Austin-SA region, both UTSA and TX State had doctoral proportions that increased over time and the increase for TX State was statistically significant ($p < .05$). Both of the universities were on the same trajectory of increasing program proportions, but the levels of those proportions were too low to distinguish the universities from each other or from any other university in the study. Table 5.85 contains the details of the OLS analysis of master’s level program proportions organized by region.

Table 5.85 Simple OLS Analysis Results for Doctoral Proportions

Institution	Constant	Coefficient (t statistic)	Adjusted R^2	F	Significance of Model
DFW Region					
TWU	2.04	-.001 (-.684)	-0.153	0.468	0.543
UNT	5.953	-.003** (-6.482)	0.911	42.012	0.007
UTA	-3.132	.002 (1.605)	0.283	2.576	0.207
UTD	4.748	-0.002* (-3.326)	0.715	11.06	0.045
Austin-SA Region					
UTSA[1]	-17.194	.009 (3.758)	0.814	14.125	0.064
TX State[2]	-7.417	.004* (54.801)	0.999	3003.167	0.012

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

[1] Analysis based on four observations

[2] Analysis based on three observations

5.1.5.2.3 Summary of graduate level program proportions analyses

The inferential analyses of the graduate level program proportions provided a relatively complex picture of graduate program proportion change. For master's level program proportions among universities in the DFW region, half of the universities were found to have proportion changes uncorrelated with time, while the other half had proportions that increased over time. However, the two universities with increased proportions also had very similar proportions. In fact, all four of the universities, including the two with proportion changes uncorrelated with time, had very similar proportions. This suggests little movement in the proportion rates, which is supported by the small rates of change revealed through OLS analysis. Interpreting these findings through the lens of regional competition is a challenge without one of the universities distinguishing its self from all the others. Since both competition and mimetic isomorphic change would push universities towards increasing proportions of graduate level programs, it is difficult to argue for regional competition over mimetic isomorphic forces when both of the universities with increased proportions have similar levels of proportions.

The situation in the Austin-SA region is also complex, but not inconclusive like in the DFW region. TX State was found to have increasing master's level program proportions and UTSA was found to have decreasing program proportions. Because TX State's proportions were lower than those of UTSA, the changes in proportions for both universities actually made them more alike in terms of master's level program proportions. This does not support regional competition among the universities in the DFW region.

With regard to doctoral level program proportions for the DFW region, only one university, UTA, was found to have program proportions that increased over time. On the surface this would seem to indicate that UTA had distinguished itself from the other universities in the region, however, the university's proportions were still lower than those of two other universities in the region. So, none of the universities in the DFW region have distinguished themselves with regard to doctoral level program proportions. For the Austin-SA region, both universities were found to have doctoral program proportions increasing with time, but the neither university offered doctoral programs during the whole duration of the study period and UTSA had offered doctoral programs for at least five years longer than TX State. So, because if the relative short history of doctoral programming and the low proportions of doctoral programming, it cannot be concluded that either university within the Austin-SA region is more distinct than the other.

5.1.5.3 Research Expenditures

Examination of the average research expenditures per FT/FTW-T/TT faculty member for each institution within both regions indicated three quarters of the universities in the DFW region and all of the universities in the Austin-SA region had an average annual percent increase. For the DFW region, UTD stood out among the universities as having the largest average amount of expenditures at almost $75,000 per year. TWU had the lowest expenditures out of the universities in the region within spending averaging almost $5,700 per year. TWU was the only university to have an average annual percent decrease in research expenditures. UNT was the next lowest spender at almost $17,000 per year. UTA spent on average $35,500 per year. For the Austin-SA region, UTSA and TX State differed in their average research expenditures. UTSA spent on average twice as much per year as TX State. UTSA's average research expenditures were about $27,000 per year, while TX State spent an average of $13,500 per year. Table 5.86 contains the average research expenditures from FY90 to FY10 as well as the average annual percent changes in expenditures for each institution. The table of expenditures for each institution for each fiscal year is Appendix A.

Table 5.86 Average Research Expenditures for the DFW and Austin-SA Regions

Institution	Average Expenditures Per Year 1990-2010	Average Annual Change in Expenditures per Year	Average Annual Percent Change
DFW Region			
TWU	$5,658	-$35	-0.73%
UNT	$16,858	$90	0.53%
UTA	$34,586	$2,218	12.02%
UTD	$74,599	$3,625	6.95%
Austin-SA Region			

Table 5.86 – *Continued*

UTSA	$27,304	$1,736	9.49%
TX State	$13,558	$1,674	66.16%

Note: All expenditures inflation adjusted to 1990 dollars

Simple OLS analysis was used to determine if changes in research expenditures were correlated with time and if those correlations were statistically significant. The results of the analysis largely confirm the findings of the descriptive analysis. For the DFW region, TWU and UNT were found to have research expenditures that were not correlated with time as evidenced by their respective negative adjusted R^2 scores. UTA and UTD, however, had statistically significant increases in research expenditures over time (both at $p < .001$). UTD's average expenditure increase per year was, however, twice the amount of UTA's expenditure increase per year. Given the difference in the increase in expenditures per year and UTD's higher average expenditures per year, it appears that UTD has distinguished itself among the universities within the DFW region. For the Austin-SA region, both universities had statistically significant increases in research expenditures over time (both at $p < .001$). However, UTSA's average expenditure increase per year was notably higher than that of TX State; UTSA's expenditures increased by about $2,000 per year, while TX State's expenditures increased by about $1,200 per year. Like UTD in the DFW region, UTSA appears to have distinguished itself among the universities in the Austin-SA region. Table 5.87 contains the details of the simple OLS analysis for research expenditures and is organized by region.

Table 5.87 Simple OLS Analysis Results of Research Expenditures for the DFW and Austin-SA Regions

Institution	Constant	Coefficient (t statistic)	Adjusted R^2	F	Significance of Model
		DFW Region			
TWU	-65695.498	35.677 (.625)	-0.031	0.39	0.54
UNT	-22567.345	19.713 (.228)	-0.05	0.052	0.822
UTA	-3759367.29	1896.977*** (7.063)	0.71	49.88	.000
UTD	-7155436.97	3615.018*** (6.803)	0.694	46.286	.000
		Austin-SA Region			
UTSA	-3878211.23	1952.758*** (8.401)	0.777	70.583	.000
TX State	-2315270.384	1164.414*** (5.920)	0.63	35.046	.000

Note: * significant at < .05; ** significant at <.01; *** significant at <.001

The descriptive and inferential findings for both regions suggest that competitive forces, rather than mimetic isomorphic forces of change could be at work. If mimetic isomorphic forces were at work, then it would be expected that the universities would a) all have an increase in research expenditures, and b) would have similar levels of research expenditures. Both of these criteria were not met for the universities within the DFW region and only one of the criteria was met in the Austin-SA region. Regional competition seems to be a better explanation for the changes in research expenditures than mimetic isomorphic changes within the DFW and Austin-SA regions.

5.1.5.4 First-time, Freshmen Acceptance Rates

Examination of the institutions reveals there is a trend within both the DFW and Austin-SA regions toward increasing selectivity as all of institutions that had average annual percent decreases in their first-time, freshmen acceptance rates. For the DFW region, UNT and UTA had considerable overlap in their respective acceptance rate ranges over time. Acceptance rates for UNT ranged from 74% to 100% and the rates for UTA ranged from 72% to 98%. UTA’s rates have decreased steadily over time, but

UNT's rate decrease has been more variable. TWU and UTD also had considerable overlap in their respective rate ranges over time. Acceptance rates for TWU ranged from 48% to 97%, while UTD's rates ranged from 48% to 88%. TWU and UTD both had much variability in their rates, but UTD had a more obvious decrease over time in rates. For the Austin-SA region, acceptance rate ranges were distinct. UTSA's acceptance rates ranged over time from 83% to 99%, while TX State's rates ranged from 53% to 81% over time. Both universities had largely consistent decreases over the study time period, but rates for TX State dropped considerably in 2007, going from rates in the 70% range to rates in the 50% range. Table 5.88 contains the acceptance for all the institutions for each fall term from 1998 to 2010 along with the institutions' average annual percent change in acceptance rates.

Simple OLS analysis was used to examine the changes in acceptance rates over time to determine if changes were correlated with time and if those correlations were statistically significant. For the DFW region, the OLS model was a poor fit for TWU and UNT as their acceptance rates were not correlated with time as evidenced by the negative adjusted R^2 scores. Both UTA and UTD, however, were found to have statistically significant decreases in acceptance rate (both at $p < .001$). The rate of decrease for UTD, .034% per year, while small was about double of that for UTA, which was .019% per year. UTD appears to have distinguished itself from TWU, UTA and UNT in terms of a higher degree of selectivity. For the Austin-SA region, both universities were found to have statistically significant decreases in their acceptance rates and both had similar rates of decrease, .017% decrease per year for UTSA and .020% decrease for TX State.

However, considering the findings of the descriptive analysis, TX State had notably higher levels of selectivity and so has distinguished itself from UTSA. Table 5.89 contains the details of the OLS analysis of acceptance rates for each institution.

The descriptive and inferential findings for both regions suggest that competitive forces, rather than mimetic isomorphic forces of change could be at work with regard to selectivity of students. If mimetic isomorphic forces were at work, then it would be expected that the universities would a) all have an increase in selectivity, and b) would have similar levels of selectivity. Both of these criteria were not met for the universities within the DFW region and only one of the criteria was met in the Austin-SA region. Regional competition seems to be a better explanation for the changes in first-time freshmen acceptance rates than mimetic isomorphic changes within the DFW and Austin-SA regions.

