The Impact of Revenue Diversification on the Financial and Educational Outcomes of Private Colleges and Universities during the Great Recession

by

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Abstract

The recent economic recession threatened all traditional revenue sources possessed by colleges and universities. Resultant tuition increases have led stakeholders to demand greater accountability and fostered increased focus upon strategic financing from administrators. This dissertation examines the economic and political trends that have placed the financial stability of many universities in peril. In this context, rationales for diversification are discussed including portfolio theory and resource dependence theory. Data were gathered on 814 private, non-research universities from multiple sources including the Delta Cost Project dataset and the Integrated Postsecondary Education Data System. Eight models were then developed using fixed effects regression analyses in order to assess the impact of revenue diversification and tuition dependence on the financial and educational outcomes of these institutions. While effects on educational outcomes were marginal, increasing revenue diversification in the years preceding the recession resulted in greater year-over-year total revenue per student but significantly reduced instructional expenditures per student. Implications are discussed both for public policy and institutional strategy.

Chapter One

Introduction and Problem Statement

Introduction

In December 2007, the United States entered its longest economic recession since the Great Depression (Goodman, 2009; Mishel & Shierholz, 2009; U.S. Department of Labor, 2010). The social and financial consequences of this downturn, which followed an eight month recession in 2001, have intensified changes in higher education finance that began in the 1970s (American Association of University Professors [AAUP], 2012; Jones & Wellman, 2010; Knecht, 2009; State Higher Education Executive Officers [SHEEO], 2013; Von Drehle, 2010). Caused by a "perfect storm" of financial and political factors, recent declines in traditional revenue sources have left administrators scrambling to find the necessary dollars to maintain existing levels of services (AAUP, 2012; Ehrenberg, 2006; Weisbrod & Asch, 2010). In the last 15 years, the resultant tuition increases, which have far outpaced the rate of inflation, have raised numerous concerns and protests over access and equity. Additionally, continuous spikes in tuition have dramatically increased the amount of student loan debt possessed by 21st century graduates, and led prognosticators and scholars alike to suggest that the United States is in a "higher education bubble" likely to burst in the near future (Cronin & Horton, 2009; Lips, 2010; Reynolds, 2012). Tuition rates and student loan burdens can increase only so much before the current model of higher education financing becomes unsustainable.

Problem Statement and Significance

Because higher education has generally boasted increasing student demand, limited competition, and high-growth endowments, some have viewed higher education as recession proof (Flamini, 2012; Wilson, 2008). Public colleges and universities have also traditionally benefited from strong state support. When unprecedented economic conditions arose in the most recent recession and proved that the financing of higher education was keenly sensitive to economic and political factors, many colleges and universities had no administrative answer. As Jones and Wellman (2010) argued, "This recession has clearly demonstrated that the financing problems affecting higher education are not short-term but structural. They are born of bad habits and an inattention to strategic financing and resource allocation" (p. 9). As external forces threaten traditional revenue sources, stakeholder concerns have grown and administrators have begun to realize the value of having a diversified revenue portfolio. However, the rationales for diversification within the field of higher education are decidedly underdeveloped. Additionally, there are no empirical studies within the field that examine the effects of revenue diversification upon institutional outcomes.

A deeper understanding of the rationale for revenue diversification and a preliminary analysis of its effects upon an institution's financial and mission-related outcomes are necessary before intentional diversification initiatives can be effectively implemented. This dissertation critically assesses the prevailing perceptions of diversification's purpose so that stakeholders can more accurately understand why revenue diversification is a sound strategy. The study then develops a conceptual model to assess the impact of changes in revenue diversification, as well changes in state policy and institutional context, on three financial and five educational outcomes during the recent recession. The rest of this introduction focuses on providing the reader with an

understanding of how and why unprecedented conditions have increased interest in revenue diversification strategies throughout the field of higher education.

Threats to Traditional Revenue Sources

In this section, I examine the short-term and long-term trends in four historically dominant revenue sources, paying special attention to economic and political forces that have challenged the status quo of higher education financing and led many administrators to consider revenue diversification strategies. The three largest sources of revenue for instruction at private colleges and universities are tuition, charitable giving, and endowment income. Public institutions have these three sources plus state appropriations (AAUP, 2012; Ehrenberg, 2006; Weisbrod & Asch, 2010). Appendix A displays the historical trend of revenue sources for each major Carnegie classification, an often employed typology for classifying institutions. These classifications are differentiated based primarily on the level of degree offering (associates, Bachelor's, Master's, Ph.D.) and institutional control (public, private). The data, gathered from the Integrated Postsecondary Education Data System (IPEDS), show dramatic shifts in the revenue sources used to fund operations at every institutional type. Whether measured in inflation-adjusted dollars or as a percent of total revenue, state and local appropriations have witnessed a significant decline across all institutional types for each of the one-, five-, ten-, and twenty-year periods. To compensate for this loss in state funding, tuition–both in inflation-adjusted dollars and as a percentage of institutional revenue–increased in public universities over the same period of time.

Endowment income. A wealth of literature has chronicled the staggering endowment losses in 2008 and 2009 (AAUP, 2010; Barton & Gose, 2010; Blumenstyk, 2009; College Board, 2010; Delta Project, 2010; Farkas, 2008; Goodman, 2009; Masterson, 2008a, 2008b; National

Association of College and University Business Officers [NACUBO], 2010; Weisbrod & Asch, 2010; Wilson, 2008; Wolinsky, 2009; Zezima, 2009). Endowments fell on average 23.2 percent in fiscal year 2009, representing a collective loss of $96.9 billion in the sector. The five largest endowments managed by Harvard, Yale, Stanford, Princeton, and the University of Texas, respectively, lost a collective total of $29.8 billion, or 27 percent of their overall value. Harvard's endowment alone lost $10.9 billion–more than the *total* endowment of all but four other universities (NACUBO, 2010). Endowment losses affect not only the funds available for operations but also capital spending, potential for fundraising, and credit strength (Goodman, 2009).

The primary critique of endowment administrators has been that their investment decisions allowed for inappropriately high levels of risk in an environment consumed with (and highly compensated for) achieving maximum short-term gains. Rather than utilizing their endowments to sustain programs when other revenues declined, administrators invested as if the primary goal was to increase endowments to their highest possible level (Weisbrod & Asch, 2010). During the last decade, the investment mix–particularly within the nation's largest endowments–shifted away from traditional, blue-chip stocks that typically yield a steady return, toward illiquid, risky assets such as hedge funds, private-equity ventures, and real estate (Blumenstyk, 2009; Farkas, 2008; Weisbrod & Asch, 2010; Wolinsky, 2009). Although endowments under $25 million invest an average of 93 percent of their portfolios in liquid and fixed-income assets like stocks and bonds, endowments over $1 billion place only 50 percent of their portfolios in such investments (Weisbrod & Asch, 2010). While this complex strategy yielded higher than average returns during peak market years, many administrators were unable to access or reallocate funds when the economy entered a recession and values quickly tumbled.

The largest endowments, which had realized the highest returns throughout the prior two decades, suffered the largest losses during the economic downturn (AAUP, 2010; Barton & Gose, 2010; Zezima, 2009).

These investment losses, while historically unprecedented, have received a disproportionate amount of coverage in the literature when compared to the associated funding consequences. Although a few elite institutions draw as much as 45 percent of their operating revenue from endowment payouts, endowment funds comprise a relatively small percentage of the operating revenue at non-elite institutions, which serve the mass majority of American students (Bianco & Rupani, 2007; Blumenstyk, 2009; Ehrenberg, 2006). Even before the market decline, less than 4 percent of American colleges and universities had endowments in excess of $500 million. These wealthy institutions collectively serve just 3 percent of the undergraduate students in America (Weisbrod & Asch, 2010). According to data gathered by Weisbrod & Asch (2010), 85 percent of American colleges and universities have endowments of $100 million or less. Of the 839 institutions reporting endowment levels in the 2012 NACUBO survey, the median endowment was just $93.4 million. Even in good times, the average endowment contributes only a few million dollars to annual operating funds at most institutions. Furthermore, a third of community colleges, 11 percent of four-year colleges and universities, and nearly all for-profit institutions report having no endowment (Weisbrod & Asch, 2010). The fact that the top 30 institutions possess 54 percent of total endowment funds suggests that the consequences of recent market declines may be relatively isolated to the richest one percent of institutions (NACUBO, 2013). If so, the endowment decline may actually bring more equity to the field as the resource gap between elite and non-elite institutions narrows.

Further softening the effect of these losses is the fact that endowment payouts are often

calculated using a rolling average (often three or five years) of total endowment value. These payout strategies smooth the effect of market fluctuations upon annual revenue. Institutions typically spend just 4 to 5 percent of their endowment funds to support annual operations with the average for the 2010–2011 academic year found to be 4.5 percent (AAUP, 2012; College Board, 2012). In 2010–2011, endowments over $1 billion spent the highest rate (5.2 percent), while endowments under $25 million spend the lowest (3.7 percent) (College Board, 2012).

The relatively small consequences of endowment losses can be easily seen through a basic example. For an institution using a five-year rolling average and paying out an aggressive 5 percent of its endowment each year, a 25 percent decline in endowment value will result in only a 5 percent decline in endowment revenue the following year. If the institution relies upon its endowment for 20 percent of its annual revenue (which is a relatively high percentage for the average college or university), total revenue will decline by just 1 percent. Frequently obscured by the shock of recent losses is recognition that for the ten years ending June 30, 2008, the average endowment rate of return was a positive 6.5 percent per year (Blumenstyk, 2009). Even after historic declines in 2008 and 2009, endowments only fell back to 2003 values. Furthermore, most endowments rebounded in fiscal years 2010 and 2011, with average increases of 10 percent and 17 percent, respectively. These returns have brought endowment values back to approximately their 2005–2006 levels (College Board, 2012).

While much of the recent literature focuses on dramatic endowment losses, I have shown that these losses have a relatively small effect on the total annual revenue of the average American college or university. In order to understand the complete set of economic and political forces that have led administrators to consider diversification strategies, one must also consider recent changes in charitable giving, state appropriations, and tuition.

Charitable giving. Investment losses and economic uncertainty have led to significant declines in charitable giving, both in total and within the higher education sector. According to the Giving USA Foundation (2009, 2010), charitable giving fell a combined 13 percent in 2008 and 2009. Taken together, 2008 and 2009 represent the first consecutive years of decline and only the second and third individual years of decline since the foundation began publishing annual reports in 1956. Charitable giving edged up in 2010 and 2011 with gains of 2.1 percent and 0.9 percent, respectively, but the cumulative effect of such declines was that total charitable giving in 2011 was 10 percent below that of 2007.

The Council for Aid to Education (CAE, 2010) reported that giving to higher education experienced even greater declines. According to CAE's survey of 1,027 colleges and universities, charitable gifts to postsecondary institutions declined 11.9 percent from 2008 to 2009–the largest annual drop in the more than forty years that the Council has collected data. Although not all institutions complete the Council's survey, it captures approximately 85 percent of the total voluntary support to American higher education. Two-thirds of surveyed institutions reported declines from 2008 to 2009, with higher than average declines coming from individual giving. Gifts from individuals typically account for half of all charitable gifts received by colleges and universities. In 2009, however, individuals accounted for only 43.5 percent of gifts received. Alumni who gave in any measure to their alma mater declined from 11 percent to 10 percent, representing the lowest level ever recorded by the survey (CAE, 2010). Sectors that receive gifts through capital campaigns or as contributions to endowments typically see the largest decreases during recessions as donors respond to societal needs that are perceived to be more immediately pressing (Giving USA, 2010). For 2010, giving to colleges and universities edged up only slightly by 0.5 percent, signaling that the effects of the recession on charitable

giving may be long-lasting. With increased uncertainty regarding financial markets, United States tax policy, and governmental relations, many believe that annual giving will continue a sluggish recovery.

While a portion of charitable contributions are used for capital purposes or placed into the endowment for long-term investment, for many institutions gift revenue represents a larger share of operational revenue than do endowment payouts (AAUP, 2012; Weisbrod & Asch, 2010). Liberal arts colleges, for example, have historically drawn between 22 and 25 percent of annual revenue from charitable giving. In 2009, however, an 18.3 percent decline in giving resulted in charitable gifts accounting for a historically low 17.1 percent of their total revenue. Before 2009, the component of annual revenue provided by charitable giving within the liberal arts classification had never fallen below 22 percent (CAE, 2010). Despite consistent and substantial investments in advancement divisions, many colleges and universities have experienced significant challenges of late in attracting these important funds.

State appropriations. The research describing and analyzing the declining role of state funding is perhaps the largest area of literature within higher education finance, and justifiably so. For the 77 percent of American institutions that are publicly controlled, state and local appropriations have historically represented the largest source of revenue. However, as the tables in Appendix A show, 2010 was the first year on record in which net tuition revenue per full-time equivalent (FTE) student exceeded state and local appropriations per FTE for public masters and public research universities. Although typically less material to private institutions, government funds are directly received by private institutions through institutional grants or contracts, or may be indirectly received via governmental grants provided to students. Since the peak year of 1976, state funding to higher education has declined regardless of whether

measured in appropriations per full-time equivalent student, in comparison to total higher education revenue, by its percentage of total state spending, or by appropriations per $1,000 of individual income. Over the past five and ten years, inflation-adjusted state appropriations to higher education fell 3.8 percent and 8.2 percent respectively. Despite significant increases in FTE enrollment described below, the $79.1 billion of state appropriations received in 2001 fell ever so swiftly to $72.6 billion in 2011 (SHEEO, 2013).

When analyzed using appropriations per FTE student or as a percentage of total higher education revenue, the decline in state support is even more striking. On top of a 5 percent decline in the 1990s, inflation-adjusted appropriations per FTE student fell 24.4 percent from $8,316 in 2001 to $6,290 in 2011. For the years 2009, 2010, and 2011, appropriations per FTE student declined 6.3 percent, 6.9 percent, and 3.7 percent, respectively (SHEEO, 2013; College Board, 2012). Enrollment, which increased to a record high 11.8 million FTE students in 2011, is partially responsible for this trend. Fiscal 2011 FTE enrollment represents increases of 16.9 percent, 32.9 percent, and 64.0 percent over FTE enrollments five, ten, and twenty-five years prior (SHEEO, 2013). State appropriations, however, have not proportionately supported the increased demand forcing administrators to find other revenue to expand capacity. Essentially, colleges and universities today are being asked to educate many more students with much less public support.

Secondly, the data in Appendix A show that state and local appropriations have fallen to between 20.9 percent and 46.5 percent of total public institution revenue, depending upon Carnegie classification. Compared to ten years prior, this component of total revenue has fallen between 9.6 and 13.2 percentage points. Compared to twenty years prior, this component has fallen between 16.0 percent and 21.6 percentage points. Zeiss (2003) described the phenomenon

as a "permanent shift from being public-supported to being public-assisted" (p. 53). Higher education funding has also lost out as measured by its relative percentage of the average state budget. Higher education's percentage of total state spending has declined from 7.8 percent in 1978 to 5.9 percent in 2006 (Kane, Orszag, & Gunter, 2003; Rizzo, 2006). Longanecker (2006) estimated that had higher education maintained its 7.8 percent share of total state spending, an additional $21 billion would have been available to colleges and universities in the year 2000.

Measured a final way, taxpayer effort related to the funding of higher education peaked in 1978 at $10.56 per $1,000 of personal income but has since declined in each subsequent decade. Higher education appropriations per $1,000 of individual income fell to $9.74 in 1990, $7.36 in 2000, and $5.63 in 2011 (College Board, 2012). Changes in tax effort are frequently driven by citizen interest and attitude toward higher education, the proportion of students enrolled in public institutions (the Northeast region with its high number of private colleges yields the lowest average for higher education tax effort), the attitude of citizens regarding their government and taxes, the amount of taxes paid for other state programs, and the wealth or fiscal capacity of a state (Alexander, 2003). Mortenson (2004) estimated that had individual effort for higher education funding remained at 1978 levels, public institutions would have received an additional $33.4 billion in the year 2004. By all measures, state support of higher education is declining.

The literature provides a long list of economic and political reasons for the downward trend in state appropriations. First, state budgets have been dramatically constrained by two economic recessions in the last decade as well as citizen-led tax revolts (AAUP, 2012; Archibald & Feldman, 2006; College Board, 2012; Delta Project, 2010; National Council for State Legislatures [NCSL], 2009; SHEEO, 2013; Weerts & Ronca, 2008; Weisbrod & Asch, 2010).

The primary revenue sources for state budgets are general sales taxes, property taxes, and personal income taxes (Callan, 2002; SHEEO, 2013; Weisbrod & Asch, 2010). Weerts and Ronca (2008) found that unemployment is the single, strongest indicator of overall state revenue, and a particularly strong driver of sales tax revenue and income tax revenue. As the recession increased the unemployment rate (which according to the U.S. Bureau of Labor Statistics rose above 10 percent in 2009 for the first time in 26 years) and lowered individual incomes, state income tax revenue significantly declined. Lower individual incomes have also resulted in reduced spending and diminished state sales tax revenue. As a result, most states "experienced budget deficits of unprecedented size," exceeding even the adjusted forecasts that were made at the onset of the recession (AAUP, 2010, p. 10).

Complicating these fiscal challenges, state legislators have found themselves unable to raise additional revenue due to growing anti-tax sentiments and voter-passed resolutions that limit tax increases and government spending (Hovey, 1999; Primary Research Group, 1997; Weerts & Ronca, 2008; Winston, 1998). Beginning in 1976, 23 states enacted tax and expenditure limitations (TELs) that limit state revenue or total state spending to inflation growth and/or population growth. The introduction of these TELs explains over half of the previously discussed decline in taxpayer effort related to higher education financing (Archibald & Feldman, 2006; Mortensen, 2004).

All credible agencies predict that recovery of state tax revenue will take several years. A recent *Time* magazine cover story reported that 28 states have ordered across the board budget cuts (Von Drehle, 2010). The National Conference of State Legislatures (2009) reports that state budgets have now receded to levels consistent with the previous decade. Based on initial expenditure estimates, state revenue nationwide was projected to fall $224 billion short for fiscal

year 2010. Thirty-five states estimated a budget gap of $55.5 billion for fiscal year 2011 while 23 states estimated a budget gap of $68.8 billion for fiscal year 2012 (NCSL, 2009). Eleven states are projecting budget gaps in excess of 10 percent through fiscal year 2013 (Von Drehle, 2010). One has to go back to the 1930s to find a period of comparable fiscal challenges at the state level.

Although state budgets are drowning in the red, a more significant reason for the reduction in state appropriations is the thirty-year decline in the percentage of state budgets allocated to higher education. As previously stated, higher education's share of state budgets has fallen from 7.8 percent in 1978 to 5.9 percent in 2006. A shift in state funds toward K-12 education, Medicaid, welfare, and corrections is primarily responsible for the reduction in public funding of higher education (Archibald & Feldman, 2006; Breneman, 2002; Cheslock & Gianneschi, 2008; Ehrenberg, 2006; Hauptman, 1997; Hossler, Lund, Ramin, Westfall, & Irish, 1997; Hovey, 1999; Kane, Orszag, & Gunter, 2003; Kelderman, 2009; Longanecker, 2006; Mortensen, 2004; Mumper, 2001; Rizzo, 2006; Von Drehle, 2010; Weerts & Ronca, 2006, 2008; Weisbrod & Asch, 2010; Zumeta, 2007). In fiscal year 1990, Medicaid surpassed higher education as the second largest component of state budgets (Hossler et al., 1997). Together, K-12 education (the largest component) and Medicaid costs now comprise over half of the average state budget (Von Drehle, 2010). Correctional costs, though a smaller portion of overall state spending, have more than doubled as a percentage of state budgets since 1980 (Kane, Orszag, & Gunter, 2003).

As the baby boomer population ages, the United States population over 65 is estimated to increase from 35 million in 2000 to 70 million in 2030 (Kane, Orszag, & Gunter, 2003). The proportionate costs from this caseload increase as well as the continual rise of prescription drug

costs have led to numerous forecasts that Medicaid will continue its squeeze on higher education funding in the coming years (Kane, Orszag, & Gunter, 2003; Rizzo, 2006; Weerts & Ronca, 2006; Zumeta, 2007). Because higher education funding is not mandated on a per student basis as are other budget components, and because colleges and universities can increase tuition charges to offset appropriation shortfalls, many state legislators have regarded higher education as a discretionary budget item (Callan, 2002; Cheslock & Gianneschi, 2008; Hovey, 1999; Mortensen, 2004; Zumeta, 2007). Rizzo (2006) argued that "higher education is the single largest discretionary item in state budgets" (p. 4). When state legislators are forced to cut spending, higher education is typically first on the chopping block. Hovey (1999) argued that higher education acts as a balance wheel for state budgets. When state revenue falls or other mandated expenses rise, higher education appropriations are disproportionately looked to as a means to balance the overall budget. Changes in state fiscal conditions, then, are often multiplied in their impacts on higher education (Breneman & Finney, 1997; Callan, 2002). Unfortunately, when state economies recovered from recent recessions and legislatures again had surplus budgets, higher education funding was not proportionately increased in order to restore past cuts.

Others have argued that incentives in federal public policy with respect to Medicaid and higher education expenditures have exacerbated the decline (Alexander, 2003; Kane, Orszag, & Gunter, 2003; Rizzo, 2006). Through a matching formula, a state that spends more on Medicaid is rewarded with a proportionate increase in federal funds. In contrast, when a state spends less on its public colleges and universities, and the institutions respond by increasing tuition, state residents qualify for higher federal Pell Grants, subsidized loans, and tax credits. Put another way, state spending on higher education is indirectly "taxed" through related reductions in the

federal benefits received by constituents. A state gains net revenue, then, by increasing its Medicaid expenditures and slashing its higher education funding.

Based on the rate of decline in state appropriations to higher education from 1978 to 2004, Mortensen (2004) estimated that twenty states will reach zero appropriations to higher education by the year 2050. While most institutions remain public, the failure of higher education to compete for state resources has led to de facto privatization for many institutions. Taken together, these factors suggest that state appropriations to higher education are not likely to rebound in the coming years but, rather, may face even more reductions. Public institutions can no longer rest assured that their operations will be financed primarily by state coffers.

Tuition. Because state support for public colleges and universities has historically been greater than tuition revenue, any percentage reduction in state appropriations requires a larger percentage increase in tuition to offset it (Boatman & L'Orange, 2006; Corey, 2007; Kane, Orszag, & Gunter, 2003; McPherson & Schapiro, 2000). As a result of the aforementioned reductions in state appropriations and other traditional sources, tuition and fees have risen dramatically. Over the past 25 years, the average cost of tuition and fees has increased faster than individual income, disposable income, consumer prices, and even health insurance (Ehrenberg & Rizzo, 2004; Hauptman, 1997; Hossler et al., 1997; Knecht, 2009; Larson, 1997; Toutkoushian, 2001; SHEEO, 2013; Zemsky, Shaman, & Shapiro, 2001). Table 1 shows the increase in inflation-adjusted tuition and fees for selected years. For 2012–2013, average tuition and fees for public two-year colleges, public four-year institutions, and private four-year institutions were $3,131, $8,655, and $29,056, respectively. In real dollar terms, these totals represent increases of 4.3 percent, 3.4 percent, and 2.8 percent compared to the prior year (2011–2012). When compared to decades prior, the burden placed upon today's students and families is

astounding. In comparison to their predecessors 10 and 30 years prior, the tuition burden on students at public four-year institutions–in inflation-adjusted dollars–is 66 percent and 257 percent higher, respectively.

Table 1
Average Tuition and Fees in Constant 2012 Dollars*

	Fiscal Year				
Institution Type	1982–83	1992–93	2002–03	2011–12	2012–13
Public, 2yr	$1,111	$1,820	$2,129	$3,001	$3,131
Public, 4yr	$2,423	$3,806	$5,213	$8,372	$8,655
Private, 4yr	$10,901	$17,037	$22,974	$28,276	$29,056

* Amounts are inflation-adjusted and measure the real economic change in tuition and fees.
Source: College Board, 2012

During the 2000s, the average annual tuition and fees increase at public four-year colleges and universities exceeded the average annual inflation rate by 4.9 percent (AAUP, 2010). Although rising costs have had some effect, a quick analysis of revenue components over time demonstrates that *cost shifting* has played a significant role. Johnstone (2005) rightly argued that higher education revenues are "a zero-sum game, in which a lessening of the burden upon, or revenue from, one party must be compensated by either a reduction of underlying costs or by a shift of the burden to another party" (p. 380). As a percentage of total revenue, tuition and fees have increasingly picked up the lion's share for lost state appropriations and other subsidies. For public institutions, tuition as a percentage of total revenue was 43.3 percent in 2011, up dramatically from its 29.4 percent share in 2001 and its 23.2 percent share in 1986 (SHEEO, 2013). The Delta Project on Postsecondary Education Costs, Productivity, and Accountability (2010) found that during the 2000s, a noticeable change in public higher education financing occurred in which "institutions began to shift significantly more of the costs of education onto students" (p. 30). The report goes on to state that "the student share of costs is

rising primarily to replace institutional subsidies – and not to enable greater spending" (Delta Project, 2010, p. 32). Johnstone (2005) concluded that "rising tuitions in the public sector are overwhelmingly caused by withdrawal of state tax revenue and a shift in relative cost burden from the taxpayer to students and parents" (pp. 378–379; see also Faulkner, 2005; Hauptman, 1997; Hossler et al., 1997; and Weerts & Ronca, 2006). Ehrenberg (2006) captured the philosophical change which has led to this shift in the higher education cost burden:

> Traditionally, public higher education has been viewed as a social good that yields benefits to the nation as a whole. But as earnings differences between highly educated and less educated individuals have widened–and the private economic return higher education provides its students has grown–policymakers have concluded that those students and their families should pay a greater share of the costs of public higher education. (p. 48)

The benefits-received principle holds that "individuals should be charged or taxed in accordance with the marginal benefits they receive from investment in the activity" (Paulsen, 2001b, p. 112). As arguments that higher education is a private good have taken root, public funding has declined. While students at many institutions are paying considerably more, they are not necessarily getting more (Scarlett, 2004). In 2010, tuition became the largest revenue source at public masters and public research universities. If trends continue, tuition will become a greater revenue component than state and local appropriations for public Bachelor's institutions in the next few years.

The most recent tuition and fee increases come at the most inopportune time for students and families who have seen their ability to pay for higher education decline due to lower investment returns, falling home values, and rising unemployment. As heavily chronicled in the literature, higher tuition and fee charges have a negative effect on student access, institutional choice, retention, and degree completion with a disproportionate effect on low-income and

minority students (Chen & DesJardins, 2008; Ehrenberg, 2006; Ellwood & Kane, 2000; Hearn & Longanecker, 1985; Heller, 1997, 1999; Hill & Winston, 2006; Hossler et al., 1997; Kane, Orszag, & Gunter, 2003; Leslie & Brinkman, 1987; McPherson & Schapiro, 2000; Pratt, 2003; St. John, 1990; Toutkoushian, 2001; Weerts & Ronca, 2006). Tuition and fee costs have persuaded many students to forgo higher education. A good percentage of those who do enroll have shifted to lower-cost public institutions and two-year colleges (Goodman, 2009; Hossler et al., 1997; McPherson & Schapiro, 2000; Weisbrod & Asch, 2010). Finally, average student loan burdens increase dramatically when tuition and fees are raised, particularly as federal aid policy has shifted from grants to loans (Baum, 2001; Breneman, 2002; Fossey & Bateman, 1998; Hauptman, 1997; Hossler et al., 1997; Longanecker, 2006; Madrick, 2004; Reynolds, 2012; Tannock, 2006).

Conclusion. Rizzo (2006) did not overstate the matter when he wrote that "policies of broad state support and low tuition are historical relics" (p. 30). Administrators and governing boards are beginning to realize that additional increases in tuition cannot be made without sacrificing student access and other educational goals. Cheslock and Gianneschi (2008) argued that "when tuition dollars cannot be increased further, higher education institutions will become especially reliant upon alternative revenue sources" (p. 210). It appears that this time is upon us now. As I have shown, most major revenue sources have experienced dramatic fluctuations in the last decade. Excessive reliance upon any one of these sources may expose an institution to significant risk. Aware of this potential, administrators have increasingly begun to consider initiatives to improve the diversification of their institution's revenue portfolio.

Purpose of Study

Despite renewed interest in revenue diversification, there has been no targeted study in the field of higher education that clarifies how a more diversified revenue portfolio might empower institutions to improve certain outcome measures. This study aims to fill a portion of this knowledge gap by examining the effects of changes in diversification upon the financial and educational outcomes of colleges and universities. If significant benefits are found, this study will lend support for new initiatives beyond the traditional staples of higher education finance, freeing administration to think outside the box in finding diverse streams of revenue to reliably support their mission-driven institutions. Additionally, because of the time period selected, the study may find that revenue diversification in the years immediately preceding a recession is an essential strategy that can protect institutions in the economically challenging years that follow.

Organization of the Study

Chapter One has presented an introduction to the study, and outlined both the present problem faced by higher education financing and the study's primary research question. In Chapter Two, an extensive literature review examines existing research on revenue diversification both within the field of higher education (limited) and within the management discipline (more extensive). This review provides the theoretical groundwork for the conceptual model, which is then discussed and developed in Chapter Three. Chapter Four describes the study's research methods and design, including a description of the institutions in the sample. Chapter Five presents a detailed analysis of the study's results. Finally, Chapter Six includes a discussion of the findings and their implications for both higher education administrators and scholars seeking to expand upon this research.

Chapter Two

Review of the Literature

Parameters of the Literature Review

The purpose of this chapter is to introduce, summarize, and critique existing rationales for revenue diversification and to present empirical evidence linking revenue diversification to institutional outcomes. The review begins by examining rationales for diversification and empirical studies within the field of higher education. I then outline and substantiate my argument that conceptualizations of revenue diversification within the field are theoretically short-sighted and related empirical studies are underdeveloped. To supplement and refine the higher education literature, I present theories and empirical studies from the management literature. Within this second category of literature, revenue diversification as applied to the financing of non-profit organizations (NPOs) is given far more scholarly attention and, I argue, measured according to more appropriate criteria.

Because most non-profit organizations have traditionally been unable to rely on higher education's historically consistent revenue streams, scholarship within the management field has given revenue diversification more consideration. Theories and empirical studies within this field provide a valuable supplement to higher education analysis as colleges and universities (with the exception of emerging for-profit universities) and NPOs share three commonalities. First, both colleges and universities and NPOS operate in "trust markets" characterized by asymmetric information. Put another way, funders and consumers of higher education and NPOs

alike do not necessarily know what they are getting when they give or partake of services (Winston, 1992, 1997). Secondly, consumers in each sector enjoy highly-subsidized products. Students do not pay the full cost of their education just as non-profit customers rarely pay the full value of the good(s) or service(s) they receive (Winston, 1992).