5.1.5.5 Top 10% Applicant Rates

The universities' appeal to the most prepared high school students through examination of the applicant rate of students in the top 10% of their high school class revealed that half of the universities in the DFW region had an average annual percent increase in their top 10% applicant rate, while the other half had a decrease in their top 10% applicant rate. Both of the universities in the Austin-SA region had a decrease in their top 10% applicant rates. For the DFW region, TWU and UNT had similar rates of top 10% applicants over time; TWU's rates ranged from 5% to 15%, while UNT's rates ranged from 9% to 16%. Both universities' had an average annual percent increase in their top 10% applicant rates. UTA and UTD had similar top 10% applicant rates as

Table 5.88 First-time Freshmen Acceptance Rates of Each University in the DFW and Austin-SA Regions

Institution	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Average Annual Percent Change
DFW Region														
TWU	97%	83%	62%	53%	50%	48%	53%	65%	81%	76%	74%	70%	85%	-0.94%
UNT	84%	83%	81%	79%	77%	78%	80%	77%	100%	100%	74%	74%	76%	-0.80%
UTA	96%	98%	86%	85%	89%	79%	73%	78%	77%	75%	76%	75%	72%	-1.91%
UTD	78%	79%	88%	90%	63%	63%	51%	49%	48%	49%	51%	49%	52%	-2.53%
Austin-SA Region														
UTSA	99%	99%	99%	99%	99%	99%	99%	99%	90%	89%	83%	85%	79%	-1.59%
TX State	73%	81%	77%	76%	76%	72%	73%	76%	73%	52%	56%	53%	61%	-1.25%

Table 5.89 Simple OLS Analysis Results Acceptance Rates for Each Institution in the DFW and Austin-SA Regions

Institution	Constant	Coefficient (t statistic)	Adjusted R^2	F	Significance of Model
DFW Region					
TWU[1]	-5.806	.003 (.273)	-0.084	0.075	0.77
UNT[2]	2.249	-.001 (-.107)	-0.09	0.011	0.917
UTA	39.794	-.019*** (-6.174)	0.756	38.122	.000
UTD	69.001	-.034*** (-5.001)	0.667	25.012	.000
Austin-SA Regions					
UTSA	34.19	-.017*** (5.769)	0.729	33.277	.000
TX State	41.432	-.020*** (-4.349)	0.599	18.913	0.001

Note: * significant at < .05; ** significant at < .01; *** significant at < .001

[1] Institution with six-year section of acceptance rates from 2000 to 2005 that are likely erroneous.

[2] OLS results when anomalous observations are dropped are as follows: Constant = 15.292; Coefficient = -.007***; T statistic = -5.810; Adjusted R^2 = .766; F = 33.754; and Significance of Model = .000.

well; UTA's rates ranged over time from 8% to 20% and UTD's rates ranged over time from 9% to 26%. The higher rates for UTD occurred earlier in the 13 years analyzed, but by the latter half of the study period, their top 10% applicant rates aligned with the other three universities in the region.

For the Austin-SA region, both universities have similar top 10% applicant rates over time; UTSA's rates ranged from 8% to 16% and TX State's rates ranged from 9% to 14%. As already mentioned, both universities had average annual percent decreases in their top 10% applicant rates. None of the universities in either region appear to be distinct from the other universities in their respective regions with regard to top 10% applicant rates. Table 5.90 contains the top10% applicant for all the institutions for each fall term from 1998 to 2010 along with the institutions' average annual percent change in those rates.

Simple OLS analysis was used to examine the changes in the rate of top 10% applicants and the results largely confirm the descriptive findings. For the DFW region, TWU and UNT were found to have a statistically significant increase over time in their top 10% applicant rates (both at $p < .001$). However, as indicated by the descriptive findings, the increases among the TWU and UNT brought them to similar applicant rate levels seen among UTA and UTD. UTA and UTD were found to have top 10% applicant rates that decreased over time, but not significantly. The rates of change in top 10% applicant rates for the universities in the DFW region were very small and ranged from .003% to .006% per year. None of the universities in the DFW region was distinct from the other universities in terms of the level of top 10% applicant rates or degree of increase in top 10% applicant rates. For the Austin-SA region, UTSA and TX State were found to have a decrease over time in their top 10% applicant rates and TX State's decrease was statistically significant ($p < .05$). However, both had very small and very similar rates of change (.004% per year for UTSA and > .003% per year for TX State). This along with their almost indistinguishable applicant rate levels indicates that neither university is distinct from the other in terms on their respective appeal to the most prepared high school students. Table 5.91 contains the details of the simple OLS analysis of applicant rates of top 10% students for each institution.

If the universities within a region were competing among one another for the most prepared high school student, then it is expected that one or more of the universities would become distinct among their respective region with higher top 10% applicant rates. This is not the case for either the DFW or Austin-SA region. For the DFW region, TWU and UNT did have increases in their top 10% applicant rates, but this simply leveled the playing field between them and UTA and UTD. Even though TWU and UNT's top 10% applicant rate is increasing and UTA and UTD's rate is decreasing, the rates of change are so small, it is unlikely that TWU and UNT would have become or will become distinct from UTA and UTD. For UTSA and TX State, the two universities are on the same trajectory, progressing at almost identical rates from the same point (i.e. applicant rate levels), so neither university became distinct, nor does it seem that either will become so based on the current data.

Table 5.90 Applicant Rate of Top 10% Students for Each Institution for the DFW and Austin-SA Regions

Institution	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Avg. Annual Percent Change
DFW Region														
TWU		5%	10%	7%	6%	7%	8%	11%	14%	15%	15%	13%	14%	14.92%
UNT	10%	9%	12%	12%	14%	14%	15%	14%	14%	14%	14%	14%	16%	4.19%
UTA	18%	20%	17%	15%	15%	14%	16%	15%	15%	17%	8%	17%	16%	-0.60%
UTD	19%	26%	19%	24%	10%	11%	9%	8%	15%	14%	16%	14%	17%	-0.92%
Austin-SA Region														
UTSA	16%	8%	17%	15%	14%	12%	10%	3%	10%	10%	11%	10%	11%	-2.68%
TX State	13%	14%	12%	12%	12%	13%	13%	14%	13%	9%	10%	9%	11%	-1.35%

Note: Blank space indicates that data was not reported to the THECB for that year.

Table 5.91 Simple OLS Analysis Results for Top 10% Applicant Rates for Each Institution in the DFW and Austin-SA Regions

Institution	Constant	Coefficient (t statistic)	Adjusted R^2	F	Significance of Model
DFW Region					
TWU[1]	-20.605	.010*** (6.023)	0.746	36.281	0.000
UNT	-8.126	.004*** (4.698)	0.637	22.075	0.001
UTA	6.322	-.003 (-1.581)	0.111	2.499	0.142
UTD	119.37	-.006 (-1.518)	0.098	2.304	0.157
Austin-SA Region					
UTSA	8.481	-.004 (-1.632)	0.122	2.664	0.131
TX State	5.735	-0.003* (-2.76)	0.356	7.619	0.019

Note 1: * significant at < .05; ** significant at < .01; *** significant at < .001
Note 2: Attempts were made to obtain missing data directly from the institutions, but none was available.

[1] Missing one year of data.

5.1.5.6 Summary of Regional Comparison Findings

The evidence supporting competitive forces of change over mimetic isomorphic forces of change is mixed; competition better explains the changes in some variables over others. Program duplications are not explained fully by competition. Mimetic isomorphic change provides a more plausible explanation for the generally increasing levels of programmatic homogeneity. The absence of increasingly unique programmatic offerings within the regions indicates that competition has little to offer. The same is true for graduate level program proportions. There is a high degree of homogeneity in the levels of master's level program proportions. In both regions, there were cases where universities increased doctoral program proportions, which resulted in proportions rising to levels seen among the other universities in their respective regions. So, the increased doctoral proportions did not distinguish those universities, it simply made them more like their peers within the region. Mimetic isomorphic change is a more plausible explanation of change for graduate level program proportions than is regional competition. Changes in top 10% applicant rate are also not well-explained by regional competitive forces. There are little differences observed among the universities in both regions in terms of top 10% applicant rates. If competition was at work, then it is expected that one university would distinguish its self among the others and this is not the case.

Alternatively, regional competition does appear to be a plausible explanation for the changes in research expenditures and acceptance rates of first-time freshmen applicants for the universities with the DFW and Austin-SA regions. For both variables in both the DFW and Austin-SA region, there was a university that had distinguished its self among the other universities in the region. If mimetic isomorphic forces were at work over competition, then homogeneity in research expenditures and level of selectivity would be expected and this is not the case. These findings are not completely unexpected. Out of all the variables examined in this study, competition is most likely to be a factor in a university's changing amount of research expenditures and level of selectivity because both involve obtaining finite quantities of resources; for research expenditures, finite quantities of funding and for selectivity, finite quantities of the best and brightest students. Spending more on research means another university will be able to spend less. Enrolling more National Merit Scholars means another university will be able to enroll fewer. Developing unique programming or offering higher proportions of graduate programs does not preclude another university from offering the programming of their choice of the number of graduate programs of their choice.

5.2 Part II: Qualitative Findings

This section of the chapter contains the findings of the qualitative analysis. The purpose of the qualitative analysis was to obtain a depth of understanding of how multi-campus systems promoted institutional diversity through examination of their decisions documented in the Board of Regent meeting minutes. The findings of the analyses are organized by multi-campus system and then by three generalized content areas that correspond to the variables examined in the quantitative analysis. The content areas include programming, research and student selectivity. Relevant findings related to program duplication are contained within the programming content area; findings related to research expenditures and graduate level programming are contained within the research content area; and findings related to admissions selectivity and the universities' level of attractiveness to the most prepared students are contained within the student selectivity content area.

As described in Chapter 4, selected portions of meeting minutes from three systems were reviewed. The three systems include The University of Texas System (UTS), Texas A&M University System (TAMUS) and Texas State University System (TSUS). These selected sections are identified by different names in the respective system's minutes, but refer to the same type of information. These sections include comments/remarks by the system chairperson and system chancellor; reports from the executive committee; reports from the academic affairs committee; reports from the strategic planning committee (if such existed); and any other miscellaneous or special items. Most relevant information was gleaned from the reports of the academic affairs committees, but information from these reports varied depending on the responsibilities and duties enumerated in the respective systems' board of regents rules. Prior to the presentation of system specific findings, general findings, common to all three systems is presented.

5.2.1 General Findings

Almost exclusively, only approved items are recorded in meeting minutes. The minutes may mention an item has been removed from the agenda, but no explanation as to the reason was recorded. There is also typically no record of items that were tabled or rejected (assuming there were such items). UTS has the most detailed meeting minutes, followed by TAMUS and TSUS with both lacking in detail. Regardless of the level of detail, however, there is an obvious shift, within the UTS and TAMU's minutes, in the language used to record new program approvals beginning in the year 2000.

The shift in language was due to a change in the THECB's approval process for bachelor and master's level programming. Prior to 2000, the THECB reviewed each new program proposal. According to a personal communication from Catherine Parsoneault, Senior Program Director, at the THECB, because of limited staffing resources and the numerous program proposals, the THECB no longer reviews most bachelor and master's level program proposals. Instead, the THECB devised a policy where the institutions and their respective board of regents are required to certify that certain criteria for a new program have been met including the *Standards for Bachelor's and Master's Degree Programs.*[24] One of the standards that must be met is a demonstrated need for the program either through job market analysis or through student demand. Further, the THECB expects a minimal level of student demand to ensure that the program is financially self-sufficient.

The final general observation is that all three systems refer to strategic planning in their meeting minutes, but the previous versions of the strategic plans are not contained within the minutes. The current strategic plans for UTS and TAMUS are available on their respective websites and these documents were reviewed for this study, but TSUS did not have a strategic plan during the most recent years of the study period. When a

[24] THECB New Degree Programs and Certificate Requested, http://www.thecb.state.tx.us/index.cfm?objectid=9B93EB02-0FD4-6E46-E15D47A110934F05, accessed October 19, 2012.

request was made for the current and previous strategic plans, the TSUS representative responded that such did not exist.