Finally, both higher education institutions and NPOs are typically motivated more by idealistic goals than are normal business firms. NPOs and institutions of higher education can and do make profits; however, they are governed by non-distribution constraints and attempt to balance their institutional mission with economic realities (Hansmann, 2000).

Higher Education Literature

Within the higher education literature, two very different, yet compatible, rationales are provided for why colleges and universities should diversify their revenue portfolios. The first rationale is a principle-based equity argument while the second stems from resource dependence theory and increased financial exigency. In the following sections I examine the strengths and weaknesses of each diversification rationale as well as the recommended circumstances and strategies for diversification as outlined by their proponents. I also identify the criteria used to measure the effectiveness of a diversification strategy. By and large, studies in the higher education literature evaluate a strategy's effectiveness by measuring the consequences upon net institutional revenue and educational goals such as access and equity. These measures may or may not be the best criteria to use when analyzing revenue diversification strategies; therefore, in what follows I also examine the extent to which such criteria themselves should be rethought.

Cost sharing rationale. Johnstone (2002, 2003a, 2003b, 2005), Browning and Browning (1994), Friedman (1962, 1968), Musgrave and Musgrave (1984), and Stampen (1980) have argued that the costs of higher education should be equitably shared by key stakeholders in

proportion to the respective benefits received. Johnstone has argued that four parties should share higher education funding: governments (taxpayers), students, parents, and donors–with the largest burden falling upon taxpayers, students, and parents.

Many of the collective and individual benefits of higher education are well documented. Taxpayers benefit through the social, cultural, and economic well-being associated with increased numbers of citizens attending and completing higher education (Baum, Ma, & Payea, 2010; Lumina, 2012). Because global competition has increased the importance of the "knowledge industry" and a higher percentage of 21st century jobs require a college education, many have argued that a well-educated society is a prerequisite for maintaining a high standard of wealth (Adnett, 2006; Lumina, 2012). Nations with a poorly educated workforce, by contrast, have been shown to lack international competitiveness (Marshall & Tucker, 1993).

A global study by the Organization for Economic Co-Operation and Development (2010) found that net public returns on higher education investment–primarily in the form of increased tax revenue and reduced welfare expenditures–were, on average, almost three times the amount invested. In the United States, specifically, Leslie and Slaughter (1992) found that for each additional $1 million of taxpayer funds provided to a four-year college, on average, 53 jobs are created and $1.8 million of business spending is generated in the local economy. Paulsen (1996) found that for each one-percentage point increase in the share of a state's high school graduates who possess a college degree, the state's workforce productivity increased an average of 1.6 percent. Finally, as more citizens attend and complete college, societal benefits such as volunteer rates, voting rates, charitable giving, and health increase, while corrections and welfare expenditures decrease (Baum, Ma, & Payea, 2010; McMahon, 1997; Pascarella & Terenzini, 2005; Paulsen, 2001a).

Likewise, students and parents benefit via the economic and social status that a college degree confers (Adnett, 2006; Baum, Ma, & Payea, 2010; McPherson & Schapiro, 2000; Paulsen, 2001a; Tannock, 2006). Based on 2008 data from the U.S. Census Bureau, Baum, Ma, and Payea (2010) estimated that individuals with a Bachelor's or Master's degree have lifetime earnings that are 66 percent and 97 percent higher, respectively, than their peers who completed high school but did not enroll in college. College graduates have also been shown to face significantly lower unemployment than their less-educated peers. In 2010, at the peak of the recession, 8 percent of baccalaureate degree recipients were unemployed or underemployed. By contrast, unemployment/underemployment reached 21 percent for high school graduates and 32 percent for those who dropped out of high school (Lumina, 2012). As previously discussed, these "private" benefits of higher education have increased in recent years, both empirically and in public perception, leading many colleges and universities to stress the individual economic value of a college degree in their marketing efforts (Duderstadt & Womack, 2003).

Because taxpayers fund the largest proportion of public university revenue, cost sharing requires a shift in the higher education burden from taxpayers to students and parents. This diversification rationale is not isolated to American institutions. In the last fifteen years, China, Great Britain, Germany, and Austria have introduced public university tuition for the first time and many other countries have increased the proportion of public university revenue drawn from tuition and fees (Global University Network for Innovation, 2009; Johnstone, 2003a; Wangenge-Ouma & Cloete, 2008). Johnstone (2003a) noted, "the supplementation of higher educational revenues by non-governmental sources–primarily students and family–is one of the major recommendations from the World Bank and most other development experts as one important solution to increasingly underfunded and overcrowded universities in the developing world" (p.

358).

At its core, the cost sharing rationale argues that higher education's historical reliance upon taxpayer funding is both inefficient and unjust. Regarding efficiency, the cost sharing rationale builds upon human capital theory (Becker, 1993; Kiker, 1971; Schultz, 1961), which essentially argues that rational individuals will pursue higher education if the personal benefits (e.g., increased future earnings) exceed the associated costs (e.g., tuition, fees, and the opportunity cost of foregone employment) (Johnes, 1993; Mincer, 1993). Although low-tuition or tuition-free public higher education is supported by all taxpayers, a disproportionate number of those who personally benefit from public subsidies to higher education are from middle, upper-middle, and high income families who could and would pay higher tuition and fee charges (Arai, 1998; Hearn, 2001; Johnstone, 2002; Kane, 1999; Leslie & Brinkman, 1987; McPherson & Schapiro, 1991; Mumper, 1996; Paulsen, 2001a). In other words, because higher education yields positive individual returns, affluent families will continue to send their children to college despite reasonable increases in tuition and fees; therefore, public subsidies to higher education represent an inefficient use of taxpayer dollars (Hearn & Longanecker, 1985; Hoenack, 1982).

Furthermore, cost sharing proponents note that the taxes (including state sales taxes) that support the higher education subsidy are generally regressive and place the heaviest burden upon the lowest economic class. Therefore, public subsidies to higher education serve as a transfer payment from the poor to middle and high income families (Bloustein, 1990; Hoenack, 1971; Stampen, 1980; Wallace, 1993).

A more equitable scenario, cost sharing proponents have argued, would involve a high-tuition model in which all students are charged a greater proportion of their educational costs. A share of collected funds could then be targeted to students with demonstrated financial need

(Breneman, Doti, & Lapovski, 2001; Fisher, 1990; McPherson, 1978; Wangenge-Ouma & Cloete, 2008; Zumeta, 2001). By adjusting student price for different income groups, tuition rationalization could remove or at least reduce between-group inequalities. As Leslie and Brinkman (1987) put it, "Expanding and equalizing student access has long been a major public policy goal, and manipulation of price has been seen as the major policy instrument for achieving this goal" (p. 182). In theory, this approach matches educational costs against individual and collective benefits while at the same time accounting for variations in student need. Proponents argue that this model results in a win-win scenario as taxpayer burden is reduced, the institution collects more net revenue, and access opportunities for low-income students are improved.

A critical assumption embedded in this diversification rationale is that financial aid serves as a perfect substitute for low tuition in the educational decision-making of students with low socioeconomic status (low-SES) (Hearn & Longanecker, 1985). Said another way, cost sharing holds that the educational decisions of low-SES students will not be affected by a $1,000 increase in tuition if offset by an equivalent $1,000 increase in financial aid. Empirical studies testing this assumption, however, are quite contested. Manski and Wise (1983) found that the impact of changes in financial aid and tuition were statistically similar. In support of a high-tuition model, St. John (1990) found that students in the lowest income quartile were, in fact, more than twice as sensitive to increases in grant aid as they were to decreases in tuition. Using data from the 1980 High School and Beyond survey, St. John found that a $100 increase (in 1982 dollars) in grant aid increased the probability of enrollment for the lowest SES students by 0.88 percent, while a $100 tuition decrease only increased the probability of enrollment by 0.34 percent. McPherson and Schapiro (1989), however, found that low-income students were more sensitive to changes in tuition than they were to changes in financial aid. The authors used the

Current Population Survey (CPS) data from 1974 to 1984 to determine that a $100 tuition increase (in 1984 dollars) resulted in a 0.68 percent decrease in enrollment for low-SES students. The same low-SES students, however, had no statistically significant reaction to an equivalent decline in grant aid. Additional studies on the effects of tuition/financial aid changes will be discussed in the following section.

Finally, the cost sharing rationale argues that society and the entire higher education system will benefit from a more diversified revenue structure. Proponents argue that where government funding has given the flagship state university a perceived monopoly on high-prestige higher education, there has been little incentive to provide a quality education as desired by the student. Under cost sharing, the average student and/or parent who pays a greater share of educational costs becomes a more discerning consumer and demands quality instruction. Colleges and universities are then forced to be more responsive to individual and societal needs. Additionally, under cost sharing, "career students" who are paying little or nothing to remain in privileged student status for an extended period of time will be given incentives to graduate. As they enter the workforce, the economy will benefit from their productivity and usefulness.

The cost sharing rationale has faced strong opposition, however. In many countries, including the United States, higher education is seen as a social entitlement. The belief that students and parents should contribute to the costs of higher education is not a given. Johnstone (2002) argued that "any policy that seeks to impose a new or a sharp increase in the price of a good or service that has come to be viewed as an entitlement, especially one so seemingly noble and socially important as higher education, will be fiercely contested" (p. 27). Recent tuition and fee increases have already resulted in heated protests (Wollan & Lewin, 2009). Cost sharing will inevitably lead to ideological and political conflicts, including disagreements regarding the

means used to calculate which benefits are public and which are private (Behrman, 1997; Pechman, 1970; Rowley & Hurtado, 2003; Stampen, 1980). Rowley and Hurtado (2003) argued that "some benefits that accrue to individuals in the private realm can quite often serve as factors in the realization of certain public benefits" (p. 216).

Additionally, some have opposed the efficiency and market responsiveness arguments embedded in the cost sharing rationale. These traditionalists have argued that higher education should be insulated from commercialization and market forces (Duderstadt & Womack, 2003; Kezar, 2004). It is argued that slavishly catering to what students think they want leads to a focus on competitiveness, while the traditional values of truth and equity at the center of higher education are abandoned. Corporate approaches to higher education, it is argued, result in "less informed governance decisions, decreased commitment and motivation from staff, and the further degradation of teaching and learning environments" (Kezar, 2004, p. 445). The final and perhaps most significant weakness of this rationale regards its unintended consequences for minority and low-SES students, which are discussed in the following section.

Because this rationale primarily compares the benefits for individual students or families with those of the collective taxpayers, it has limited applicability for private colleges and universities where governmental appropriations play little to no role. Additionally, donors and institutional entrepreneurship are frequently cited as parties responsible for a portion of higher education funding. However, cost sharing proponents do not explicitly detail the benefits received by these parties or the proportion of revenue that they should fund. It is implicitly assumed that the smallest burden should fall to these parties. Because the literature focuses so heavily upon the costs and benefits attributable to taxpayers, students, and parents, the following section examines various strategies primarily in light of their effects upon those three part

Cost sharing circumstances and strategies. While there is no consensus within the literature regarding the means to quantify the entirety of private benefits against public benefits, cost sharing argues that revenue diversification should be pursued when the various benefits received from higher education are not properly aligned with the costs paid by the respective beneficiaries. Because cost sharing regards a larger share of higher education's benefits to be individual rather than collective, institutions should diversify their revenue by increasing the share contributed by students and parents at least until revenue from tuition and fees exceed those from taxpayer monies (Griswold & Marine, 1996; Johnstone 2002, 2003a). As discussed in Chapter One, average tuition at public masters and research universities exceeded state appropriations for the first time in 2010. Diversification via cost sharing can occur through a number of strategies, including:

- initiating tuition where higher education was initially free (a practice seen most recently in Europe),
- raising tuition across the institution,
- increasing tuition for specific high-cost programs or majors,
- reducing grants and scholarships,
- increasing the effective cost recovery on student loans,
- increasing user fees on subsidized amenities like residence and dining halls, and/or
- forcing students into the unsubsidized private sector by limiting enrollment in the subsidized public sector (Adnett, 2006; Johnstone, 2003b; Marcucci, Johnstone, & Ngolovoi, 2008; Shin & Milton, 2008).

It is often overlooked that increasing tuition is itself a revenue diversification strategy and the most prevalent strategy of the past quarter century. Numerous studies have examined the

consequences of tuition increases and other cost sharing strategies upon net institutional revenue, as well as upon educational opportunity and quality. The following two sections examine the effectiveness of these strategies using those criteria.

***Tuition increases*.** Two relatively uncontested benefits of tuition increases are identified within the literature. First, tuition increases augment increasingly scarce public resources. Even without calls to match benefits with financial sacrifices, tuition increases may prove to be a short-term necessity due to the economic conditions previously discussed (AAUP, 2012; Archibald & Feldman, 2006; SHEEO, 2013). As state appropriations, charitable giving, and endowment income decline, tuition increases can be used to sustain short-term institutional budgets. Second, tuition increases have the benefit of increasing institutional funds without simultaneously adding new costs or diverting faculty from their core responsibilities. Other diversification strategies, as will be discussed, run into challenges on this latter point.

Although tuition increases have prevailed in recent years, a number of studies have challenged their efficacy for promoting an ideal higher education system. Many scholars have argued that tuition increases have unintended long-term consequences (Hearn & Longanecker, 1985). In accordance with demand theory, virtually all studies on the matter have found an inverse relationship between tuition and student enrollment (Heller, 1996, 1999; Hsing & Chang, 1996; Kane, 1994, 1995; Leslie & Brinkman, 1987; Paulsen & St. John, 1997; St. John, 1990). Using IPEDS data and a combination of cross-sectional and time-series analysis, Heller (1999) found that a $1,000 tuition increase (using 1994 dollars) reduced *total* enrollment in community colleges and comprehensive universities by 2.1 percent and 0.5 percent, respectively. Students at community colleges have consistently been shown to be the most responsive to tuition charges (Leslie & Brinkman, 1987; Heller, 1997). An interesting finding within student demand studies

was identified by Leslie and Brinkman (1987). In their review of over 30 studies, the authors concluded that a tuition reduction consistently has a greater positive enrollment effect than the negative effect of a tuition increase. Such a finding challenges the rational actor assumption at the heart of the cost sharing rationale.

Challenging the research of high-tuition model proponents, a number of scholars have suggested that high tuition, even when supported by high levels of financial aid, harms low-income and minority students by hampering the ability of higher education to serve as a vehicle for social mobility. As put forth by numerous behavioral economic studies, underrepresented students and their families may not understand that high tuition can be offset by various forms of financial aid (Avery & Kane, 2004; Collison, 1988; Dynarski & Scott-Clayton, 2006; Hearn, 2001; Heller, 1997; Kane, 1999; McPherson & Schapiro, 1989; Mumper, 1996; Olson & Rosenfeld, 1984; Post, 1990). Writing about the complexity of the financial aid process, Kane (1999) argued, "We have built a system so complicated that it nearly requires a college degree simply to understand the full range of subsidies available" (p. 152).

Because costs are perceived to be prohibitive, underrepresented students may not aspire to a university education during their secondary education years, which puts them at a significant disadvantage to their college-ready peers. While recent studies have shown that the difference is declining, empirical work has often shown that students are more sensitive to tuition changes than equivalent changes in financial aid (Heller, 1997; Leslie & Brinkman, 1987). The research supports the argument that underrepresented students are more effectively served by low tuition than by the ability of institutional and governmental programs to administer need-based aid. Even with higher need-based aid, further increases in tuition and fees, it is argued, will result in lower enrollment of underrepresented students. Because higher education serves as the

gatekeeper to many positions of higher earnings and status, larger achievement and income disparities across both race and SES may result from additional tuition increases.

Others have argued that the tuition elasticity of middle-class students has been underestimated by proponents of the high-tuition model (Johnson & Leslie, 1976; Kohn, Manski, & Mundel, 1976; Savoca, 1990; Tierney, 1980). At current prices, higher education places a relatively heavy burden on the average student and family. St. John (1990) found that while low-SES students are most sensitive to grant aid, tuition elasticity for the second and third quartiles of American students are on par with those of the lowest quartile. Other studies have challenged the human capital theory upon which cost sharing is based by showing that when making college decisions, students of all economic classes are considerably more responsive to changes in the costs of higher education than they are to changes in the benefits received (Kane, 1999; Leslie & Brinkman, 1988). Increases in tuition costs, then, may negatively affect the enrollment and persistence of a majority of American students even if outpaced by increases in personal benefits. In such a scenario, the disproportionate loss of enrollment would also lower total institutional revenue (Cheslock & Gianneshi, 2008; Corey, 2007; Jaschik, 2005).

The high-tuition, high-aid model has also come under scrutiny by those who argue that equity is unlikely to be increased due to the difficulty of need assessment. The growing number of single-parent homes, the higher number of noncustodial parents, and the increasing variation between what parents are willing to pay in support of their children (one's *expected family contribution*) have made it very difficult to estimate the true financial need of a student. Without some equitable and verifiable way of assessing student need, either tuition must be kept low for all students or a large segment of the population will effectively be denied access.

Perhaps the biggest flaw in this strategy is that high tuition does not in itself guarantee

high aid (Mingle, 1992; Mumper, 1996, 2001; Paulsen, 2001b). As states continue struggling to balance their budgets, opponents of tuition increases rightly argue that need-based aid–initially promised when tuition was raised–is likely to decline in subsequent years (Mingle, 1992; SHEEO, 2013). In comparison to general subsidies that provide low tuition for all, financial aid to individual students may prove to be significantly easier to reduce in budget deliberations because targeted subsidies "seem to aid groups with less political clout at the expense of those with more power and who are more likely to vote" (Griswold & Marine, 1996, p. 384). Paulsen (2001b) found that:

> Out of the many states that have raised tuition…most such increases have not been accompanied by offsetting grants to high-need, low-income students; which means that a high-tuition, low-aid scenario has too often been the unintended outcome–an outcome that threatens both efficiency and equity regarding resource allocation and access to higher education. (p. 126)

The state of Vermont, the earliest adopter and expounder of the high-tuition, high-aid model, saw public tuition increases significantly outpace increases in need-based aid in the 1980s and 1990s (Lenth, 1993; McCarthy, 1996; Mumper, 2001). A qualitative case study by Griswold and Marine (1996) found that even states, such as Minnesota and Washington, that have legislatively linked tuition and financial aid policies have found that their efforts to promote equity and access are frequently corrupted by political and economic influences. Although the field has not produced a nationally-representative empirical study that has tested whether public tuition increases lead to later cuts in appropriations, many argue that higher education funding will fall even further down the priority list for state funding should administrators diversify through additional tuition increases. If this were indeed the case, this strategy would likely have significant consequences upon both total institutional revenue and student access (Griswold & Marine, 1996; Hearn & Longanecker, 1985).

Finally, critics argue that an erosion of the status and quality of public higher education is the likely result of further tuition increases. As the cost subsidy to the middle- and upper-class student is reduced, public institutions lose their only competitive advantage over their private counterparts. With no price advantage left in the public sector, private institutions with large endowments, wealthy alumni, and a tradition of philanthropy will draw the majority of well-prepared students (Duderstadt & Womack, 2003). Public institutions, it is argued, will become primarily fallback options for students not accepted by private institutions and educational quality will decline concomitantly.

Colleges may be able to limit the consequences of this strategy by using a more sophisticated pricing model to selectively raise tuition by major or academic program. For decades, colleges and universities have charged different rates of tuition to students based on level (undergraduate vs. graduate). In a recent article in *Higher Education*, Shin and Milton (2008) argued that a more efficient and equitable pricing model would result if colleges and universities took this practice one step further and charged tuition based upon some combination of actual expenditures incurred and expected future earnings. In accordance with the benefits-received principle, the authors argue that an academic major requiring costly laboratories, technology, or field experiences should be charged more tuition than one that does not. The Discipline Cost Index (DCI) developed by Smith (1992) suggested that the costs for engineering and science disciplines were the highest while those for mathematics, the social sciences, and business were the lowest. With advanced budgeting systems in place at most colleges and universities, it is likely that the majority of institutions can obtain this specific information.

Furthermore, student elasticity for certain majors may be tempered by higher expected future earnings. Shin and Milton's study suggested that this was, in fact, the case. Using data

from 470 public institutions, the authors examined tuition elasticity across six majors. Biology, physics, and business majors were shown to be highly sensitive to tuition increases, while engineering, math, and education majors were not. As would be expected by human capital theory, students in engineering–the field with the highest expected future earnings–showed the lowest enrollment response to tuition changes. Although institution-specific studies would be needed before implementing such a policy, this research suggests that isolated tuition increases for certain majors or academic programs may allow institutions to diversify their revenue through cost sharing while at the same time sustaining access and equity. If properly justified by the associated educational costs, program-specific tuition increases may be more politically acceptable than institution-wide increases.

Although not addressed in Shin and Milton's work, online students may be less sensitive to tuition increases than their in-residence counterparts. The convenience of online education may allow institutions to charge a higher rate of tuition without the enrollment and access problems detailed above. Because many of these students are working adults with full-time incomes, the convenience of online delivery (e.g., lack of transportation costs, flexibility to maintain full-time employment) may reduce the sensitivity of these students to tuition increases (Collis, 2002). Although some institutions have begun charging differing rates for on-campus versus on-line courses (Allen & Seaman, 2010), empirical studies within the field have yet to show that tuition elasticity differs within the respective student populations. Finally, a few colleges including the University of Oregon have experimented with varying tuition charges according to when instruction takes place. It is argued that an institution may increase total revenue, yet maintain access, by charging higher rates during high demand times, while keeping tuition rates low for classes offered in the late afternoon or evenings, on Fridays or weekends.

The effects of such pricing policies on total institutional revenue or student access have yet to be studied.

***Other cost sharing strategies*.** While many of the remaining cost sharing strategies are likely to yield similar results when compared to tuition increases, others may not. The prevalence of empirical studies on the remaining cost sharing strategies is mixed. A reduction in grants and scholarships, whether need-based or non-need-based (the latter of which includes but is not limited to merit-based aid) and whether at the governmental or institutional level, has widely been shown to create similar consequences as those of tuition increases. Student enrollment is promoted through increases in financial aid and reduced through cuts, with the strongest effect upon low-SES and minority students (Heller, 1997; Leslie & Brinkman, 1987, 1988; Moore, Stueenmund, & Slobko, 1991; St. John, 1990, 1991; St. John & Noell, 1989). Compiling the results of numerous financial aid studies, Leslie and Brinkman (1988) estimated that grants and scholarships were responsible for providing access for sixteen percent of all students enrolled in higher education at that time.

Financial aid has consistently been shown to aid underrepresented students in gaining access to the higher education system. St. John (1990) found that although a $100 increase in grant aid (using 1982 dollars) increased enrollment for the students in the second and third income quartiles by 0.35 and 0.33 percent, respectively, the same increase was responsible for a 0.88 percent increase in enrollment for students of the lowest quartile. Likewise, St. John and Noell (1989) found that grants of any size had a significantly greater effect on enrollment probabilities for Black and Hispanic students than for White students. Blacks receiving grant aid were 17.7 percent more likely to enroll, Hispanics 14.1 percent more likely, and Whites 8.9 percent more likely. The recent policy shift away from grants and toward loans, as well as the

shift from need-based aid to non-need-based aid, has also been shown to disadvantage the access opportunities and persistence of low-income and minority students (Cabrera, Terenzini, & Bernal, 2000; Chen & DesJardins, 2008; Hearn, 2001; Heller, 1997; Newman, 1985).

The aforementioned studies suggest that investment decisions in higher education are rarely made by truly rational actors possessing perfect information regarding the net personal benefits received–a key assumption of the cost sharing diversification strategies. Facing increased tuition and reduced financial aid, human capital theory argues that students will simply take out loans to meet their required educational costs. However, recent research has shown that underrepresented students are both culturally averse and more sensitive to student loans (Cabrera, Terenzini, & Bernal, 2000; Hearn, 2001; Heller, 1997). Such effects are exacerbated by the strategy of increasing the effective cost recovery on student loans. Governments can increase cost recovery, thereby shifting a larger portion of costs to students and parents, either by eliminating the interest-rate discount and charging a full market-rate of interest or by eliminating interest deferral while a student is enrolled and beginning interest accrual immediately upon loan origination (Thomson, 2008). Although no empirical studies have quantified the enrollment effects of this strategy, it is intuitive that such policy changes may persuade many students on the margins of the higher education system that college attendance is too costly. Because low-income and minority students are often the most in need of loan funding, this strategy is likely to increase enrollment and achievement gaps by income and race.

No studies have empirically examined the consequences of increasing housing or boarding costs (typically classified as "auxiliary" revenue), or purposefully limiting enrollment in the public sector. For students without the option to live at home, increased room and board costs are likely to have similar consequences to those of tuition increases. Room and board

increases have not been as heavily documented, nor politically contested, so the prevalence of this strategy is difficult to ascertain. Reducing enrollments via more stringent admissions criteria dramatically reduces the access of low-income and minority students who disproportionately score lower on many standardized metrics used to grant admission. Such a strategy shifts American higher education away from an open-access system and towards an elite or merit-based system of the past. It violates the very purpose of higher education as a means of social mobility and denies the role of higher education as a public good. There is no guarantee that displaced students will enroll in more expensive private colleges and universities or that these institutions will develop the necessary capacity to serve students that are crowded out by the shrinking public sector. Enrollment, retention, and degree completion will likely be reduced, particularly within student demographics that are already underrepresented in the current system.

Diversification to reduce dependence and risk. A second, and less ideologically contested, rationale for diversification is drawn from resource dependence theory. A number of higher education scholars have argued that diversifying a college or university's economic base is sound financial policy for all economic and political environments (Breneman, 2002; Clark, 2002; Ehrenberg, 2000; Hearn, 2003; McPherson, 1999; Winston, 1997). Whether publicly- or privately-controlled, colleges and universities put themselves in vulnerable positions of dependence when they rely on a small number of funding sources. External organizations may exercise undue influence over the institution, challenging its mission and values (Zeiss, 2003). By utilizing multiple sources of revenue, effective diversification strategies place a college or university in a more favorable position whereby it is less dependent upon any single source.

Additionally, when funding is heavily concentrated in a limited number of sources, a decline in revenue from one source is likely to lead to a significant budget shortfall. When

revenue is drawn instead in a balanced proportion from multiple streams that lack a tight positive relationship, a decline in funding from one source may be offset by an increase from another. In the latter scenario, actual revenue is kept close to the amount of anticipated revenue and total risk to the institution is reduced (Markowitz, 1952). Johnstone (2002) argued that "the financial viability of higher education…depends in large part on the ability of higher education to diversify its revenue base" (p. 34). Because funding sources have become more uncertain in recent years (again, see Appendix A), the literature has argued that the need for revenue diversification has never been higher.

Well-publicized entrepreneurial successes at elite universities have heightened interest in revenue diversification through commercial activity (Hearn, 2003; McPherson, 1999; Newman & Courturier, 2001; Winston, 1997). McPherson (1999) suggested that 21st century colleges and universities should hold a "double vision," keeping one eye on the market looking for opportunities to grow and diversify revenue and the other eye on the lofty goals of the academy. The most powerful and effective institutions, McPherson argued, are those that effectively reconcile the long-perceived conflict between business principles and university ideals by taking advantage of diversification strategies that grow revenue while also enhancing institutional values. In austere conditions, institutions may justifiably be forced to diversify their revenue using auxiliary sources that have little to no educational benefit but simply help the institution survive. Activities that threaten core, cherished academic values, however, are most troubling and should be rejected.

In a similar spirit, Bowen (1980) observed that higher education administrators continually seek funding because colleges and universities operate under a revenue theory of cost. New revenue should always be sought because there is no limit to what colleges and

universities may spend in the pursuit of excellence, prestige, and influence. In this pursuit, colleges and universities tend to raise and spend all the money that they can. Although diversification to reduce dependence and risk appears to be generally accepted within the literature, an extensive search revealed no empirical study showing that colleges and universities with highly diversified revenue achieved financial or educational goals more frequently than their less diversified peers. It is this gap that the present study seeks to fill.

The argument against revenue diversification to reduce dependence and risk primarily comes from traditionalists who hold that higher education is a unique, economically inelastic institution and that wider engagement with the market will have a negative effect on its mission (Bok, 2003; Brightman, 1989; Campbell & Slaughter, 1999; Collis, 2002; Etzkowitz, Webster, & Healey, 1998; Slaughter & Leslie, 1997). Bok (2003) cautioned that "something of irreplaceable value may get lost in the relentless growth of commercialization" (p. 17). If institutions of higher education were to "sell out" or "prostitute themselves" in pursuit of new revenue, they might be in danger of losing their souls (Neely, 1999; Wertz, 1997). Newman (2000) warned:

> As higher education becomes more closely linked to for-profit activities and market forces, its special status is endangered. With growing emphasis on revenue streams, introduction of for-profit activities…and other trappings of the corporate world, there is new danger that the public and its political leaders will view higher education as just another interest or industry devoid of attributes that raise its interests above those of the marketplace throng. (p. 17)

However, increasing financial austerity as well as the divergence between funds available from traditional sources and the rising costs of higher education has made such a position untenable. McPherson (1999) summarized the prevailing counter-argument:

> A single-minded determination to preserve educational purity and sever our connection to practical demands would leave us not only with greatly diminished resources, but with a greatly diminished voice in society and little basis beyond

> our own self-certainty for confidence in the effectiveness and value of what we do. (p. 27)

The more difficult issues found in the literature are thus not whether to diversify institutional revenue, but rather when and more so how. It is to the circumstances and strategies for diversification as outlined in the higher education literature that I now turn.

Dependence/risk-reduction circumstances and strategies. Building on resource dependence theory, the second rationale for diversification argues that colleges and universities should diversify when reliance upon any one revenue stream becomes too high. The literature does not specify how to measure this tipping point, but notes, rather, that it may vary by institution. Colleges and universities should also diversify when a major revenue source significantly declines or is projected to decline, as is the present case with state appropriations (Hearn, 2003; Zeiss, 2003). The higher education literature examining diversification strategies is quite sparse with the exception of studies examining tuition increases (previously discussed). I examine various diversification strategies below, dividing them into those that lack empirical testing, and those–such as increasing external research funding and philanthropy–that have seen some empirical testing.

***Untested strategies*.** Although no empirical research has assessed the following strategies, they have been presented as innovative ideas that forward-thinking administrators should learn from and consider. The ultimate success of these strategies relies on a multitude of factors including the tangible and intangible resources available to support the diversification strategy, the planning and administration of the initiative, and external market conditions. While some colleges and universities have adopted these strategies through careful consideration of their effects on other revenue sources, the additional costs involved, and institutional goals, others have approached them as last-ditch survival efforts.