5.2.2 The University of Texas System Board of Regent Meeting Minutes Findings

The UTS committee assigned to academic matters and matters related to academic institutions is referred to as the Academic Affairs Committee, AAC hereafter. Based on observations of the items approved in the minutes, the AAC was responsible for new program approvals and existing program changes as well as approvals of missions for component institutions. In addition the AAC was responsible for other matters such as approving student fee changes; administrative changes including college/school and department name changes and re-structuring of those entities; and building upgrades and capital improvements. This list is not exhaustive, but it does identify some of the most common agenda items observed throughout the study period.

5.2.2.1 Programming

Prior to 1999, UTS meeting minute entries documenting approval for planning a new program, implementing a new program or revising an existing program contained a brief description of the program including what the program would prepare graduates to do as well as resources and funding needed to implement and sustain the program. In some cases, projected enrollments were presented. In nearly all cases, there was some explanation or statement related to the need or demand for the program. The explanations typically contained more detail than the statements. For example, in the March 13, 1999 minutes, UTD was authorized to offer a M.S. in Computer Engineering with UTD's explanation that the program will "meet a strong local and regional demand for engineers knowledgeable and skilled in the design of complex systems comprised of both hardware and software" (58). The minutes, however, do not expound further on supporting documentation or source of evidence for demand.

Other new program entries refer to established local, regional or national need. In some cases, need was presumed when the proposal for the new program indicated that the program would be the first in the state or would have a unique component or focus. For example, in the February 10, 1999 minutes, UTD proposed a B.A in Gender Studies with the claim that the program differed from traditional women's studies programs because it would have a policy-oriented focus (92). A few approved new program minute entries indicated changes in industry expectations or changes within professional organizations prompted the need for the program/program changes.[25]

When unique explanations were not given to justify need or demand for a new program or substantial program change, generalized statements were included that indicated consideration was given to need/demand. Several statements are used to convey this and they are standardized in use of identical or very similar phrasing. The most commonly used statements are bulleted below:

- Program is consistent with [university's name] approved Table of Programs and institutional plans for offering quality degree programs to meet student needs.
- Program is consistent with Table of Programs, mission and plans for quality degree programs to meet student needs.

[25] Example can be found in the February 9, 2000 (65) meeting minutes. Approval of the Au.D. degree at UTD.

- Program is consistent with UT's broad-based statewide mission and its plans for offering a full range of quality degree programs to meet student needs (seen only for the flagship).

In the August 12, 1999 minutes, the UTS Board of Regents adopted the Academic Program Approval Standards at General Academic Institutions most likely in anticipation of the THECB changes in new program approvals discussed previously (134-138). This policy established principles and standards that were to be used by the AAC for program proposal review. Three overarching principles guided the formation of the program standards. The principles are listed below as stated in the minutes (italicized emphasis original):

1. *New university degree and certificate programs should be consistent with the higher education goals and mission of the State of Texas, The University of Texas System, and the offering institution*. This principle has implications not only for which programs should be offered by U. T. institutions, but also for how they are designed and delivered so as to be responsive to the needs of students, parents, the business, and public sectors.

2. *U. T. degree and certificate programs should be of excellent quality*. Program design, resources, and implementation plan, judged critically in view of the stated goals for a particular program, should compare favorably with state, national, and international standards and competing programs. In general, they should exceed minimum standards of the Texas Higher Education Coordinating Board or appropriate accrediting bodies.

3. *Academic programs at U. T. universities should represent good investments and efficient use of public and private resources*. Program choice, design, and implementation plans should reflect wise use of institutional and inter-institutional or shared resources (134).

The AAC was to apply these principles when reviewing new academic degree or certificate programs and approved proposals would be those that met five areas of standards: goals, need and fit; quality of implementation; costs and revenue; compliance;

and additional standards for doctoral programs. The compliance standard is concerned with ensuring all requirements of the THECB were met. The standards for doctoral programs were concerned with ensuring secured resources and students needed for a successful program. Standards under the goals, need and fit area are most relevant to this study and include the following (as stated in the minutes):

> *1. Program goals and educational objectives are clear.*
> *2. Connections between proposed program goals and State and U. T. System goals and mission are strong and convincing.*
> *3. Program goals advance institutional mission and strategic plan. Program is on the approved Table of Programs.*[26]
> *4. Program would meet a well-documented unmet need related to present or future manpower or social needs or regional priorities.*
> *5. Program complements and builds upon existing university programs, strengths, and resources (135).*

Following the approval of the Academic Program Approval Standards at General Academic Institutions policy, documentation of approved programs became less detailed, but the approval entries began to contain the phrase "Authorized the Chancellor or the Executive Vice Chancellor for Academic Affairs to certify on behalf of the U. T. Board of Regents that relevant Coordinating Board criteria for approval by the Commissioner of Higher Education have been met." Prior to approval of the adoption of the Academic Program Approval Standards a General Academic Institutions policy, there was implicit evidence the UTS Board wanted verification that component universities were not creating programs for the sake of creating programs. The adoption of the policy made the

[26] According to the THECB website, "The Table of Programs is a chart indicating instructional discipline areas that the Coordinating Board has approved as being within the institution's mission", http://www.thecb.state.tx.us/index.cfm?objectid=97A6606E-A298-1B3B-2C030C2AD968B5D4, accessed October 19, 2012.

expectation explicit. This policy, however, does not address program duplication or the prevention of program duplication.

There are two instances documented in the minutes where a proposed program was already offered at another institution outside of the system. The May 12, 2004 AAC meeting minutes recorded the approval of a Master of Social Work degree to be offered at UTSA. A neighboring private university, Our Lady of the Lake University (Our Lady), already offered the same program. Our Lady was originally opposed to the program, but the minutes indicated that was no longer an issue as UTSA formed some sort of collaboration where both universities would benefit (19-20). The other instance where program duplication is mentioned is in the November 9, 2005 AAC meeting minutes in reference to UTD's proposed M.S. and Ph.D. degrees in Criminology, both of which were already offered at SHSU. The explanation for moving forward with the formation of the duplicated programs was that SHSU's focus was on professional training, whereas UTD's focus would be research based (6).

The most explicit evidence that the UTS Board of Regents, or at least a portion of the Board, is aware of institutional diversity is in the AAC meeting minutes from May 14, 2008, which contains a copy of a PowerPoint presentation that was given by the UTS Executive Vice Chancellor Academic Affairs to the Academic Affairs Committee on the subject of differentiated academic missions. The presenter makes clear that mission differentiation is an asset and strength and highlights portions of the UTS Strategic Plan 2006-2015[27] that is pertinent to mission differentiation (2-12).

The Strategic Plan outlines the current academic, research and service strengths for each of the component universities as well as the vision for future strengths. For example, UTEP's strengths when the strategic plan was initiated were biomedical, health and Hispanic health disparities; border security, environmental and Earth science; emerging technologies; borderlands arts and humanities; and education of U.S. Hispanics (42). The future vision for UTEP's strengths are immigration and policy studies; defense systems; international border studies; and U.S.-Mexico business and economics. There is some overlap in strengths among some of the universities, but UTS recognizes that too much overlap would "dilute resources" (40). Based on this, it seems that UTS wants to limit program duplication.

5.2.2.2 Research

Actions or discussion about research were absent from the Academic Affairs reports through the 1990s except for it being mentioned in the individual university mission statements.[28] For example, UTA indicated in the various versions of its mission that it was committed to research.[29] UTB, on the other hand, indicated that research was part of its mission, but teaching was the primary focus.[30] UTEP noted in the earlier

[27] UTS strategic plan link http://www.utsystem.edu/osm/files/stratplan/stratplan.pdf, accessed October 19, 2012.
[28] The THECB requires that missions are reviewed periodically and the updated versions are sent to the THECB for final approval.
[29] Mission statement for UTA contained within the meeting minutes from October 7, 1994, February 5, 1997, and August 6, 2003.
[30] Mission statement for UTB contained within the meeting minutes from February 2, 1997 and August 10, 2005.

versions of their mission statements[31] that it provided opportunities for faculty and student research; however, by 2007 the version of the mission changed notably and UTEP identified itself as a "research/doctoral institution."[32] The shift in UTEP's mission was indicative of the shift towards a research focus system-wide that was observed in the minutes beginning in the early 2000s.

In 2003, the minutes began to include more about research than just the mention of it in the component universities' mission statements. In the April 10, 2003 minutes, UTS passed a resolution strongly affirming system support of UTA in several areas including its growth in research and programming at all levels (2-3). The following month, May 7, 2003, the Executive Vice Chancellor of Academic Affairs gave an overview of the UTS Research Plan that would involve consultation with high caliber scientists and engineers for the purpose of developing a plan to move UTA, UTD, UTEP, and UTSA into research expenditures of $100,000,000 annually (75-76). The following year, February 3, 2004, the board approved the mission and goals of the system (8-12). The mission is succinct and explicitly indicated that the system is to lead and sustain constituent institutions' research efforts and one of the goals is to "Build more research institutions and enhance the research presence for all UT institutions" (11).

The mid-2000s are also when research expansion began to be included as a justification in the new program proposals. The February 9, 2005 AAC meeting minutes noted in the discussion about proposed M.S. and Ph.D. Material Science and Engineering

[31] Mission statement for UTEP contained within the meeting minutes from August 10, 1995 and May 10, 2000.
[32] Quote from the November 8, 2007 (72) meeting minutes.

degree programs to be offered at UTD responded to a criticism in the formerly mentioned Research Plan, that programming at the University was too narrowly focused and this program would expand their research mission (9-10). The November 9, 2005 minutes revealed that the proposed Ph.D. degree program in Chemistry to be offered at UTEP would complement other, existing Ph.D. programs and further contribute to "the development of a broad research infrastructure in science consistent with UTEP and UTS' goals for the rapid expansion of research that builds on established areas of excellence" (65).

The UTS Strategic Plan 2006-2015, approved August 9, 2006, is substantially devoted to advancing research with one of the six strategic directions and initiatives being to "increase research, global competitiveness, and technology transfer" (5). As discussed previously, the Strategic Plan outlines where the component institutions were in 2006 in terms of academic and research strengths and where the institutions need to move in the future. The Associate Vice Chancellor for Institutional Planning and Accountability presented the essential elements of the plan to the board (also August 9, 2006) and noted that all institutions will be involved in research collaborations. The Vice Chancellor also noted the System's commitment to "strengthen the research infrastructure to identify promising ideas and develop bigger and more competitive grant proposals" (12).