These strategies can be divided into two categories: those which utilize traditional resources already at the disposal of the institution and those which enter new, non-traditional markets requiring new capabilities and significant organizational change. Regarding the former, colleges and universities have attempted to develop new academic programs, including high demand Master's programs, online education, corporate training, and continuing professional education (Allen & Seaman, 2010; Collis, 2002; Grayson, 2003; McDaniel & Epp, 1995; Schneider, 1999); grow revenue through expanding university athletics and sports facilities (Allen, 2002); and more effectively utilize land and facilities during off-peak times for conferences, concerts, and summer camps (Biddison & Hier, 1998; Brightman, 1989; Grayson, 2003; Kelderman, 2009; Kienle, 1997; Scott, 2005; Wills, 2005).

Regarding the latter, the number of relationships between the academy and the market continues to increase as administrators look for promising, non-traditional revenue opportunities. While some diversification strategies have been successful in yielding greater net revenue and furthering institutional mission, others have failed on both fronts. Institutions have attempted to diversify their revenue through developing technology patents and licensing, leading to ongoing royalty income (Blumentstyk, 2004; Phillips, Morell, & Chronister, 1996; Thursby & Thursby, 2002), engaging in corporate business partnerships in a wide variety of industries (Campbell & Slaughter, 1999; de Zilwa, 2005; Zeiss, 2003), licensing campus bookstores and restaurants for a portion of fees collected (Blumenstyk, 2003; Keppler, 2010; Milshtein, 2002; Stack, 1987; Wertz, 1997), providing insurance and banking services (Grayson, 2003; Leder, 2002), and placing revenue-generating ads on the institution's website(s) (Carnevale, 2003). No higher education researcher has yet to standardize the inputs and outputs of these strategies in order to facilitate empirical testing for their effectiveness. Without a consideration of the state context as

well as the individual characteristics and needs of a particular institution, the aforementioned strategies can only serve as ideas to promote discussion at the institution level.

***External research funding*.** While revenue from the federal government has remained a relatively stable component of total revenue at many private research universities, public research universities have seen this source increase in recent years. Connolly (1997) found that research institutions may be able to increase research funding from the federal government and other external sources by investing greater amounts internally. Connolly analyzed 12 years (1979–1990) of expenditure data for 195 research universities from the National Science Foundation. Descriptive statistics revealed that external funds comprised 81 percent of total research funding for these institutions in 1990, the last year examined. The federal government provided 75 percent of those external funds, or 61 percent of total research funding.

Connolly found that an increase in the funds designated for research from either internal or external sources enhanced the amount provided by the other for several years after the original designation was made. Funds that are internally budgeted explicitly for research may be seen as an indication that the institution has a strong commitment to research. Furthermore, the quality of research may improve with additional internal support, thereby inducing external agencies to supplement the funding. The evidence suggests that federal agencies desiring to allocate funds to the most productive universities provide greater levels of support to institutions that have first invested in their own work.

As state appropriations decline, diversification through external research funding may then be a prudent long-term strategy for the nation's largest research universities. While front-end costs may prohibit many colleges and universities from developing competitive research capabilities, the data suggest that both internal and external funding of research generate a

multiplier effect that continues in later years, i.e. a *Matthew effect*. As the saying goes, the rich get richer. Likewise, institutions should strive to maintain current levels of external and internal research funding during difficult economic conditions, as a cut in research funding was shown to have a negative funding impact in subsequent years.

Increasing research funding may also aid institutional fundraising for the largest research universities. In a fixed effects study of 577 institutions, Payne (2001) used 26 years of panel data to examine the relationship between federal research funding and private giving. Prior research on non-profit sector firms has shown that public and private funding often act as substitutes, particularly when donors give out of altruistic motivations. Said another way, donors are likely to forego or reduce charitable giving if an institution receives adequate funds from another source. Payne found that this was the case, but only for certain types of institutions. For liberal arts colleges and Master's universities, a one-dollar increase in federal research funding resulted in private giving decreases of 45 cents and 9 cents, respectively. Donors may perceive the receipt of federal funds to signify an undesirable shift in mission away from teaching and service. Alternatively, they may perceive that federal funding is an adequate substitute to cover the most urgent needs of the institution, thereby reducing the necessity of their giving.

However, donor motivation appears to differ by institutional type. Payne's study found that for research universities, federal research funding does not crowd out donations, but actually draws them in. For the 196 research universities examined, Payne found that federal research funding was positively correlated with private giving. A one-dollar increase in federal research funding increased giving at these institutions by 65 cents. The relationship was significant and positive for both public and private research universities. For donors who are interested in maximizing the utility of their donations, federal funding may serve as a signal of high quality

and prestige, offsetting the substitution effect in the minds and pocketbooks of donors.

Collectively, these studies suggest that research universities may use their own internal investment in research to develop greater total revenue. Internal investment in research increases federal research funding which increases private giving. Some limitations should be noted. First, as more universities adopt this diversification strategy and the competition for research funding increases, the funding relationship with the federal government and/or private donors may change. Second, no study has examined the relationship between federal funding and state appropriations (historically, the largest source of revenue for public institutions). It is possible that gains from federal research funding may be more than offset by losses in future state appropriations, putting institutions in a more diversified but less beneficial position. Finally, as more faculty members focus on research, teaching and service may be negatively affected, with related consequences for student learning, retention, and degree completion. These potential consequences represent an area of further inquiry.

Philanthropy. Except for a few institutions like the University of Michigan, Cornell, and Indiana University, fundraising programs in public higher education did not appear until the 1970s (Cook & Lasher, 1996). While voluntary giving has always been a significant part of private higher education, philanthropy has taken on increasing importance for public institutions as state support has declined. Diversifying institutional revenue to include a larger share of voluntary support is conceived to be beneficial because unlike some other revenue sources, the cost of raising private gifts is typically exceeded by the dollars raised (Rooney, 1999).

A small number of empirical studies have examined whether, and at what point, diversification through voluntary giving may be a prudent strategy. Cheslock and Gianneschi (2008) used panel data of all public four-year colleges and universities for 11 years (1994–2004)

to examine the relationship between state appropriations and private giving per FTE student. Controlling for factors such as unemployment and income, Cheslock and Gianneschi found a positive relationship between state appropriations and voluntary giving to higher education. A $1,000 decrease in state appropriations resulted in a decrease of $48 in private giving. A similar relationship held when one, two, or three year lags were introduced between initial year appropriations and later giving. In other words, colleges and universities do not offset poor state funding with more private gifts. State funding appears not to crowd out giving but rather to crowd them in. At first glance, then, diversification through philanthropy would be an unwise strategy when state funds decline.

Although not tested in their analysis, Cheslock and Gianneshi hypothesized that the relationship between state appropriations and donor giving depends heavily on donor motivations. Some individual donors desire a particular institution to have a certain level of resources. These donors tend to perceive public appropriations as an adequate substitute resulting in a negative relationship between the two sources. As state appropriations decline, these donors will often fill the funding gap. Studies by Taylor and Martin (1995), Miracle (1977), and House (1987) confirm that individual higher education donors are more likely to give when they perceive that the institution needs financial support.

A second class of donors may be unaffected by the level of state appropriations. For donors interested in providing restricted funds toward a certain activity or program that would not otherwise be funded (e.g., scholarship funds for specific classes of underrepresented students), a change in state appropriations may have little to no effect. Not all higher education donors are as altruistic, however. Some donate to higher education in order to gain a direct personal benefit (e.g., prestige, athletic event tickets, etc.). Others seek the institution that can

best perform the activity of interest and are attracted to institutions already possessing significant resources. Gifts from these latter two classes of donors are likely to have a positive relationship to state appropriations (Baade & Sundberg, 1996; Cook & Lasher, 1996; Cunningham & Cochi-Ficano, 2002; Leslie & Ramey, 1988). Declines in state appropriations may lead to a perceived decline in status and quality, leading these two classes of donors to redirect their funds. Restricted gifts and capital gifts, which are typically given by these latter two types of donors, had the strongest positive relationship with state appropriations (Cheslock & Gianneschi, 2008).

Earlier research conducted by Leslie and Ramey (1988) explored the relationship between various donors and state appropriations. In their analysis of data from 73 Research-I universities, gifts from individuals (both alumni and non-alumni) were found to have the strongest negative relationship to state funds. An increase of 1 percent in state funding lowered individual contributions by 0.40 percent. This research suggests that individuals tend to see state funds as a substitute. Individuals were also less likely to reduce giving on account of economic conditions. Cheslock and Gianneschi (2008) found a negative but statistically insignificant relationship between state appropriations and alumni giving. Corporate gifts, however, were found to have a statistically significant positive relationship to state appropriations (Cheslock & Gianneschi, 2008; Leslie & Ramey, 1988). While foundations and corporations were shown to react primarily in a rational economic way in order to maximize the benefits received and/or effectiveness of their giving, individual giving has a more significant human element. Colleges and universities should thus selectively emphasize specific institutional traits to various donor groups in order to increase the probability and amount of donor support. Demonstrating critical financial need as state appropriations decline is likely to be a productive strategy in gathering alumni support.

A key finding from the Cheslock and Gianneschi study (2008) was that private giving is considerably less distributed and equitable than are state appropriations. For the 11-year period examined, the institution at the 90th percentile received 1.7 times the appropriations per FTE student as the median institution; and the institution at the 10th percentile received 69 percent of the median institution's appropriations. There was much more disparity regarding voluntary giving, with the institution at the 90th percentile receiving 5.2 times the amount of donations per FTE student compared to the median institution; and the institution at the 10th percentile receiving only 30 percent of the amount received by the median institution.

The authors found that institutional selectivity was significantly responsible for determining where colleges and universities fell within this range. A Matthew effect is clearly evident when private giving is analyzed by institution. Gifts from foundations were shown to be much more unequally distributed than were gifts from alumni and corporations. The authors argue that "to the extent that certain public universities have stronger student demand, wealthier alumni, or a better research infrastructure than other public institutions, these schools will be able to generate greater revenue from alternative sources" (Cheslock & Gianneschi, 2008, p. 209). A widespread diversification whereby state appropriations are replaced by private giving is, therefore, likely to lead to increased resource inequality across institutions. Because the highest numbers of underrepresented students attend less elite institutions, diversification through voluntary giving may have a dramatic effect upon student access and the aforementioned achievement gaps.

Cheslock and Gianneschi appropriately recognized that a reciprocal causal relationship may exist between giving as an independent variable and state appropriations as the dependent variable. As institutions receive more private gifts, state legislators may redirect tax revenue to

more pressing needs. Alternatively, legislators may reward institutions for meeting fundraising goals through a matching program. The causal relationship here could be addressed in a future paper using the same dataset. A number of other key relationships remained unexamined in these studies as well. No study examined the relationship between tuition increases and voluntary giving or whether the level of institution effort (i.e., dollars spent in fundraising efforts) varied with changes in state appropriations.

Ultimately, the success of this strategy is affected by numerous factors that are uncontrollable by higher education institutions. While the full range of factors that promote donations to higher education is beyond the scope of this review, these factors include the tax deductibility of donations, both past and anticipated economic growth, the uneven distribution of wealth, and a culture of giving (Johnstone, 2005; Leslie & Ramey, 1988).

Summary. Recent initiatives led by the federal government and independent foundations have stressed the importance of higher education and degree completion to American public policy. Although the percentage of American adults between the ages of 25 and 64 who hold a two- or four-year degree is just 38 percent, the Lumina Foundation for Education (2012) has called for the United States to increase this percentage to 60 percent by 2025. The Obama administration has also heavily emphasized higher education and set as a goal that America once again have the highest proportion of college graduates in the world by 2020. Although appealing in theory, tuition increases and most other cost sharing strategies have significant drawbacks including negative consequences for underrepresented students, a reduction in the relative quality of the public higher education sector, and acceleration of the decline in government support. Despite arguments that the individual benefits of higher education have increased, cost shifting strategies are likely to limit degree completion, particularly for underrepresented students.

However, a more sophisticated model assessing tuition based on a combination of program delivery costs and tuition elasticity by program/major has shown to be effective for increasing total revenue while maintaining access. Nonetheless, administrators should be careful to gather institution-specific data about costs and price response before implementing such a policy.

Investment in research was shown as an effective strategy for institutions already possessing established research programs. External funding–from both the federal government and voluntary giving–is increased when internal funds are directed to research. Additional revenue is generated both in the given year and subsequent years. The strategy was ineffective for non-research institutions such as liberal arts colleges and Master's universities, where the institutional mission focuses on teaching, not research. Directing internal funds to research was shown to reduce giving and net revenue at these institutions.

Finally, studies examining diversification through voluntary support in a time of declining state appropriations suggest that effectiveness varies depending on donor type and motivation. Individuals, particularly alumni, were shown to increase giving when appropriations declined, while corporations and foundations reduce giving in response to the same declines. Decreasing reliance upon state appropriations by increasing the share of voluntary giving may thus be a challenging strategy. Institutions may be able to target individual giving, but the quantity and size of these gifts are subject to economic factors and may be offset by declines in corporate and foundation giving. If institutions can demonstrate strength and quality despite the loss of state funding, corporations and foundations may continue to give at high levels and the strategy may prove more effective. A number of other diversification strategies remain untested in the higher education literature.

Management Non-Profit Literature

In the following sections I examine the diversification rationales that are found within the management literature pertaining to non-profit organizations and the empirical studies related to this literature. I then identify the criteria by which the management literature evaluates various diversification strategies. The reader will see that these criteria differ fundamentally from those within the higher education literature. Finally, I examine the effectiveness of various diversification strategies, in light of the criteria within the management literature.

Diversification rationales. In contrast to the higher education literature, the non-profit management literature sees only limited use of the cost sharing rationale. Although many non-profits provide goods and services that collectively benefit the individual and society (e.g., a health organization that inoculates individuals against disease), the literature generally assumes that the public benefits outweigh private ones. As a result, this author found no equity-based argument suggesting that NPOs should diversify by shifting a greater share of costs to service users on the basis of principle. Such a rationale appears to be isolated, by and large, to the field of higher education.

Three alternative rationales are provided for why NPOs should diversify their revenue. The first rationale is developed out of resource dependence theory and the political and social relationships that exist between NPOs and the individual(s) or organization(s) that support them (Froelich, 1999; Hodge & Piccolo, 2005). Carroll and Stater (2008) argued that "non-profits are particularly subject to resource dependency" (p. 950). Likewise, Gronbjerg (1993) argued that "funding structures provide the critical context within which non-profit decision making takes place" (p. 32). From a social and psychological perspective, external funders have the ability to influence the way an NPO delivers its service or even the service that is delivered. A more

diversified revenue portfolio reduces dependence on individual external parties, thereby reducing external control over the organization. As a result, the likelihood of goal displacement (the modification of mission-related objectives in an effort to accommodate specific external parties) is reduced (Carroll & Stater, 2008; Gronbjerg, 1993; Worth, 2009).