More recently, the November 8, 2007 minutes contained the findings and recommendations from the Task Force on Doctoral Education and Postdoctoral Experience (18-19). One of three tasks was to consider how to "increase the competitiveness and prestige of the UTS' research, education, and service programs" (18). In summary, the recommendations from the Task Force call for integration and elevation of issues related to doctoral education and postdoctoral experience to establish and maintain competitive doctoral and postdoctoral programs that align with respective institutional missions; explicitly include doctoral and postdoctoral education in planning, budget preparation, evaluation and external communication. Most recently, the November 12, 2008 AAC meeting minutes contained the remarks made by component university presidents to the AAC during a discussion on the importance research in higher education (66).

5.2.2.3 Student selectivity

The UTS Board of Regent minutes consistently contain references to the desire for or actions towards attracting well-prepared and talented students at all degree levels. The May 11, 1995 meeting minutes documented approval of a new undergraduate admissions policy for UTPA (184-186). Prior to this time, UTPA had an open admissions policy as the institution was fulfilling a need generally filled by community colleges. With the opening of community college within their region, UTPA was able to implement admission standards in order to attract better prepared students. The minutes from the August 7, 1996 meeting recorded the approval of new admission requirements for UT. According to the minutes, the new admission standards would consider more than good grades and good tests scores. The new standards were a reaction to the impending passage of the guaranteed admission for students who graduate in the top 10% of their high school class (42). The May 7, 1997 minutes documented the approval of new admissions standards for UTA to increase the quality of freshmen, reduce the need for remediation, and improve graduation rates (46-54).

The April 10, 2003 meeting minutes, contain, as already mentioned, approval for a resolution of support by the UTS in support UTA in its research, programming and outstanding student recruitment pursuits (2-3). The minutes from the July 7, 2003 meeting called for suggestions for revising the UTS mission. At the time, the mission stated the System sought to "attract and support serious and promising students" (4-6). The UTS Strategic Plan 2006-2015 calls for "realistic freshmen and transfer admissions policies that work in coordination with community colleges" (4). The May 9, 2007 AAC meeting minutes report on a discussion that occurred among component institutions' presidents about raising admission standards, but no action was taken at the time (5-6). The minutes from November 8, 2007 contain, as already discussed, recommendations from the Task Force on Doctoral Education and Postdoctoral Experience. A key charge for the Task Force was to consider how to recruit, retain and graduate more doctoral students and postdoctoral scholars (18-19). As it is well understood in the higher education community the best prepared undergraduate students graduate at predictability higher rates than their less successful counterparts, this can be viewed as an implicit charge to attract the best and the brightest students.

5.2.2.4 Summary of the findings from The University of Texas System Board of Regent meeting minutes

From the minutes, it can be concluded that UTS Board of Regents understands the value of institutional diversity and is concerned with institutional diversity in terms of programming within the System. The strategic plan under which the System currently operates clearly outlines the programming direction for each member university. Program duplication is not encouraged per se, but it is not discouraged if there is demonstrable need or demand for such a program. The concern for demonstrable need or demand is evident throughout the study period as the new program approval entries in the minutes consistently address the issue in some form or fashion.

Evidence for the System's support of research was absent throughout the first half of the study period except for the mention of such in the component universities' mission statements that were contained as agenda items in the minutes that were presented for approval. However, in the early 2000s, there was a noticeable uptick in attention to research system-wide. The minutes included entries and discussion of the UTS Research Plan. The System mission and goals explicitly states its commitment to building research within the member universities. Research began to be discussed as a justification for new graduate programs. The strategic plan under which the System currently operates is explicit in the System's comment to research throughout the member universities. Based on this evidence, it is clear that UTS is not only encouraging, but supporting homogenization of research expenditures.

The UTS meeting minutes also provided evidence that the System is encouraging its member institutions to pursue increasingly better qualified student applicants through revisions of admissions policies that set the bar higher for admittance. In 2003 UTS affirmed its commitment to UTA in, among other things, increasingly attracting the best prepared students. Also in 2003, the minutes document a call for suggestions for revising the System mission. Part of the previous mission was a commitment to attract "serious and promising students." The Task Force on Doctoral Education and Postgraduate Experience as well as the UTS Strategic Plan 2006-2015 both commit to attracting and retaining students. In 2007, there was discussion within the AAC to increase admission standards. Attention to attracting the best prepared students was observed throughout the study period, so it is clear the System has an interest in its member universities in increasing the quality of freshman applicants. The System is encouraging homogenization of admission standards among its member universities.

5.2.3 Texas A&M University System Board of Regent Meeting Minutes Findings

The TAMUS committee assigned to academic matters and matters related to academic institutions was referred to as the Committee for Academic Campuses and then later as the Committee on Academic and Student Affairs (CASA hereafter). Based on observations on the items approved in the minutes, the CASA was responsible for new program approvals and existing program changes as well as approvals of missions for component institutions. In addition the CASA was responsible for other matters such as approving student fee and tuition changes; administrative changes including college/school and department name changes and re-structuring of those entities; faculty workload policies; granting emeritus titles; and the establishment and dissolution of research centers and institutes. This list is not exhaustive, but it does identify some of the most common agenda items observed through the study period. The meeting minutes are highly structured and largely lack detail. Agenda items are reported using the same language for the same types of agenda items. The System seems to have experimented with what they referred to as “workshop meetings” in 1993 and 1994. The minutes from the workshop meetings contained detail of the discussions that occurred. Some supporting documentation that accompanied the agenda items was available for review in the early 1990s, but not after.

5.2.3.1 Programming

New program approvals documented in the minutes is very limited. The minutes do not contain a description of the program, enrollment projections, explanations of how the program will be financed or the resources and faculty needed to operate the program. The approval entries were documented with a couple of statements that the program had met to the satisfaction of the Board some standard of need/demand, but the details of such are not recorded. Prior to 2000, each new program approval entry contained the following statements; “…in light of statutory objectives of [university name], the need of the State of Texas for students to be trained in this field, and the cost of such training…” and “The Board believes this request is justified…” After 2000 and the change in the THECB’s program approval policy for master’s and doctoral programs, a different statement was used to document approved programs, which indicated compliance with the THECB’s new process. The statement used is as follows: “The Board also authorizes the President to submit this new degree program to the THECB for approval and hereby certifies that all applicable criteria to the Coordinating Board for this proposal have been met.” For approvals for offering programs via distance education or off-campus, the following statement was used, “The Board of Regents of the Texas A&M University System finds that the program offering authorized by the minute orders is within the role, scope and capacity of the of the institution and will benefit students." Beyond this, there are a few pieces of support documentation that provide additional insight into the TAMUS Board's knowledge of and actions related to institutional diversity.

The October 16, 1990 meeting minutes made reference to a presentation by the chairman of the Committee on Strategic Planning about the committee's findings for planning (1). The presentation contains a potential vision for the System. The proposed vision is a strong flagship model type of system, where the flagship institution is a nationally recognized university with a broad range of programming at all levels. The other TAMUS institutions would provide four-year degrees as well as master's degrees in select disciplines and limited doctoral programs that reflect the land-grant/agricultural and mechanical nature of the System including agriculture, engineering, engineering technology, business, applied math and sciences as well as math and science education. Future meeting minutes did not give any indication of the direction the strategic plan ultimately took and prior strategic plans were not included in the meeting minutes.

The set of minutes from the March 10, 1994 workshop meeting included discussion of several proposed programs for TAMIU as the institution was attempting to get last minute approval or else funding would be lost. This discussion provided some insight into the TAMUS Board's knowledge of and concerns about program duplication, expectations of new program proposals including evidence of need/demand. The Board discussed concerns of graduate level program and course duplication among TAMUS and UTS universities in the south Texas region. The Vice Chancellor for Academic Affairs for TAMUS expressed concerns that his attempts to collaborate with UTS had been ignored and ultimately he feared the THECB would intervene if the systems could not work to minimize duplication between them (7). The minutes also captured one Board member's desire for more detailed new program proposals to facilitate the review and approval process. At another point in the minutes, another Board member added that if the proposals contained more information, there would be less back and forth between the Board and the university and the proposal would progress more quickly through the approval process (8). Further, the questions from a couple of Board members regarding the unique nature of the proposed M.S. in International Logistics program to be offered at TAMIU indicate a preference for more information about the unique nature of the program as well as how the program would fulfill an unmet need (10). From the workshop meeting minutes, it can be concluded that the TAMUS Board was concerned about program duplication and ensuring that programs do fulfill a need or demand. As with the UTS, the concern is more for the universities within the System as the concern expressed about duplications among the TAMUS universities and UTS universities really amount to concern about THECB intervention rather than a concern for institutional diversity within or outside the System.

The TAMUS Strategic Plan 2009-2013 provides the last bit of insight into the Boards ideas about program duplication.[33] Initiative II Excellence through Academics and Extension, Section 2.2 Expansion Geographically and Programmatically indicates the System's desire to expand programming in the high need areas of science, technology, engineering, mathematics, teacher education, and nursing (6). The objective is very

[33] TAMUS Strategic Plan 2009-2013, http://www.tamus.edu/assets/files/strategicplan/pdf/TAMUS_sp2009.pdf, accessed October 20, 2012.

clear, however, to note that this is desired only where there is appropriate level of demand.

5.2.3.2 Research

The TAMUS Board's vision for research was not well-represented in the minutes. There was only implied evidence that the system envisions most of the component institutions as research institutions or at the very least institutions that conduct research. The report for the Committee for Academic Campuses (later called the Committee on Academic and Student Affairs) in the minutes documents the approval of research centers/institutes. TAMU was approved for the lion's share of the centers/institutes and over the 20 year study period, 45 centers/institutes were approved and this does not include joint centers where the other institution or institutions were not universities (i.e. the Health Science Center or agencies of the system). The majority of the research centers/institutes were approved for established since the mid-1990s up through 2010. The following is a listing the component universities and the number of centers/institutes in parenthesis approved during the study period; TAMUS (3), PVAM (7), TAMUCC (3), TAMUK (4), Tarleton (3), TAMIU (3), and WTAMU (2). TAMUCM was the only university where there was no research centers/institutes established during the study period.

The potential vision presented to the Board back in October 16, 1990 suggested a limited research role for TAMUS member universities, but the numerous research centers and institutes that were approved for establishment across almost all of the institutions is evidence that the System either did not choose this limited course or it evolved away from this course, perhaps in the mid-1990s when approvals for research centers/institutes noticeably increased. The TAMUS mission and Strategic Plan 2009-2013 further supports that the Board envisions research as a system-wide endeavor. The current mission of the System as stated on the TAMUS website "…is to provide education, conduct research, commercialize technology, offer training, and deliver services for the people of Texas and beyond through its universities, state agencies and health science center."[34] The Strategic Plan contains four imperatives to carry out that mission, one of which, Imperative III Research for Tomorrow, is operationalized through several objectives. With regard to research, the system acknowledges its expectation that all member universities conduct research as the Plan states the System "…accepts its role and responsibility as a system of premier research institutions and commits to expand the scale, scope and effectiveness of research programs at its universities, state agencies and comprehensive health science center" (20). One of the goals of the plan is to increase research expenditures of the member institutions by $250 million by the end of fiscal year 2013 (27). Based on the evidence from the minutes, the current mission statement, and the Strategic Plan 2009-2013, the TAMUS Board expects and encourages research among its member universities.