The second rationale stems from Markowitz's (1952) portfolio theory and is put forth from an economic or financial perspective. It is argued that through revenue diversification, NPOs can reduce the volatility of their funding and increase the probability that they will remain financially viable (Chang & Tuckman, 1994; Evans & Archer, 1968; Fuller & Farrell, 1987). Revenue stability is framed as a variable over which organizations have some level of control. Greater stability will result, it is theorized, if non-profits develop multiple revenue streams that are not highly correlated. When dissimilar revenue streams are combined, favorable deviations in one source may offset or compensate for an unfavorable deviation in another, thereby reducing volatility (Froelich, 1999; Gronbjerg, 1993; Jegers, 1997; Kingma, 1993). Although collectively presented as one rationale in the higher education literature, the overlap between the diversification rationales is high. Because dependency and volatility/risk reduction were developed previously, further theoretical examination of these rationales is unnecessary. In the following section, however, I examine numerous empirical studies that have consistently affirmed the theories. The third rationale is unique to the non-profit literature and argues that NPOs should diversify in order to increase social acceptance and legitimacy (Fogel, 1994; Galaskiewicz & Bielefeld, 1998; Meyer & Rowan, 1977; Scott, 1987). Revenue heterogeneity, it is argued, signals greater buy-in from diverse yet knowledgeable resource providers. Donors may take comfort in knowing that the organization they are supporting has the endorsement of others. Increased esteem may lead to future fundraising gains and a greater likelihood of

meeting mission-related goals.

These rationales are challenged by a collection of traditionalists who argue that because diversification often involves generating revenue from earned income it may undermine non-profit legitimacy, weaken justification for receiving tax exemptions, and challenge a non-profit's ability to carry out missions that benefit society (Bush, 1992; Tuckman, 1998; Smith & Lipsky, 1993; Weisbrod, 1998). Additionally, the complexity (and related costs) associated with managing a diversified revenue base may outweigh the benefits, particularly for small NPOs (Froelich, 1999; Gronbjerg, 1993). In the following section, I review a number of empirical studies to examine whether revenue diversification produces the theorized results.

Empirical tests of diversification. Although no empirical study in the higher education literature has shown that colleges and universities with a highly diversified revenue base perform differently than their less diversified peers, a number of studies in the non-profit literature have revealed the benefits of diversification. Most studies use data obtained via Form 990 tax returns, which were shown by Froelich and Knoepfle (1996) and Froelich, Knoepfle, and Pollak (2000) to be reliable sources of information on non-profit finance. Charities with gross receipts under $25,000 and religious organizations are not required to file returns, however, eliminating them from potential datasets.

Using Form 990 data, Chang and Tuckman (1994) examined 113,525 501(c)(3) organizations and found that 94 percent were funded by more than one source but that considerable variation existed. The authors used the Hirschman-Herfindahl Index (HHI), which ranges from 0 to 1 based on the concentration of revenue. The HHI is calculated by squaring the proportion of each revenue source and then summing the resulting numbers. For example, if an entity was funded by three sources, each source accounting for 50 percent, 30 percent, and 20

percent, respectively, its HHI would be 0.38 ($.50^2+.30^2+.20^2$). An HHI of 1 represents an institution funded by only one source while an HHI close to zero represents an institution funded by a numerous and widely dispersed sources. The authors found that in comparison to their less diversified peers, highly diversified non-profits (those with lower HHI scores) had stronger financial positions, particularly higher operating margins and larger net assets.

Building on Chang and Tuckman's methodology, Greenlee and Trussel (2000) developed a study using data from the IRS Statistics of Income database created by the National Center for Charitable Statistics (NCCS). They used the HHI to examine 5,918 NPOs across 10 years and found that diversification decreased financial vulnerability, which was defined as a reduction in program expenditures in each of three consecutive years. Trussel (2002) expanded on this work with a later study of over 94,000 non-profits from the same database. He found that highly diversified non-profits were significantly less likely to experience a 20 percent reduction in net assets over three years. A later study by Hager (2001) used the HHI and NCCS data to examine 7,266 non-profits in the arts. Hager found that greater revenue diversification reduced the likelihood that an organization would cease operations, a finding congruent with Bielefeld's (1994) and Tuckman and Chang's (1991) earlier analysis of survival across multiple sectors.

Finally, Carroll and Stater (2008) conducted the largest empirical study to date. They used Form 990 data to examine 294,543 501(c)(3) organizations across 13 years, resulting in a total number of observations of 2,075,294. Carroll and Stater used a modified version of the HHI, examining just three source classifications: donative revenue (public grants and private gifts), earned income (program revenue, dues, and assessments), and investment income (sales of securities, interest, and dividends). In their study, an index score of zero represented an institution wholly funded by only one of the three revenue categories while an index score close

to one represented near even dispersion across the three categories. The authors found that a one-unit increase in their index (going from full funding from one category to equal funding from the three categories) resulted in a statistically significant decrease in revenue volatility of 3.72 percent. The mean institution was found to have an index score of just 0.305, representing fairly concentrated revenue. Nevertheless, should an institution funded by only one of the three revenue categories diversify to the mean (going from a score of 0 to 0.305), the organization could expect revenue volatility to be reduced by approximately 1.13 percent. Whether analyzed using financial indicators or measures of uncertainty, non-profit literature empirically reveals multiple benefits of diversification, supporting the second diversification rationale previously discussed.

Criteria used to determine effectiveness. The higher education literature examines the effectiveness of various diversification strategies by evaluating their effects on net revenue and generally agreed-upon educational goals such as access and equity. In the non-profit management literature, however, the interaction of revenue sources (whether one source crowds in or crowds out another) is rarely considered. Models of the motivation for voluntary donations developed by Warr (1982) and Roberts (1984) suggest that donors will be motivated to decrease their giving when other sources are increased and perceived need declines. However, when empirically tested, studies examining the phenomenon have produced widely disparate results. Government funding has been linked to growth as well as declines in private contributions, both for the entire non-profit sector and various sub-sectors. Abrams and Schitz (1978) and Lindsey and Steinberg (1990) concluded that government funding crowded out donations. In contrast, Schiff (1990), Okten and Weisbrod (2000), and Horne (2005) found evidence that giving was crowded in by government support. Other studies by Brooks (1999, 2003) and Payne (1998)

found no statistically significant relationship between the two sources. Finally, Brooks (2000b) suggested that a curvilinear relationship may exist where low levels of government funding stimulate private giving while high levels lead to crowd the latter out.

The factors affecting the relationship between non-profit revenue sources, particularly government funding and private giving, are clearly complex. Schiff (1985) found that the relationship varied by the level of government involved (local, state, or federal) as well as the type of government spending. Andreoni and Payne (2003, 2010) acknowledged that governmental support and giving may have a negative relationship, but empirically found that the phenomenon resulted from reduced NPO fundraising efforts rather than altered donor behavior. In a review of empirical studies, Brooks (2000a) concluded that, "the relationship between government subsidies and private philanthropy is highly dependent on the subsector, the level of government involved, and the specific dataset used in the analysis" (p. 213). Commercial revenue has also been associated with both increases and decreases in private contributions (Brooks, 1999; Froelich, 1999; Young, 1998). The point here is not to determine whether a positive or negative relationship exists between the largest non-profit revenue streams, nor even to evaluate the legitimacy of various studies, but simply to note that the literature thus far has been inconclusive. As a result, most non-profit studies that examine the effectiveness of potential diversification strategies exclude the effects of interaction between revenue sources from consideration or, at most, consider them only secondarily.

In place of an examination of interactive effects, non-profit studies examine how various strategies equip an organization and its management to meet mission-related goals. In accordance with the portfolio theory and resource dependence theory, diversification strategies are evaluated by their effects on revenue volatility and goal displacement (Carroll & Stater,

2008; Froelich, 1999; Horne, 2005). When viewed through this lens, all revenue dollars may not be created equal. The non-profit literature asks whether revenue is becoming more stable, thereby reducing uncertainty and allowing management greater leverage to pursue institutional programs. A strategy that provides less volatile revenue is more likely to reduce uncertainty and increase financial viability. Freed from fundraising concerns, management may expend a greater portion of their time and energy in pursuit of institutional goals.

The literature also asks whether the strategy reduces organizational dependence on external parties, thereby allowing for greater autonomy and less goal displacement. Even if a strategy increases total revenue through a greater number of funding sources and reduces the proportion of total revenue drawn from original sources, the likelihood of goal displacement may increase if the new resource providers are more likely to exert unwanted influence upon the organization. This contradicts the very purpose of diversification under resource dependence theory. A strategy that diversifies revenue toward sources that are less likely to displace institutional goals is deemed significantly more effective than one that shifts revenue to funders who are more likely to seek control of the organization. Froelich (1999) proposed two additional criteria for evaluating diversification strategies: those related to organizational processes and those related to organizational structure. While these latter two are presented as matters of secondary consideration and not necessarily a sign of an effective or ineffective strategy, NPOs should be aware of such effects as they move forward with a particular strategy. These last two effects are more fully developed in the following section. In summary then, the non-profit literature evaluates diversification strategies not according to their ability to generate greater revenue, but according to their effectiveness at generating stable revenue that more fully empowers the institution to avoid goal displacement and fulfill its mission.

Diversification circumstances and strategies. The non-profit and higher education literatures share much in common when identifying the appropriate diversification circumstances. Although lacking many specifics, the primary circumstance identified within the non-profit literature is when NPOs experience or project a significant change in the external environment, particularly one associated with a major resource provider. Environmental changes may lead to specific threats to existing funds or emerging opportunities for new revenue streams (Bielefeld, 1992; Carroll & Stater, 2008; Froelich, 1999).

Specific circumstances vary depending upon the non-profit organization, the resource provider, and the type of revenue. For example, institutions with a heavy reliance upon philanthropy should consider diversification when tax incentives related to charitable giving are amended, corporate giving policies are tightened, or as more competitors enter the market. Likewise, institutions with a heavy reliance upon governmental funding would be wise to consider diversification when transitions occur in political leadership or related public policies; when local, state, or federal agencies experience budget crises; or when other mandates (such as Medicaid) demand a greater share of available funds. Three specific diversification strategies are examined within the non-profit literature. Using the four criteria previously identified, the following sections examine the strengths and weaknesses of diversification through private contributions, government funding, and commercial activities.

***Private contributions*.** In 2008, private contributions comprised a mere 10.4 percent of total non-profit revenue (Wing, Roeger, & Pollak, 2010). The literature includes gifts from individuals, estates, corporations, and foundations within this category (Gronbjerg, 1993; Young, 2007). In 2011, gifts from individuals and estates accounted for 81.1 percent of private contributions to NPOs, corporations 4.9 percent, and foundations 14.0 percent (Giving USA,

2012). Although private contributions have declined as a percentage of total non-profit revenue, they have traditionally been seen as the cornerstone of non-profit funding, making donations the least controversial revenue source (Hall, 1987; Weisbrod, 1998). However, when evaluated in terms of volatility and goal displacement, the non-profit literature suggests that diversification through private contributions may be problematic.

Gronbjerg's (1993) mixed-method case studies examining non-profit funding represent the seminal work on revenue diversification strategies within the literature. Gronbjerg used data from organizational documents, interviews, observations, tax returns, and audit reports to examine the resource relationships of 13 medium-sized non-profits over five years. These NPOs drew revenue from a wide range of providers and were purposefully selected to be representative of the full non-profit sector. Gronbjerg's study revealed the unpredictability and volatility of private contributions. Of the 29 unique donation-related streams reported by NPOs in the study, 55 percent showed average annual changes in excess of 50 percent, with 31 percent showing annual variances that averaged 100 percent or more. High volatility was found across all four aforementioned donor types, but was highest among individuals. The disconnect between donors and provided services was reported to limit opportunities for organizations to directly influence many individual donors. Likewise, shifting giving patterns at corporations and foundations resulted in significant revenue volatility across sub-sectors. Due to high volatility in donative income, NPOs frequently expended high levels of staff, board, and volunteer effort to solicit and collect these funds. Executives from NPOs drawing a high percentage of revenue from private donations reported that they often passed over potential growth or service opportunities due to funding uncertainty and were forced to prepare contingency plans in case of funding fluctuations (Gronbjerg, 1993). Supporting Gronbjerg's conclusion, Carroll and Stater's (2008) later

empirical study found that NPOs relying primarily on contributions experienced the highest levels of revenue volatility.

A potentially more serious consequence of private contributions is goal displacement. Weisbrod (1998) suggested the optimal funding structure was embodied by the "pure" non-profit organization. Entirely dependent upon no-strings attached contributions, "the organization can produce the outputs it prefers and distribute them as it wishes" (Weisbrod, 1998, p. 168). However, the critical mass of research studies suggests that few "pure" NPOs exist. Although contributed funds are often assumed to be unencumbered, Gronbjerg (1993) found that when it comes to private contributions, "discretion and flexibility may be more imagined than real. Each of the many different types of donations presents complex exchange relationships that may not easily convert into ongoing, predictable funding levels" (p. 146). A survey conducted by the Association of Fundraising Professionals found that 25 percent of respondents admitted altering organizational goals in order to acquire a private contribution (Froelich, 1999). DiMaggio's (1986) qualitative study of NPOs in the arts suggested that major donors, who often anchor funding campaigns, have significantly more interest in exerting control over an organization than does the average giver. Small numbers of wealthy elite may thus exert undue influence over organizations adopting such a strategy (Boris & Odendahl, 1990).

Likewise, gifts from corporations and foundations were shown to lead to high levels of goal displacement as jointly sponsored programs have increasingly involved their financial backers in program governance. Useem (1987) argued that today's corporate-based philanthropy is "more closely aligned to immediate corporate self-interest…and more transforming of the recipient organizations" (p. 353). NPOs may also experience significant goal displacement by tailoring their programs to match the publicly announced funding programs of major foundations

or by accepting large, one-time gifts. Kelly (1991) found that when foundations provide start-up funding, but inadequate operating support, an NPO is often forced to reallocate its own internal funds toward fulfillment of the grantor's purposes, which often results in dramatic goal displacement.

Finally, the non-profit literature reveals that altering an entity's funding relationship with various types of external entities has significant potential to change its processes and/or organizational structure (Froelich, 1999). NPOs and their staffs may see their long accustomed way of doing business shift in response to new dynamics associated with these resource providers. Whether these effects are seen as positive or negative is context-specific and quite subjective; however, to fully evaluate a potential diversification strategy, management must not overlook procedural and structural effects. If the procedural and structural effects related to a diversification strategy clash strongly with the present capabilities and culture of an organization, various managerial challenges are likely to result from its adoption. The literature suggests that a diversification strategy designed to draw a greater percentage of gifts from private contributions is likely to turn an informal, ad hoc fundraising practice into a formalized process run through contribution officers or committees. Likewise, additional staff may be required as accountability metrics measuring efficiency and effectiveness are added to funding agreements with corporations and foundations. Over time, such a strategy may to lead to a professionalized form of administration and a greater degree of resemblance to firms in the for-profit sector (Ferris & Graddy, 1989).

Government funding. Cash grants and contracts for goods or services are the primary means of government funding that non-profits may use to diversify their revenue portfolio (Carroll & Stater, 2008; Gronbjerg, 1993; Young, 2007). In 2008, government grants accounted

for 6.8 percent of total non-profit revenue while government contracts for goods or services accounted for 20.6 percent (Wing, Roeger, & Pollak, 2010). Although challenged by present economic conditions, government funding was the least volatile revenue source in Grongberg's (1993) study. NPO directors reported that once a government grant or contract was received, continuity and predictability of funding was highly likely.