5.2.3.3 Student selectivity

Very little was gleaned from any of the meeting minutes from 1990 to 2010 regarding the System's vision or ideas about attracting and selecting the best prepared and qualified students. Each year, generally in the September meeting meetings, it was

[34] TAMUS mission statement, http://www.tamus.edu/offices/strategicplan/, accessed October 20, 2012.

noted that the admissions policy for the System was approved, but details about the policy were not contained in the minutes nor was there an indication of whether the policy changed or remained the same. All that can be said is that the admission policy was reviewed and re-authorized annually.

5.2.3.4 Summary of Texas A&M University System Board of Regent meeting minute findings

Generally, the TAMUS meeting minutes contain limited detail about new program approvals other than a standard statement that acknowledges the program had met to the satisfaction of the Board some standard of need or demand. The greatest piece of insight came from the short-lived "workshop meeting" minutes, which contained the discussion that occurred within the meeting. This small window of information indicates the TAMUS Board was concerned about program need and demand as well as program duplication. However the discussion about program duplication captured concern about intervention from the THECB to ratify issues of duplication, so nothing about the Board's direction to member universities about program duplication can be ascertained. The strategic plan under which the System currently operates offers the last bit of insight into the Board's programming vision and that is to expand programming in the high need areas such as science or engineering and to do only where there is appropriate level of demand. So, like the UTS, the TAMUS is not encouraging program duplication per se, but it is not discouraging if either if appropriate need or demand exists.

Most of what can be said about the Board's vision for research comes indirectly from the establishment of research centers/institutes and directly from the strategic plan the System is currently operating under. A number of research centers were approved for establishment during the study period, but approvals increased beginning in the mid-1990s and continued through the end of the study period. All but one of the member universities were approved to establish research centers/institutes, so it is clear that the TAMUS Board was encouraging research among the member universities. The TAMUS Strategic Plan 2009-2013 supports this as well as the plan explicitly states its commitment to expanding research among member universities. The System is encouraging and supporting research expenditure homogenization.

Unlike programming and research, nothing can be said about student selectivity. The minutes noted that the admission policy was authorized each year, but they contain no details about whether the policies evolved over the years. The minutes do not contain evidence that the System is encouraging the member universities to actively recruit students who are among the most prepared of their peers. There is no evidence that would support whether the System is either encouraging or discouraging homogenization of admission practices or that the most prepared high school students are becoming increasingly attracted to TAMUS member universities.

5.2.4 Texas State University System Board of Regent Meeting Minute Findings

The TSUS committee assigned to academic matters and matters related to academic institutions is referred to as the Curriculum Committee, CC hereafter. According to TSUS Board of Regent Rules, the CC is required to review and approve, for all institutions within the System, course additions, deletions and changes as well as new program approvals. Further, the Board reviews and approves the continuance of courses with small enrollments and out-of-state/out-of-county course offerings. Other agenda items that fall under the responsibility of CC are member universities' mission statement changes, fee changes, and admissions data reports. Because of the nature of the CC's responsibilities, the meeting minutes for most of the study period read much like a consent agenda and contained almost no detail about the agenda items that were approved (except all the course adds/changes/deletion reports and other reports were included). This did change beginning in 2008 when minutes from the CC began to be included in the overall minutes.

5.2.4.1 Programming

Like the TAMUS meeting minutes, the TSUS meeting minutes were very structured in the language used to document program approvals. Prior to 2000 and even after the THECB passed its new policy on program approvals, program approvals were recorded with the following statement, "[University] be authorized to (add or offer) [program name]." Justifications were noted in some cases for adding, changing or deleting some courses and in most cases for courses where enrollment was so small it require special approval to be held, but this was not the case for programs. The minutes simply stated that the program was approved by the Board.

Unlike the TAMUS meeting meetings, the TSUS minutes did contain the version of the mission statement that was presented for approval. During the study period, TX State's mission was reviewed and approved on four occasions;[35] Lamar's was reviewed

[35] March 2, 1993; August 12, 1998; August 19, 2004; and August 21, 2008.

and approved on three occasions;[36] SHSU's was reviewed and approved on three occasions;[37] and Angelo's was reviewed and approved on two occasions prior to the university being transferred to the Texas Tech University System.[38] Little was gleaned from the mission statements regarding programming, except for Angelo's mission statement. In the February 22, 1992 meeting minutes, Angelo's mission statement indicated that teaching programs were the institution's primary strength, but other strong program areas were listed (255-257). Because the Board approved the mission statement, they too affirmed Angelo's programming direction. The mission statement for Angelo was reaffirmed essentially unchanged in the August 6, 1997 minutes (855-856). SHSU's mission, approved during the August 19, 1999 meeting, listed as one of the university's goals to "Offer a wide range of academic studies…" (658).

As mentioned previously, TSUS meeting minutes began, in February 2008, to contain a record of discussions that occurred in the committee meetings; however, the records of discussion typically lacked detail. The minutes from the August 21, 2008 meeting indicate there was discussion over program duplication within the System. Specifically, TX State proposed a Ph.D. in Criminal Justice, a degree program that was already offered at SHSU. The minutes state that the Chair of TX State's Criminal Justice department was at the meeting to explain the differences between the two programs. The minutes, however, do not contain a description of the differences (2). What can be

[36] April 30, 1998; November 28, 2001; and February 6, 2006.
[37] August 19, 1999; May 17, 2007; and August 21, 2008.
[38] February 21, 1992 and August 6, 1997.

concluded from this limited piece of information is that the TSUS Board was concerned, or at least concerned within recent years about program duplication within the System.

5.2.4.2 Research

All that is known from the minutes about the TSUS Board's vision for research is only what was indirectly gleaned from the mission, values, and university goals submitted for approval by member universities. The proposed mission for Angelo contained in the February 22, 1992 meeting minutes explicitly indicated that research is part of the institution's mission (255-257). The mission further indicates that the purpose of graduate education was to "train in techniques of research" (255). Angelo's mission was reaffirmed on August 6, 1997 (855-856).

The proposed mission for TX State contained in the March 2, 1993 minutes states that the purpose of the institution is teaching supported by research (155). TX State also outlined their aspirations, which include increasing graduate programs and building on their recently established research base (157-160). TX State's mission was reaffirmed essentially unchanged in the August 12, 1998 minutes (840-841). In the November 4, 1999 minutes, TX State was authorized to develop a plan to transition from a comprehensive to a doctoral university (74). By the August 19, 2004 review and approval of TX State's mission, there was a distinct difference from the previous versions. The mission statement itself was greatly shortened and TX State identified as a doctoral-granting institution. However, research was not explicitly stated in the mission, but rather mentioned as a value and listed as one of the six university goals (536-537). Specifically, TX State's goal was to develop "the university culture of research" (537).

The last version of TX State's mission to be approved within the study period occurred within and was recorded in the August 21, 2008 meeting minutes. The mission statement itself remained unchanged, but the values shifted some and indicated that graduate education was a value as well as research, scholarship and creative activity. The university no longer sought to develop a culture of research as they now valued it. The various versions of TX State's mission show an evolution in the university's commitment to research.

Lamar's mission was approved and recorded in the April 30, 1998 meeting minutes. Lamar's mission states that "research is inseparable from teaching" (262-263). Through the mission faculty were encouraged to be active scholars. Lamar's previous mission was reaffirmed and approval was recorded in the November 28, 2001 meeting minutes (56). Unfortunately, Lamar's mission was not included in the February 16, 2006 meeting minutes, only that Lamar was ordered to include the statement of core values (255).

SHSU's first mission approval during the study period did not occur until the August 19, 1999 meeting minutes (657-659). The mission statement was a single, succinct statement with no embellishment. The statement did indicate explicitly that research was part of the university's mission. Further, one of the university's goals was to "provide an educational environment that encourages systematic inquiry and research" (658). Another goal was to "offer a wide range of academic studies in preprofessional, baccalaureate, master's, and doctoral programs" (658). SHSU's mission was approved unchanged and recorded in the May 17, 2007 meeting minutes (384). However, the meeting minutes from August 21, 2008 contain approval for a revised mission for SHSU. The mission statement itself remained unchanged, but the university goals were updated, including one that indicated the university was committed to "promote scholarly and research activities that contribute to knowledge and understanding" (part of consent agenda and pages of consent agenda were not numbered).

5.2.4.3 Student selectivity

Approval of changes to admissions policies are peppered throughout the TSUS meeting minutes over the study period, but little information is contained therein about the System's vision or ideas about attracting and selecting the best prepared and qualified students. For example, the February 19, 1998 minutes indicated revisions to Lamar's graduate admissions policy were approved, but the minutes do not explain what the revisions entailed (329-333). There is only a single instance recorded in the meeting minutes that explicitly states the intention of seeking better prepared students for admission. The March 2, 1993 meeting minutes contain TX State's proposed mission and aspirations. One of the aspirations is to increase admissions criteria and restrict enrollment (157-160). Presumably, the approved changes in admission policy for TX State recorded in the September 13, 1995 (142) and May 6, 2004 (339) relate to this aspiration.

One of SHSU's goals, in all three versions of their mission presented during the study period, was to "Recruit, motivate, and retain qualified students."[39] This statement seems to indicate SHSU would be satisfied with students who do not need remediation,

[39] Most recent version of SHSU's mission presented in the August 21, 2008 meeting minutes is contained within the consent agenda and the pages are not numbered.

rather than an expression of desire for students who are among the most prepared among their peers. In fact, about half of the references in the minutes for changes in admissions policies related to provisional admissions.[40] Provisional admission policies are for those students who do not qualify for regular admission. It is unclear if these policies are becoming more or less inclusive.

5.2.4.4 Summary of findings from the Texas State University System Board of Regent meeting minutes

Information about the TSUS Board's attitude towards program duplication is very limited and comes from a single set of minutes from the late 2000s, where a discussion about a proposed duplicated program takes place. There are no details of the discussion, only that it occurred and a representative from the member university proposing the duplicated program explains how the proposed program differs from the already established program. Prior to this, new program approvals were noted in the minutes with no detail about the program or the decision to approve the program. The mission statements from member universities that were included in the minutes offer almost nothing related to programming. A couple of institutions mention their programming; one lists their program areas of strength and the other indicates their goal is to offer a wide range of programs.