In an earlier study of six social service organizations, Gronbjerg (1990) concluded that greater reliance on government funds increased the predictability of institutional revenue, in part because public sector managers depend upon the services of NPOs. Put another way, the funding relationship between NPOs and government agencies has greater mutual dependence in comparison to the relationship between NPOs and private donors (Gottry, 1999). Although the complexity and effort in securing governmental funds was high, Gronbjerg (1990) stated that "greater continuity in and predictability of public grants (compared to donations and fees) make them particularly attractive" (p. 33). Applying portfolio theory to non-profit funding, Kingma (1993) empirically tested the covariances of revenue sources at 156 foster care organizations across four years and found that NPOs drawing a greater percentage of revenue from government sources experienced lower than average volatility.

Government revenue was also found to be more broadly accessible than private contributions (DiMaggio, 1986; Gronbjerg, 1993). In comparison to private contributions, which tend to favor large, popular, and noncontroversial NPOs, government support was more widely dispersed. The goal displacement effects of such funding may thus be more moderate than those related to private contributions. Salamon's (1987) review of government-NPO relations concluded that relatively little shift in mission occurred when institutions diversified through government funding. However, more recent studies have suggested some level of goal

displacement. Liebschutz's (1992) case study of six NPOs found increasing program diversification and shifts in program emphases in response to greater government funding through contracts. Additionally, underfunded government initiatives or delay in receipt of funds may require NPOs to redirect resources and cause goal displacement (Bernstein, 1991; Gronbjerg, 1993).

Significant process and structure effects are associated with diversification through government funding. To ensure that recipients meet statutory requirements, government agencies often require that NPOs provide standardized measures of effectiveness and efficiency on a recurring basis (Gronbjerg, 1993; Peterson, 1986). Increased compliance requirements may divert the efforts of management away from service. Alternatively, organizations may retain professional administrators who know little about the NPO's mission or services in order to manage its more involved relationship with various government entities. The more centralized structure may lead, in turn, to reduced input from direct service staff. Froelich (1999) argued that should an NPO diversify through government funding, it "risks losing its unique character as it increasingly mirrors the structure and behavior of a government agency" (p. 257).

***Commercial activity*.** In 2008, fees for goods and services accounted for 49.7 percent of total non-profit revenue, by far the largest share (Wing, Roeger, & Pollak, 2010). Earned income ventures are not new to the non-profit sector. For centuries, universities have charged tuition, hospitals have charged for health care, and theater groups have charged performance admission. However, the more recently conceived notion of "social enterprise" has suggested that NPOs have broadened their scope of commercial ventures in order to expand their impact and bolster volatile finances (Borgaza & Defourny, 2001; Crimmins & Keil, 1983; Skloot, 1988). Although the ways that NPOs can generate earned income are just beginning to be explored, commercial

activity has been the fastest growing revenue source in the last 25 years (Gronbjerg, 1993; Hansmann, 1987; Weisbrod, 1998; Young, 1998, 2007).

A chorus of protests has argued that commercialization will result in forfeiture of the distinctive values of the non-profit sector. Commercial activity may undermine the ability of NPOs to act in the public interest or lead to loss of tax-exempt status (Bush, 1992; Kramer, 1985; Powell & Owen-Smith, 1998; Tuckman, 1998; Weisbrod, 2004). Managerial behavior may be altered and organizational goals displaced in the pursuit of market-based revenue. Worse still, non-profits that don't pass the test of the marketplace may then be discontinued, robbing society of their valuable contributions. Foster and Bradach (2005) argued against encouraging NPOs to pursue the "holy grail of earned income," writing that "sending social service agencies down that path jeopardizes those who benefit from their programs and harms society itself, which depends for its well-being on a vibrant and mission-driven nonprofit sector" (p. 100). Are these concerns legitimate? Do commercial activities put non-profits in danger of losing sight of their missions?

Research has just begun to examine the effects of commercial activity in the non-profit sector, but already, a number of studies have challenged the pure traditionalist arguments against commercialization. Although some commercial activities are "mission-neutral" and only serve to drive revenue growth (e.g., renting out facilities for parties during off-business hours), many others provide both revenue growth and further the mission of the organization. Two examples are frequently cited in the literature. First, the sale of Girl Scout cookies serves to generate additional revenue and provide opportunities for girls to gain experience, build character, and learn business skills. Secondly, for social service non-profits like Goodwill Industries that have a mission to provide recovery and job-training programs, their commercial activities not only fund a portion of their programs but also provide employment for those they serve.

Although critics suggest that NPOs will leverage their tax advantages to develop ventures with limited public benefit, commercial activities related to NPOs' missions and linked to program services appear to be far more common than unrelated activities (Hodgkinson, 1989; Hodgkinson, Weitzman, Noga, & Gorski, 1993). In a mixed-methods case study of six national social service NPOs, including the American Cancer Society and the Girl Scouts of America, Young (1998) found that significant efforts were made by all association leaders to avoid activities that would damage their organizations' abilities to pursue their mission. Young found that although the connection between the commercial venture and the NPO mission was often indirect or subtle, the mission was in fact the overriding consideration in management discussions regarding which commercial activities to pursue. Activities were most often favorable to the mission, sometimes neutral, but rarely unfavorable. Young (1998) concluded:

> New sales initiatives, imposition of fees for mainline services, and collaborations with business all appear to be driven by a combination of desires to promulgate favored mission-related services and to generate surplus revenues. It appears to be the rare initiative that does not contain elements of both these motivations. (p. 295)

In Adams and Perlmutter's (1991) study, seventy percent of those surveyed reported that the organization's mission-related services were expanded by commercial ventures. Fifty-eight percent reported that the venture enabled the agency to serve new populations who otherwise would not have been reached. NPO leaders appear to take these initiatives seriously and utilize them to advance the mission. Commercial revenue, then, may be particularly attractive because such revenue is flexible and results in the least goal displacement of any major revenue source.

The literature is mixed, however, when addressing the volatility of non-profit enterprises. Gronbjerg (1993) found that the predictability and controllability of commercial revenue depends heavily on "the extent to which [non-profits] have linked their market niche and

mission, how they have structured their fee relationships, and how they couple these to other agency resources" (pp. 119–120). Large and medium-sized NPOs with significant resources were shown to have more success and less volatility in commercial ventures than were smaller organizations (Adams & Perlmutter, 1991; Bielefeld, 1992). Adams and Perlmutter (1991) examined 101 social service agencies and found that 75 percent experienced on-going positive cash flow as a result of ancillary commercial ventures. While many ventures were relatively small, twelve percent of respondents reported that these initiatives grew to over 30 percent of total revenue. Although a number of market-based initiatives do fail within the first few years, volatility for the bulk of commercial activities appears mitigated by institutional inputs and management skill. Commercial activity, then, displays lower volatility than private contributions, particularly for well-established NPOs with sizeable resources, but higher uncertainty when compared to government funding.

Diversification through commercial activity has been shown to have related process and structural effects. Regarding the former, management may assume a more business-minded mentality and increase the accountability of program officers (Peterson, 1986). New initiatives may require more cost-benefit analysis and rationalization before being pursued. Regarding the latter, studies by Adams and Perlmutter (1991) and DiMaggio (1986) found some evidence that diversification through commercial activity led to increases in the number of finance and marketing personnel on staff and a shift in board composition away from those with social service focus and toward those with significant business or entrepreneurial experience. NPOs may also be led to adopt organizational forms similar to those of for-profit entities, including franchises or subsidiaries (Gronbjerg, 1993).

Summary. Numerous empirical studies in the non-profit literature support the need for revenue diversification. Highly diversified NPOs were shown to have less revenue volatility and healthier financial indicators than their less diversified peers. Diversification was deemed most urgent when an NPO experienced or projected a material change in its external resource environment, although resource dependence theory and portfolio theory suggest that revenue diversification is a wise strategy at all times. In line with the underlying rationales for diversification, the literature presented four criteria by which a strategy's effectiveness may be assessed. Because any interactive effects (or "crowding-in/out") of sources is inconclusive, strategies were evaluated based primarily upon revenue volatility and goal displacement with secondary consideration of procedural and structural effects. Table 2 summarizes the effectiveness of the three diversification strategies found within the literature.

Table 2
Summary of Non-Profit Diversification Strategies

	Private Contributions	Government Funding	Commercial Activity
Revenue volatility	High	Low	Moderate
Goal displacement	High	Moderate	Low
Procedural effects	Formalization	Standardization, Accountability	Rationalization
Structural effects	Professionalization	Bureaucratic	Professionalized business forms

Private contributions, the traditional bedrock of non-profit finance, were shown to have the highest revenue volatility and also the highest potential for goal displacement. Numerous studies reported how NPOs experienced dramatic swings in private contributions and often shifted program emphases in order to pursue or maintain these funds. Government funding, while typically the most stable revenue source, was shown to have moderate goal displacement

effects as the availability of government contracts often entices NPOs to shift program emphases. Finally, commercial activity was shown to have moderate volatility but significantly less goal displacement than the other two strategies. Commercial revenue was shown to be the least restrictive and most flexible source of funds, frequently enabling management to subsidize mission-driven programs. NPO executives were largely shown to link commercial ventures with institutional goals and to retain the non-profit's mission as their foremost priority. The non-profit literature, then, suggests that traditionalist arguments critiquing commercial strategies are exaggerated and potentially misleading.

None of the three strategies were shown to have continuous flows of unencumbered funds, however. This ideal scenario never has nor ever will exist. Each strategy was shown to have differing constraints as well as differing procedural and structural effects. Although the literature suggests that government funding and commercial activities produce the most stable revenue and least goal displacement, when evaluating a potential strategy, the context and capabilities of an organization must be taken into consideration. Additionally, the availability and effectiveness of each of these strategies may depend heavily upon the type of activity engaged in by an organization (Chang & Tuckman, 1994). A cancer hospital, for example, may be easier to diversify through multiple parties such as donations, government, and patients than is a church which relies primarily upon member contributions. It is up to management then to weigh the available research literature with the specific needs and context of the NPO before moving forward with any of the aforementioned strategies.

Synthesis

Comparing these literatures reveals a critical shortcoming within the higher education literature. Although its rationales for diversification are relatively similar to those in the non-

profit literature and are based on the same underlying theories, the criteria used to evaluate the effectiveness of a strategy are inconsistent with these rationales and fail to capture whether or not a diversification strategy is serving its two properly intended functions: to reduce revenue volatility and external dependence.

The higher education literature conceptualizes revenue diversification as beneficial for at least two generally agreed upon reasons. In accordance with portfolio theory (Markowitz, 1952), diversification can reduce the volatility of institutional revenue as shortfalls in one source are offset by increases in another. Net revenue may not increase, but the resultant increase in funding certainty allows administrators to develop long-term initiatives and maintain institutional performance despite changes in external conditions. Although untested in the higher education literature, empirical studies of non-profit organizations have consistently supported the conclusion that highly diversified institutions have less uncertainty and healthier financial indicators than their peer institutions. In line with resource dependence theory (Pfeffer & Salancik, 1978), the higher education literature provides an accurate conceptualization that diversification can reduce resource dependence in relation to external parties and provide more autonomy for the institution. With less external influence, colleges and universities can devote a larger proportion of their resources to programs that faculty, staff, and administrators have determined most effectively promote institutional goals.

However, the higher education literature fails to evaluate potential diversification strategies using criteria that measure either their volatility or dependence-related properties. Strategies are instead evaluated by the interactive effects ("crowding-in/out") of revenue streams, if any, and their effects on access and equity. Although these criteria are relevant for consideration, they are not the most accurate measures to determine whether a diversification

strategy has met its desired objectives. Evaluating strategies solely on these measures overlooks the two critical reasons why diversification is a wise management strategy. *Diversification is not meant to maximize net revenue but to minimize risk and goal displacement.*

The non-profit literature reveals that the interactive relationship between sources is often uncertain and contingent upon a number of uncontrollable factors. Even if the relationship between sources is large and empirically definitive in the higher education sub-sector, the non-profit literature rightly informs scholarship within our field that the crowd-out/in effect is not the most accurate measure of a strategy's effectiveness. Again, the primary objective of revenue diversification, according to the agreed upon rationales in both literatures, is not net revenue growth but rather the reduction of both revenue volatility and external dependencies. Why then do the bulk of higher education studies analyze diversification strategies primarily in terms of the resultant change in net revenue? These studies almost always fail to consider the volatility of revenue streams, how the related influence of their providers may lead to goal displacement, and the potentially significant procedural and structural changes that various providers of resources often produce.

In other words, empirical studies within higher education fail to conceptualize that all revenue dollars are not created equal in many operational aspects. Some understanding of this is apparent insofar as tuition revenue is understood to be less beneficial than state appropriations when it comes to promoting access and degree completion. However, the literature's understanding does not go deep enough when considering other aspects that particular revenue sources have on the operations of an organization. A strategy that produces higher average revenue but considerably greater volatility (like the endowment investment strategies in the mid-2000s) may yield extraordinary consequences when a college or university experiences

fluctuations in external market conditions. Likewise, a college or university may vigorously pursue a strategy shown to yield higher average revenue and increase access for underrepresented students; however, if such a strategy shifts dependence toward external resource providers that desire and effectively exert greater control over the institution, significant goal displacement may result and lead a college or university far afield from its mission. The opposite is also true: a strategy that lowers average total revenue by a small percentage may actually prove to be a very successful diversification strategy if volatility, goal displacement, and unwanted procedural and structural changes are minimized. Such a strategy, however, would likely be (incorrectly) rejected by the higher education literature which shows no consideration for these important behavioral conditions.

I previously discussed how major endowment managers of late have suffered the consequences of investment strategies designed to produce the greatest financial return without consideration for the underlying purpose of the institution's endowment. The higher education literature evaluating the effectiveness of revenue diversification strategies appears to have fallen into much the same trap. Far too great a focus is given to net total revenue without consideration of how the behavior of revenue sources and providers may support or challenge the operations of the institution. Although economic conditions have challenged administrators to find new revenue, the rationale at the heart of diversification is not to provide more revenue but to provide more stable and controllable revenue in order to empower administrators with freedom and flexibility to pursue whatever missions or objectives the institution desires. Evaluated using a suitable set of criteria that are more fully in line with the properly conceptualized diversification rationales, a strategy regarded as highly successful by the higher education literature may actually prove to be ill-advised or vice versa. Indeed, this exact scenario is illustrated by the

assessments of one strategy analyzed in both literatures.

The higher education literature revealed that by shifting internal funds to research programs, large research universities may crowd-in both government support and private giving, thereby increasing expected net revenue. In this way, universities reduce the percentage of funds collected from students and parents, potentially increasing access opportunities for underrepresented students and creating a more equitable higher education system. By all measures used within the higher education literature, this strategy would be considered highly effective. However, no consideration or empirical analysis is given to how diversifying through greater governmental funding or private contributions would affect revenue volatility, goal displacement, organizational processes, or organizational structure.

The management literature, on the other hand, suggests that shifts to government funding and private contributions are likely to result in both higher volatility and greater goal displacement than would accompany earned income from tuition (see Table 2). The non-profit studies previously cited reveal that the underlying characteristics associated with private contributions create much greater uncertainty and volatility, especially when external conditions are altered. The potential for goal displacement is also increased through both governmental funding and private contributions as institutional control is shifted away from university administrators and toward government agencies, influential individuals, corporations, and foundations. Universities may feel pressure to shift program emphases in an effort to attract these funds. Likewise, when governmental or private contributions to research programs experience an unexpected shortfall, the university may be financially committed to these projects and forced to reallocate funds that were designated for other programs in order to pick up the slack. This decline in support for other programs may lead to significant goal displacement in

both the short- and long-term.