While the information about programming is sparse for TSUS, much less is known about the TSUS' vision or attitude towards research. Research is only mentioned within the proposed mission statements and the System did not have a strategic plan

[40] Changes approved for provisional admissions policies referenced in the meeting minutes from February 17, 1994, May 5, 1994, February 21, 1996, February 19, 1998, and November 20, 2008.

during the latter part of the study period. Although research is included in the various iterations of the member universities mission statements and goals, each lacks the same conviction for research that is seen among the UTS member universities' mission statement versions. Teaching is most frequently cited as the primary role of the TSUS member institutions. The minutes provide only weak evidence that the system is encouraging homogeneity in research expenditures. Approval of mission statements that include research as part of the mission is an implicit endorsement of research, but that endorsement certainly lacks the strength of the endorsements observed among the UTS and TAMUS.

A bit more is known about the TSUS perspective on student selectivity, but only TX State explicitly indicated their intention of raising admission standards in order to enroll better prepared students. Many of the references in the minutes to changes in admissions policies lack explanation of the nature of the proposed change. However, since about half of those references related to provisional admissions policies, it can be concluded that students who do not qualify regular admissions standards were a focus for the member universities. The reason for this is unclear in the minutes because there is no explanation as to whether the member universities are allowing fewer or more less qualified students the chance at admission. Based on the meeting minute evidence, the System's role in encouraging or discouraging selectivity and recruitment of the best prepared students among all the member institutions is unclear.

5.2.5 Summary of Qualitative Findings and the Relationship to Quantitative Findings

5.2.5.1 Programming

Evidence exists within each of the three systems' board of regents meeting minutes that indicates multi-campus system leadership was concerned with program duplications and ensuring proposed new programs were to fulfill an unmet need or demand. It should be noted, however, that a specialized version of a program could qualify to fill an unmet need. To use a previous example, consider the M.S. and Ph.D. programs in Criminology proposed by UTD. Other programs with the same CIP code and same name were already offered at SHSU, but UTD successfully argued their programs should be approved because the focus would be research based as opposed to SHSU's career preparation focus. The point of this example is to show that multi-campus systems recognize programmatic diversity among programs within the same CIP code and even among programs with the same name.

The evidence from the meeting minutes indicating multi-campus systems concern for program duplications reinforces the point that none of the systems explicitly discouraged program duplication. However, through insistence upon fulfilling an unmet need or demand, the systems are implicitly discouraging what the THECB refers to as unnecessary duplication. Texas Administrative Code Title 19, Part I, Chapter 5, Subchapter C, Rule 5.45 Criteria for New Baccalaureate and Master's Degree Programs states that new baccalaureate and master's programs must meet certain criteria. One of the criteria is new program should not create unnecessary duplication. Specifically, point number two of the rules states "The program must not unnecessarily duplicate a program at another institution serving the same regional population. The offering of basic liberal arts and sciences courses and degree programs in public senior institutions is not considered unnecessary duplication."[41] This begs the question of whether the systems are concerned about program duplication because of the THECB's criteria forbidding it or because the multi-campus system boards see the value in institutional diversity and reducing program duplication as a means to foster institutional diversity.

Because of the limited information within the meeting minutes, this question cannot be answered definitively, but the evidence that does exist provides a hint at the answer. The TAMUS was clearly concerned about the repercussions of unnecessary duplication and for the potential consequences if the THECB became involved in resolving such issues. Evidence from UTS indicated the System was aware of the benefits of institutional diversity and valued it to the extent it was acknowledged in their most recent strategic plan. The UTS also acknowledged the financial implications of duplication and unnecessary duplication. Nothing within the TSUS meeting minutes provides insight into to the Board's view on program duplications. So, all three systems were attentive to issues of unnecessary duplication, but it is not fully clear as the motivating factors of concern.

Even though the evidence from the meeting minutes for the three systems indicate that unnecessary program duplication is discouraged, the quantitative analysis of Hypothesis 1 revealed a trend towards programmatic homogenization at all degree levels

[41] Texas Administrative Code Title 19, Part I, Chapter 5, Subchapter C, Rule 5.45, http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=T&app=9&p_dir=N&p_rloc=151771&p_tloc=&p_ploc=1&pg=5&p_tac=&ti=19&pt=1&ch=5&rl=41.

as program duplication rates have increased for a majority of institutions over time. The analysis of Hypothesis 1, however, considered all universities regardless of whether or not they were members of a multi-campus system, so it is necessary to consider the findings from Hypothesis 3. Hypothesis 3 considered differences in duplication rates for universities that are members of a multi-campus system and those that are not. When the results of Hypothesis 3 are factored in, it is clear that systems are not controlling for program duplication. The comparison of the system and non-system groups of universities revealed there were statistically significant differences between the two groups with regard to program duplications rates for all years analyzed when all degree levels are combined and the system group had significantly higher program duplication rates. When bachelor and master's level programs were analyzed statistically significant differences were found between the system and non-system group for all but the final year of analysis and again the system group had significantly higher program duplication rates. Even when the statistically significant difference disappeared, it was because the non-system group had increased program duplication rates, not because the program duplication rates of the system group decreased. Interestingly, there were no statistically significant differences found in doctoral level program duplication rates between the system and non-system groups for any of the years analyzed. Perhaps this is due to more direct oversight of new program approvals by the THECB. What is clear, however, is that multi-campus systems are not controlling for programmatic homogenization within member universities to any greater extent that what is seem among non-system universities. Further, there is no evidence from the board of regent minutes from any of the three systems to suggest otherwise.

5.2.5.2 Research

Evidence from the board of regent meeting minutes from all three systems indicates encouragement of research among member universities and commitment to support research from UTS and TAMUS. The evidence is strongest and most direct from UTS and more indirect from TAMUS. Evidence of UTS' commitment to encouraging and supporting research among member universities is in several forms in the meeting minutes including the System's research plan; a resolution affirming support of a particular member university; the mission statements of member universities included in the minutes; the System's mission and goals; the System's current strategic plan; the Task Force on Doctoral Education and the Postdoctoral Experience; and discussion of the merits of research among the members of the AAC. Evidence of TAMUS' commitment to research is indirectly affirmed through the approvals to establish a number of research centers and institutes among member universities as well as directly through the System's current strategic plan. Evidence of TSUS' support for research is indirect and weaker than that seen from UTS and TAMUS and comes from the proposed mission and goals of member universities. Each of the universities indicated that research was and is part of their mission. One institution, TX State, also indicated one of their aspirations was to increase graduate level programming.

Encouragement of research is consistent with this study's quantitative findings. The analysis of Hypothesis 1 revealed a trend towards homogenization of research expenditures. The majority of institutions examined in the study were found to be increasing their inflation adjusted research expenditures over time. However, as mentioned in the immediately preceding section, Hypothesis 1 considered all universities regardless of whether or not they were members of a multi-campus system. Hypothesis 3, however, considered the difference between universities that are in a system and those that are not. In terms of research expenditures, for the 21 fiscal years that were examined there were no statistically significant differences between the system and non-system groups except for a single year. The qualitative findings confirmed what was suspected from the analysis of Hypothesis 3, which is multi-campus systems are encouraging research expenditure homogenization.

With regard to graduate level program proportions, Hypothesis 1 revealed a trend of increasing proportions of master's and doctoral programs out of total programs among a majority of the universities in the study. This is consistent with the qualitative findings that multi-campus systems are encouraging member universities to increasingly engage in research, which is inextricably linked to graduate education. Further, the analysis of Hypothesis 3 revealed that when system and non-system groups of universities were compared, there were no statistically significant differences between the two groups for all but the last year of the analysis when master's level program proportions became significantly lower for the system group. This indicates the multi-campus systems were not controlling for homogenization of graduate level programming. However, the analysis of Hypothesis 3 for doctoral level program proportions revealed an unexpected difference between the system and non-system groups when considered in light of the qualitative findings. When doctoral level program proportions were compared for the system and non-system groups, there were statistically significant differences between the proportions of the two groups for each year that was examined and the system group had significantly lower proportions of doctoral programs than the non-system group. The precise meaning of the relationship between system membership and limited doctoral proportions can only be speculated because of the nature of the information obtained from the qualitative analysis. Perhaps the encouragement of research produced a more controlled effect on the growth of doctoral level programs not seen with master's level programs due to the greater financial commitment that would be required to sustain doctoral programs.

5.2.5.3 Student selectivity

Evidence from the UTS Board of Regent meeting minutes indicates the System and member institutions were interested in attracting the best prepared students for admission to all its member universities. Evidence from the TSUS Board of Regent meeting minutes is more limited than UTS evidence, but indicates that at least one member university was interested in attracting the best prepared students for admission. There is, however, a lack of information about the TAMUS Board of Regent's vision for the level of preparation desired for students who were to be admitted into the member universities.

UTS meeting minutes contain several references to approvals of admission policies that would raise admission requirements at member universities. The TSUS meeting minutes contain a reference to TX State's aspiration for better qualified students.

Unfortunately, the remaining bulk of references to admission policy changes in the TSUS minutes only note that revisions were proposed, but the changes were not described. Interestingly, about half of those non-descriptive revision proposals are related to provisional admissions policies. So, it is unclear if the TSUS member universities were working to increase opportunities for potential students or to increase the number of qualified applicants. TAMUS' meeting minutes only noted the TAMUS admission policy had been approved yearly, but lacked any other information about the approved policy. The meeting minute findings that do provide insight into what the approved policies contained show that some of the systems were encouraging the pursuit of the best prepared students.

Hypothesis 1 revealed a trend of an increasing level of selectivity with regard to first-time, freshmen admission rates. Given this trend, it seems reasonable to speculate TSUS and TAMUS admission policy changes were likely to have increased admission requirements. However, when the findings from Hypothesis 3 are factored in, the results of that analysis are only partially congruent with wide-spread encouragement of increasing selectivity among system universities. Comparison of the system and non-system groups' admission rates revealed statistically significant differences between the two groups for all years analyzed except the final year when the differences disappeared. Further, for more than half of the years analyzed in the first part of the study period (1998 through 2005) the system group had significantly higher acceptance rates indicating less selectivity than the non-system group. After 2005, this changed and the system group had the more selective admission rates. So, it seems it is not safe to presume that TSUS and TAMUS were encouraging increasing selectivity like their UTS counterpart. In the absence of the descriptive information related to the approved admission policies and admission policy changes, the intentions of the TSUS and TAMUS boards simply cannot be known.

The rate of top 10% applicants was not found to be trending upwards over time. Perhaps this is because these applicants have the luxury of guaranteed admission to the Texas public university of their choice, so rates of these applicants might be unaffected by stricter admission requirements and other admission policy changes. Further, there is a limitation to using top 10% applicant rates in that the composition of the top 10% pool that applies to a particular university is not known. There could have been shifts in the compositions of these pools for certain universities that are not apparent in the rates. For instance, it is likely the two research universities received applications from a greater proportion of valedictorians, salutatorians and other truly top level high school students. The findings from Hypothesis 3 did not provide any more insight as the system and non-system groups' top 10% applicant rates were found to have statistically significant differences for all but two of the years examined. There was not a discernible pattern in the years where no significant difference appeared or in which group had higher or lower rates of applicants. Even considering the qualitative findings, the top 10% applicant rate variable offers little information about whether or not Texas public universities are homogenizing in reference to students served.

The evidence from the qualitative analysis is neither overwhelming nor definitive on the multi-campus system's role in managing institutional diversity. As the findings indicate, there does appear to be an awareness of the value of institutional diversity, at least for one system, but the decisions contained within the minutes reveal the systems were encouraging program duplication, increasing research expenditures, increasing master's level programming offerings and, to some extent, increasing levels of admissions selectivity. The next and final chapter, Chapter 6, will highlight key findings from both the quantitative and qualitative parts of the study and summarize the findings relationship to mimetic isomorphic change. Policy implications that are derived from the findings are discussed as well and suggestions for future research are presented.

CHAPTER 6

CONCLUSION

This study was successful in addressing the two overarching research questions:

1. Is institutional homogenization occurring among public institutions of higher education?
2. Does membership in a public, multi-campus system have an impact on institutional diversity?

The answers to these questions are found throughout the discussion of the key findings discovered through the quantitative and qualitative analyses. Following the discussion of key findings is a discussion of policy implications related to the findings. The chapter concludes with recommendations for future research.

6.1 Key Findings

Four key findings emerged from the analyses of the research hypotheses; the alternative hypothesis, competition; and the examination of the multi-campus systems' board of regent meeting minutes. The key findings are listed below and described in detail in subsequent sections of the chapter.

- Key finding 1: Homogenization has occurred among the universities within this study.
- Key finding 2: Non-research universities have not become like the research universities in this study.

- Key finding 3: Multi-campus systems are not consistently preventing homogenization and in some cases are encouraging it.
- Key finding 4: Institutional theory's isomorphic pressures do not adequately explain the homogenization observed in this study.

6.1.1 Key Finding 1

Homogenization has occurred among the universities with this study. Through the analysis of Hypothesis 1, a trend towards homogenization was discovered for most of the variables that were examined, including program duplications when all degree levels were combined; bachelor level program duplications; doctoral level program duplications; master's and doctoral level program proportions; research expenditures per FT/FTE-T/TT faculty; and admission rates for first-time freshman applicants. These variables represent what McGuinness (1991, 4) refers to as the three aspects of an institution's mission; degrees awarded, programs offered, and clientele served. So, the universities are becoming more alike in mission, specifically in their program offerings, the level of their program offerings, the amount of money spent on research and the types of students they admit.

Programming became increasingly more similar among a majority of the universities as the rates of duplication increased over time. A majority of the universities were offering increasingly more graduate level programs as the proportion of master's and doctoral level programs out of total programs increased over time. Inflation adjusted research expenditures increased over time for a large majority of the universities. Also a large majority of the universities also were becoming more selective in their admissions decisions as they increasingly admitted a lower percentage of total applicants over time. The strongest trends in homogenization were for acceptance rates and research expenditures as at least three-quarters of the universities had increased their level of selectivity and research activity over the course of the study and over 50% of those universities had done so significantly.

With respect to the overarching question of whether public institutions of higher education are homogenizing, this research shows that the public institutions in Texas are homogenizing. The respective missions of these universities are aligning as there is less variance among the individual universities. Although there is a trend towards homogenization, not all universities were following the same course and there is still a notable distinction between the two research universities and all the other universities. This distinction is the subject of key finding 2 and is discussed in the next subsection.

6.1.2 Key Finding 2

Non-research universities have not become like the research universities in this study. Although the universities by majority measure are homogenizing, it does not mean they have become like the state's two research universities. In fact, when the research group of universities was compared to the non-research group for the analysis of Hypothesis 2, statistically significant differences were found for each variable for each year of analysis except doctoral program duplications and master's level program proportions. However, for doctoral program duplications, there was no statistically significant difference in the rates until the middle of the study period when the non-research group began to have significantly higher rates of doctoral program duplications than the research group. So, the two groups actually became less similar over time in that regard.

This divergence in doctoral duplication rates calls attention to an important and unanticipated limitation of using the comparison of duplication rates to measure whether non-research universities are becoming more like research universities. If non-research universities are becoming more like the research universities in terms of programs offered, then the duplication rates of the non-research universities will go up. The rates for the research universities may go up as well, but not to the same extent as the non-research group because the research universities already have a larger proportion of unique programs. However, the method of testing used in this study for Hypothesis 2 simply tested for differences in program duplication rates and these were found to be significantly different between the two groups. So, the non-research universities' programming could be becoming increasingly more like the research group, but their level of duplication indicated that they do not have the same level of unique programming as the research universities.

Another important finding related to differences between the research and non-research groups was the very small rates of changes that were calculated through the analysis of Hypothesis 1, which were consistently found among all universities. What this means when comparing the research and non-research groups is that it was not possible for the non-research group to catch up to the research group given the already extant gap between the two groups at the outset of the study period for most of the variables. This is most obvious in the case of research expenditures.

6.1.3 Key Finding 3

Multi-campus systems are not consistently preventing homogenization and in some cases are encouraging it. When the system and non-system groups were compared to one another, similarities and differences were found in program duplication rates and master's level program proportions and research expenditures, but both the similarities and differences were informative in indicating how multi-campus membership did not control for homogenization. There were statistically significant differences between the two groups when program duplications were compared for all degree levels combined as well as at the bachelor and master's levels, but there were no differences found at the doctoral level. The system group had significantly higher duplication rates for all degree levels combined for all years analyzed. For bachelor and master's level program duplications for the system group had significantly higher duplication rates than the non-system group for all but last year analyzed. During the last year, the system group still had a higher duplication rate, but the statistically significant difference disappeared because the non-system group's duplication rate increased. As stated previously, there were no differences between duplication rates at the doctoral level; however, practically speaking, the system group did have higher program duplication rates at that level as well.

With regard to graduate level program proportions, there were no statistically significant differences between the two groups at the master's level, although the system group did have lower proportions than the non-system group. With regard to research expenditures, there were no statistically significant differences between the two groups, but, practically speaking, the system group did outspend the non-system group in each of the years analyzed. What these comparisons show is that system membership did not have discernible impact on controlling homogenization of program offerings, master's level program proliferations, and research expenditures. The empirical findings are not surprising when evidence from the qualitative analysis is taken into consideration. Through the analysis of the board of regent meeting minutes for the systems, there is no evidence to suggest that multi-campus systems were discouraging program duplication, only the implicit evidence that unnecessary duplication was discouraged. Further the systems were encouraging research expansion including the conduction of research as well as developing graduate education.

6.1.4 Key Finding 4

Institutional theory's isomorphic pressures do not adequately explain the homogenization observed in this study. The study operated under the assumption that isomorphic pressures drive universities to homogenize; however, some of the findings call the strength of this assumption into question. Ashworth et al. (2007) clarify that strength of support for institutional theory lies in the dual meaning of conformity originally addressed by DiMaggio and Powell (1983). Evidence that strongly supports isomorphic pressures must result in both compliance and conformity. According to Ashworth et al., compliance is the movement of organizations in a particular direction. In the case of high education institutions, this would be towards the most successful universities, typically research and/or flagship institutions. Convergence, also according to Ashworth et al., is change that results in the various organizations resembling one another over time.

The descriptive analysis of Hypothesis 1 revealed the increased homogenization of bachelor level programs was not due to deliberative additions of duplicated programs. Only 50% of the institutions had an average annual increase in program duplications and the other half of the institutions either had a decrease or no change in program duplications. Further, the middle three institutional classifications (emerging research, doctoral, and comprehensive universities), those most likely to and capable of mimicking the research universities, were found most typically to have decreased duplicated programs. This study did not determine if the non-research universities were duplicating the research universities' programs or the programming offered by their peers within the non-research group. Because the source of the duplications were not considered, it is difficult to conclude whether or not increasing program duplication rates are the result of mimetic or normative isomorphic change or an alternative causal factor. In addition, Hypothesis 2 clearly indicated that non-research universities were not becoming more like research universities.

The data from the master's proportion analysis initially appeared to support isomorphic pressures, most likely mimetic pressures, for graduate programs because the proportions increased over time, but a detailed inspection of programming patterns indicated the majority of institutions within doctoral and comprehensive classifications, those universities most likely to imitate the practices of the research universities, actually had average annual decreases in their number of master's programs, thus indicating that something other than mimetic (or normative) isomorphic forces might be at work.

The descriptive data for first-time freshmen acceptance rates indicated that TTU and UTEP had average annual percent increases in acceptance rates indicating that their selectivity had not increased, but rather decreased. The inferential analysis confirmed this is the case for UTEP, but revealed that acceptance rates for TTU were not correlated with time. Again, the emerging research universities should be among the universities most likely to become more selective under the tenets of mimetic isomorphism, so these results are counter to those predictions.

Two regional comparisons, for the DFW region and Austin-San Antonio region, were conducted to test whether competition was occurring among the universities. While competition did not prove to be a factor with regard to program duplication rates or graduate program proportions, it was a viable explanation for research expenditures and first-time freshman acceptance rates. One university in each region distinguished itself among the other universities in their respective regions in research expenditures and level of selectivity, evidence of competition according to Ben-David (1972).

An alternative explanation for the increased homogeneity of programming and graduate level program proportions may be demand. Demand was not examined in this study, but it could offer an explanation for some of the findings in program duplication rates and graduate level program proportions that are counter to isomorphic pressures. For example, there were no statistically significant differences found between the master's level program proportions for the non-research and research groups of universities for any of the years compared. Further, the master's level is the only degree level where there was not a trend towards increasing programmatic homogenization. Perhaps this is due to the unique regionally specific training needs throughout the state.

The final point of this key finding relates to the very small rates of change for the variables that were consistently found among all the universities when examined for Hypothesis 1. Because the rates of change are so small, any homogenization would be very slow to progress. So, changes within the study period may have been hardly discernible both on a practical and on a statistical level. This potential ambiguity complicates the interpretation of the results of the analyses.

6.2 Policy Implications

What do the key findings mean with regard to higher education policy? Because this study revealed homogenization is occurring among Texas public universities, there is a continued need for neutral oversight beyond the systems and universities Board of Regents. This is also likely to be the case for other states that have a similar higher education coordination/governance structure as Texas, including Alabama, Colorado, Illinois, Indiana and South Carolina (McGuinness 2003, 14). Morphew's (1996) work lends credence to the need for neutral oversight as his work found in states where university systems were governed centrally there was less program duplication. Neutral oversight may become an even greater imperative in coming years as a significant portion of the public universities are vying for the chance to become a tier 1 research university. If the universities remain in a race to the top, certain sub-populations of students could be left with fewer university-level, educational options. Consider the four public universities in the DFW region, TWU, UNT, UTA and UTD, three out of four are emerging research universities with designs on becoming a premier research university.[42] The Austin-San Antonio region has three public universities; UT is a research university (not included in the regional comparison), UTSA is an emerging research university, and TX State became an emerging research university as of January 2012. This study revealed fairly high levels homogeneity within the regions and as already mentioned, competition for research resources as well as for the best prepared students.

The UT System, according to the Board of Regent meeting minutes in August 2006, was looking to model some of the University of California System's (UCS) practices, specifically establishing system created research centers in different parts of the state.[43] The UCS is the research university tier of a three-tiered system of higher education in California. If all the university systems in Texas aspired to be a UC type of system, then the impact could be substantial in terms of access and educational opportunities as almost 90% of Texas public universities are members of a university system. A report by Finney and Perna (2012) calls for Texas to set some new higher education priorities as they predict the pursuit of creating additional research universities will jeopardize education opportunities for those who are already disadvantaged. The researchers specifically point to the California model and note that it is not without complications as "… overexpansion of the university research function can come at the expense of educational opportunity" (4). One of Finney and Perna's recommendations is to change the financial model for funding community colleges (4).

[42] See Chapter 3 for description of regions used in the context of this study.
[43] UTS Board of Regent meeting minutes from August 9, 2006 (5).

Finney and Perna focus on a policy area that cannot be ignored, which is the need for community colleges to combat increasingly limited educational opportunities and educational access. Perhaps the community college's role on the higher education stage needs to be revisited to ensure there are resources to prepare students for transfer to a university, but also, perhaps, to consider expanding the role to allow these institutions to offer selected four-year degrees. This could accomplish a couple of things, 1) compensate for a loss of entry points typically available in a diverse system of higher education, and 2) free up some universities to focus on research and graduate education. David Moltz (2010), a reporter from *Inside Higher Ed,* interviewed several community college presidents and other leaders from Florida, where he notes the baccalaureate movement is the strongest. These Florida community college leaders reported to Moltz that the programs they offer and the clientele they serve are distinct from that of the four year universities and so the community college is not in competition with the universities. Without an overhaul of four-year university educational priorities, the most practical course of action for Texas may be to reconsider the role of the community college.

6.3 Recommendations for Future Research

This study concludes with five recommendations for future research. The first is a technical recommendation, which is to avoid the use of the top 10% applicant rate in future studies. The top 10% variable was intended to provide a measure of the universities' level of attractiveness to the most prepared higher school graduates, but its use in analysis did not provide any insights into which students were applying to which universities. Further, the variable muddles the students' level of preparation as there are no intermediate categories within the top 10% rate. The second, third, and fourth recommendations are related and they are to focus future research on unnecessary program duplication, constituent demand for programming, and competition among universities in terms of programming, research and students. Since this study revealed that universities are not constrained by program duplication, then program duplication could be argued to have limited meaning, thus future research should focus on whether unnecessary program duplication is occurring. If unnecessary duplication is not occurring, the future research should consider whether the duplicated programs putting a strain on already extant programs. The fifth and final recommendation for future research is to consider if changes among universities have left some populations underserved. If so, expansion of the community college role should be investigated and considered.

APPENDIX A

RESEARCH EXPENDITURES PER FT/FTE, T/TT FACULTY MEMBER FOR ALL UNIVERSITIES

Institution	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Angelo	$3,227	$1,750	$2,200	$2,086	$1,985	$2,225	$3,196	$2,926	$2,441	$2,957
Lamar	$9,927	$12,642	$10,692	$11,445	$14,341	$12,784	$11,823	$11,204	$12,958	$14,560
Midwestern	$846	$516	$1,087	$545	$405	$564	$341	$274	$715	$648
PVAM	$21,175	$19,076	$34,508	$42,713	$40,571	$45,538	$61,795	$55,456	$49,178	$5,316
SFA	$541	$3,512	$4,284	$7,184	$7,515	$9,636	$10,270	$12,234	$9,672	$11,714
SHSU	$2,265	$3,486	$3,032	$4,078	$5,768	$13,624	$13,652	$15,192	$5,253	$12,059
TAMIU	$988	$1,921	$1,505	$33,958	$8,447	$1,689	$1,576	$458	$1,107	$3,638
TAMU	$162,812	$161,659	$177,914	$188,649	$150,193	$178,809	$178,030	$207,099	$145,210	$162,561
TAMUCC	$5,624	$5,963	$11,194	$11,916	$12,162	$12,409	$7,462	$7,666	$4,139	$3,739
TAMUCM	$1,675	$140	$1,637	$1,119	$988	$2,006	$1,480	$1,548	$2,073	$2,181
TAMUK	$12,266	$12,574	$13,946	$19,216	$15,800	$21,150	$24,648	$24,740	$27,251	$25,714
Tarleton	$2,364	$4,662	$9,078	$15,746	$12,169	$12,014	$13,527	$15,070	$16,298	$18,791
TTU	$26,795	$26,670	$28,392	$30,760	$26,294	$31,268	$32,265	$38,116	$38,356	$11,115
TWU	$4,745	$4,630	$4,665	$4,053	$3,566	$4,806	$4,705	$6,391	$6,511	$6,538
TX Southern	$10,003	$13,327	$20,648	$10,197	$6,998	$13,747	$11,856	$11,960	$10,317	$10,287
TX State	$2,530	$3,792	$8,041	$11,574	$8,960	$7,547	$8,711	$6,878	$8,120	$9,218
UNT	$16,957	$16,618	$17,087	$14,420	$14,012	$18,905	$20,577	$16,595	$12,628	$16,222
UT	$98,054	$105,284	$102,127	$135,005	$108,433	$120,624	$123,747	$130,168	$118,189	$132,616
UTA	$18,454	$22,189	$20,798	$21,704	$17,748	$25,217	$39,411	$40,950	$30,834	$22,196
UTB	$338	$562	$151	$769	$815	$672	$651	$364	$548	$771
UTD	$52,175	$47,794	$58,674	$64,417	$55,251	$62,336	$58,527	$60,887	$49,747	$46,837
UTEP	$19,892	$23,873	$24,986	$32,943	$26,239	$29,751	$29,525	$35,453	$29,107	$56,399
UTPA	$2,823	$4,085	$4,583	$4,393	$4,182	$6,430	$6,173	$6,272	$5,487	$6,459
UTSA	$18,287	$18,736	$20,316	$11,971	$11,051	$12,499	$14,520	$14,018	$15,953	$23,627
UTT	$3,235	$3,077	$2,147	$4,243	$4,084	$5,001	$2,917	$3,310	$4,623	$592
WTAMU	$2,226	$2,308	$2,232	$1,019	$1,434	$6,406	$6,678	$8,522	$13,945	$8,441

All dollar amounts are in 1990 dollars.

Appendix A - *Continued*

Institution	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Angelo	$2,748	$3,134	$3,713	$2,982	$3,766	$3,003	$3,031	$2,942	$4,059	$5,778	$4,820
Lamar	$11,214	$11,154	$13,085	$11,206	$8,898	$8,893	$8,331	$10,567	$11,081	$12,283	$10,072
Midwestern	$588	$471	$395	$422	$516	$370	$282	$154	$109	$515	$841
PVAM	$45,155	$45,599	$41,269	$37,186	$36,087	$33,639	$34,365	$34,576	$31,285	$34,329	$36,935
SFA	$11,428	$8,966	$12,161	$11,349	$7,637	$8,326	$12,702	$11,262	$12,531	$20,906	$13,975
SHSU	$8,009	$5,685	$4,602	$4,149	$6,113	$6,532	$5,566	$5,343	$7,998	$15,989	$11,449
TAMIU	$3,009	$3,544	$4,484	$3,531	$1,017	$1,347	$1,147	$856	$2,268	$8,474	$10,396
TAMU	$160,508	$169,485	$172,776	$170,819	$175,138	$181,272	$177,189	$172,078	$192,522	$169,309	$238,825
TAMUCC	$15,349	$30,699	$47,255	$45,345	$50,179	$43,608	$48,710	$45,918	$39,401	$46,918	$47,033
TAMUCM	$1,915	$1,466	$2,679	$1,984	$2,260	$3,675	$3,956	$5,834	$5,224	$7,991	$8,368
TAMUK	$27,205	$24,695	$29,715	$34,996	$36,367	$40,528	$38,342	$40,273	$40,311	$42,583	$45,744
Tarleton	$18,950	$26,595	$31,269	$30,130	$30,535	$32,521	$29,049	$25,975	$25,053	$30,831	$32,410
TTU	$44,587	$41,426	$47,501	$47,147	$38,407	$36,764	$37,165	$36,050	$35,818	$57,698	$83,350
TWU	$8,759	$8,198	$8,105	$8,303	$6,262	$5,370	$4,881	$4,655	$4,837	$4,817	$4,012
TX Southern	$9,392	$11,110	$17,885	$14,335	$17,811	$22,775	$17,718	$14,558	$11,740	$9,349	$15,826
TX State	$13,881	$17,143	$14,949	$12,536	$12,111	$11,498	$14,133	$14,678	$27,719	$33,007	$37,687
UNT	$17,493	$20,156	$20,802	$18,536	$15,400	$16,132	$15,249	$13,494	$14,874	$19,002	$18,852
UT	$146,550	$157,605	$171,628	$166,243	$155,843	$162,166	$167,093	$168,698	$185,768	$188,934	$182,218
UTA	$22,939	$31,844	$32,159	$34,345	$31,569	$44,976	$43,081	$45,960	$54,897	$60,014	$65,030
UTB	$3,244	$4,382	$7,853	$9,318	$20,774	$27,052	$27,613	$23,040	$19,012	$16,020	$19,616
UTD	$50,272	$54,629	$82,454	$91,020	$75,849	$95,549	$91,878	$90,106	$125,656	$124,218	$128,310
UTEP	$56,385	$56,587	$51,438	$49,059	$53,989	$55,543	$60,814	$60,847	$66,173	$77,568	$85,042
UTPA	$6,115	$6,797	$6,095	$6,832	$8,235	$10,435	$11,076	$15,991	$17,952	$18,771	$14,885
UTSA	$28,234	$30,848	$26,626	$25,665	$27,649	$35,699	$44,310	$41,777	$41,672	$55,183	$54,741
UTT	$1,338	$2,012	$2,057	$1,891	$4,341	$2,244	$3,747	$5,833	$13,766	$12,666	$10,589
WTAMU	$9,398	$23,705	$29,611	$25,979	$22,415	$18,934	$21,108	$19,888	$24,571	$23,895	$22,202

All dollar amounts are in 1990 dollars.

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