Finally, colleges and universities may experience unwanted procedural and structural changes such as heightened accountability requirements and internal bureaucratic structures as a result of this diversification strategy. Because these revenue sources behave differently than the original funding mix, the possible consequences of this diversification strategy may very well outweigh the benefits from the net increase in revenue. The higher education literature has, however, yet to produce a framework or empirical study that would take these significant effects into consideration. Failure to consider these possible consequences represents a significant gap in the existing framework used to evaluate a strategy's effectiveness.

Although other factors may be considered secondarily, any empirical study on the effectiveness of revenue diversification must begin and end with its effects on revenue volatility and goal displacement. Researchers must empirically test whether revenue is becoming more or less uncertain as a result of the strategy. Likewise, measures of external influence should be created and evaluated to determine whether control is being shifted to external parties because of the shifting of revenue streams. These are the primary questions that must be answered, yet they are continuously unaddressed in higher education studies. Setting aside the question of how to determine an acceptable threshold for now, any strategy that increases either volatility or external dependence is likely an unwise choice and defeats the very purpose of diversification. Such evaluations should still be made in the context of other factors, including effects on students and net revenue, but an increase in either of these two factors should a significant red flag.

Researchers will likely find that there is no perfect means of diversification that continually produces unencumbered funds across all institutional types with no consequences to other revenue streams or organizational processes and structure. Each strategy has particular

constraints. The key then to organizational viability and mission-faithfulness is to understand these opportunities and tradeoffs, how they interact in the context of the specific college or university, and only then to choose the diversification strategy that most effectively balances projected effects.

Chapter Three

Conceptual Model and Hypotheses

Introduction

In the prior chapter, I argued that revenue diversification, properly conceptualized, functions to reduce both the volatility of funding and external influence upon an organization. When an organization possesses multiple revenue sources, an increase in one source often offsets a shortfall in another, thereby providing more stable funding to the organization. Empirical studies from the management literature established that diversified non-profit organizations experienced several financial benefits. Likewise, a more diversified revenue portfolio curbs the influence of any one external entity and, in so doing, may reduce the likelihood of goal displacement. Such a scenario, whereby an institution possesses relatively secure funding and operational autonomy, provides administration with greater latitude for pursuing the mission of the institution.

It was further argued that volatility and potential for external influence vary significantly across the key revenue categories. Among the major revenue sources possessed by non-profit organizations, charitable giving was shown to be the most volatile and the most likely to foster significant external influence. Taking these factors into consideration, any conceptual model of revenue diversification must be designed to account for three unique phenomena, which are introduced below and discussed throughout this chapter.

First, timing dynamics must be considered because the full effect of changes in revenue

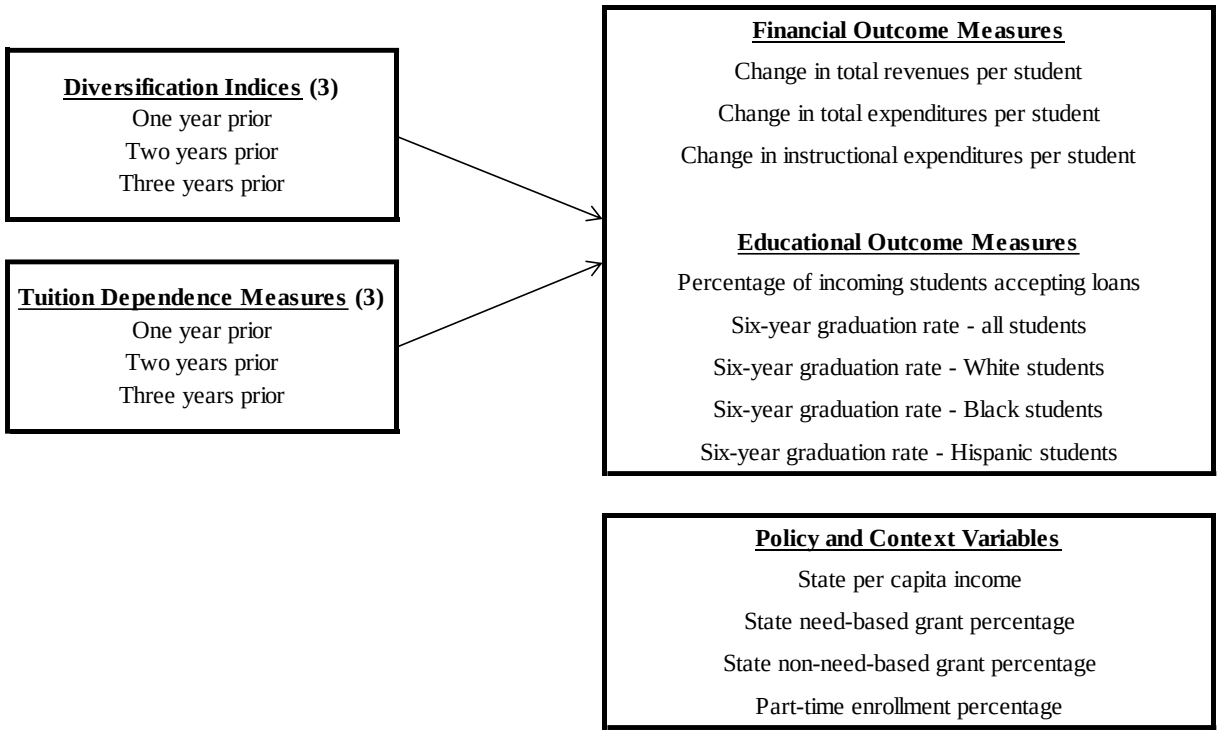
diversification likely span multiple periods. The benefits or consequences of any diversification initiative may not be experienced until several years later. Second, the model must include a measure (or measures) to assess the concentration or dispersion of revenue sources in order to provide a macro-level assessment of financial risk and external dependence. Finally, the model must explicitly account for any sizeable revenue source that possesses volatility or goal displacement properties deviating significantly from the norm. An increase or decrease in such a source may significantly change the overall volatility of and/or external influence upon the organization.

It should also be considered that if new revenue sources carry related obligations–as is often the case in higher education, with the exception of unrestricted endowment income–the mission of the institution may very well be changed by a diversification strategy. For example, it was previously discussed that non-profits that attempted to diversify through commercial activity experienced structural effects, namely, the organizations increased their finance and marketing personnel and shifted board composition toward members with business experience. The same effects may also occur in higher education as institutions shift funding composition. For example, an institution historically committed to undergraduate education, may, through the addition of additional complexity and stakeholders, be transformed into what former University of California president Clark Kerr (1963) termed a "multiversity" and described as "a whole series of communities and activities held together by a common name, a common governing board, and related purposes" (p. 1). The model which follows is designed to capture each of these aforementioned dynamics.

Conceptual Model

Figure 1 presents the conceptual model of the relationship between revenue diversification and a series of outcomes in the private, non-research university setting.

Figure 1. Conceptual Model of Revenue Diversification



Two sets of independent predictors (diversification indices and tuition dependence measures) are created and described below. For each set, one predictor is utilized for each of the one, two, and three years prior to the outcome measure. For example, revenue diversification indices and tuition dependence measures for years 2005, 2006, and 2007 serve as predictors for the 2008 dependent observation. Such an approach is warranted because the effects of revenue diversification and tuition dependence on the flow of actual dollars, educational outcomes, and institutional structures likely lag.

The first set of independent variables includes three historic diversification indices measuring the dispersion of institutional revenue. Drawing from prior studies, I utilize a form of the Hirschman-Herfindahl Index (HHI) that classifies revenue into one of five categories (net tuition, government support, private giving, endowment income, and auxiliary/affiliate). These five categories capture 100 percent of university revenue. As previously stated, an HHI of 1 represents an institution funded by only one source (no diversification), while an HHI closer to zero represents an institution funded by numerous and widely dispersed sources (high diversification). With five categories available, a perfectly diversified institution (one in which each category comprises 20 percent of the whole) would yield a diversification index of 0.2 (0.2^2 x 5), whereas an institution with no diversification (one in which a single category comprises 100 percent of the whole) would yield a diversification index of 1.0. Unless significant mission-altering commitments arise when new revenue sources are obtained, the previously developed theories suggest that institutions may benefit from a low diversification index.

The second set of independent variables includes three historic measures of tuition dependence. As detailed in Appendix A, the percentage of revenue drawn from tuition has increased across all sectors of higher education over recent years. For private institutions in the Bachelor's and Master's categories, tuition is, on average, the largest component of institutional revenue. As previously detailed when the cost sharing strategy was examined, multiple studies have examined the significant consequence of tuition dependence on student outcomes. Nevertheless, tuition revenue may theoretically be the most preferred revenue source because it is the least volatile and least likely to foster significant mission-altering levels of external influence when compared to the other four sources. Given both the significance of tuition revenue to institutions in this study and the unique characteristics of such revenue, tuition

dependence measures for each of the three prior years were included in the model as predictors.

A total of eight outcome measures are examined in this study: three financial outcomes and five educational outcomes. Year-over-year changes in total revenue per FTE student, total expenditures per FTE student, and instructional expenditures per FTE student are examined to assess the impact of revenue diversification and tuition dependence on financial outcomes. The percentage of incoming students accepting loans and six-year graduation rates in total and by ethnicity (White, Black, and Hispanic) are examined to assess the impact of revenue diversification and tuition dependence on educational outcomes.

These outcome variables were selected to assess whether revenue diversification provides greater financial stability but also to assess the impact of such changes upon institutional mission. As discussed in the following chapter, the study focuses upon private, Bachelor's and Master's institutions that often have a student-centered focus. A cursory review of the mission statement of institutions in the sample reveals a significant focus upon instruction and student outcomes, with specific goals such as: "to provide a liberal arts education of superior quality in a personalized setting" (Lyon College); "to educate students for thoughtful and productive lives and responsible leadership" (Claremont McKenna College); "[to change] the world by developing students in character, scholarship and leadership" (Indiana Wesleyan University). Inclusion of the specific outcome variables described above will assess whether revenue diversification promotes the student-focused mission of these institutions, as potentially evinced by effects such as greater instructional expenditures and higher graduation rates, or whether revenue diversification moves institutions away from their core mission and toward missions embodied by other sectors within the field of higher education, such as research or the emerging focus upon entrepreneurship.

As discussed in the following chapter, four additional variables are included in the model to account for the effects of changes in public financing policies and institutional context. Alfred (2006) correctly stressed the importance of institutional context, such as the availability of resources and influence of leaders, upon the success or failure of specific organizational strategies:

> Context–the interrelated conditions in which an institution exists and operates–shapes strategy. It does so by determining strategy frames that will be appropriate or inappropriate for a college given specific forces in its external environment, unique features of its internal organization, and the values and actions of leaders. (p. 105)

Although accounting for all contextual variables possessing potential effects on each selected outcome is beyond the scope of this study, I have included four key variables that theoretically affect the availability of multiple revenue sources as well as multiple outcomes. Effects of many time-invariant factors related to institutional context will be accounted for via statistical method, which is also addressed in the following chapter.

Hypotheses

When hypothesizing about relationships between the diversification indices and university outcomes, it is important to remember that the value of the diversification index is inversely related to the level of institutional diversification. A low index corresponds to high levels of diversification while a high index corresponds to low levels of diversification. Drawing upon the literature summarized above, the relationships between the independent diversification indices and the three financial outcome measures is theorized to be negative. In line with portfolio theory, when revenue diversification increases (evidenced by a decreasing index), greater stability of revenue likely follows. While it is possible that more diversified institutions

have some sources that are more volatile (e.g., annual giving or endowment revenue) than traditional sources (e.g., tuition), it is hypothesized that the more diversified institutions have greater year-over-year total revenue per student (H1a). Diversified institutions are less vulnerable to declines in any single source; their eggs are not all in one basket.

Regarding expenditures, prior studies in the non-profit sector have suggested that more diversified NPOs are less likely to be forced to reduce program expenditures. If this logic holds in the higher education sector, colleges and universities will be less likely to reduce total expenditures if revenue is more diversified. As revenue diversification brings greater certainty of funding, involuntary expenditure cuts are less likely, and a negative relationship between the diversification indices and year-over-year total expenditures is created (H2a). Although likely consistent, revenue diversification may affect instructional expenditures in a similar or different manner than it does total expenditures. Therefore, this study examines whether revenue diversification and tuition dependence affects this sub-category of expenditure, which promotes the general mission of institutions represented in the study. Following the same logic that informed the potential relationships between diversification indices and total expenditures, the relationship between the diversification indices and year-over-year instructional expenditures is theorized to be negative (H3a).

For many private Bachelor's and Master's institutions, student affordability and completion have increasingly become cornerstones of institutional strategy. As previously detailed, the management literature found that greater diversification of revenue yields less external influence and reduced goal displacement. If such relationships hold within the higher education sector, institutions possessing greater diversification are likely more able to direct resources toward student achievement and may yield greater student affordability and

completion than their less diversified peers. Additionally, more diversified institutions proportionately draw from a greater number of sources, thereby placing less tuition burden upon students and their families. Today's institutions are increasingly seeking to lower tuition burden in an effort to reduce student indebtedness and increase the likelihood of degree completion. In most situations where low revenue diversification is present in private universities, the institution is forced to draw the bulk of its funding from tuition revenue, placing the greatest financial burden upon its students and their families. As the cost of higher education increases for the consumer, a greater percentage of students are likely forced to accept loans. The relationship between the revenue diversification indices and the percentage of students accepting loans is, therefore, theorized to be positive (H4a). Regarding completion, the existing literature in the field of higher education clearly demonstrates the trade-off between tuition cost and measures of student success. As the tuition burden is lessened, graduation rates trend upwards. Therefore, the relationships between the revenue diversification indices and each category of graduation rates are theorized to be negative (H5a, H6a, H7a, H8a). The relationship is theorized to be strongest in relation to underrepresented students, i.e., Black and Hispanic students.

The second set of independent predictors included in the model measure tuition dependence. The effect of tuition dependence on educational outcomes has been heavily researched and was previously discussed. Consistent with the existing research, the relationships between the measures of tuition dependence and the percentage of students accepting loans are theorized to be positive (H4b). The relationships between the measures of tuition dependence and student graduation rates are likewise theorized to be negative (H5b, H6b, H7b, H8b).

Regarding financial outcomes, the effect of tuition dependence is less intuitive. Portfolio theory suggests that greater reliance upon any one investment with varying returns rarely

minimizes instability–even if returns from that source are more consistent than those of alternative investments. Although equity investments have historically had greater variability than bond investments, financial managers have effectively diversified fixed-income (bond) portfolios with some stock holdings to reduce the risk of the entire portfolio. If a similar logic holds in the financing of higher education, reducing dependence on tuition may actually increase financial outcomes, even if the revenue from the new source is more irregular. For example, a heavily tuition dependent university might diversify by increasing the number of staff in its advancement office in order to drive annual giving. Although annual giving is often more volatile than tuition, the overall stability of institutional revenue may yet increase.

However, when compared to the other four components of institutional revenue, tuition is the least volatile and least restricted in terms of use. If, per the literature, the best revenue source is that which possesses the least volatility and that which is least likely to come with commitments that alter the goals of the institution, tuition dollars are the magic elixir of higher education finance. If this logic holds, colleges and universities with a high percentage of total revenue from tuition may yield better financial outcomes than their more diversified peers. Therefore, the relationships between the tuition dependence measures and each of the three financial outcome measures are theorized to be positive, though the relationships may not be linear–or may just be negative after all (H1b, H2b, H3b). While universities cannot simultaneously pursue a strategy of revenue diversification and seek to maximize the percentage of revenue from tuition, a blended approach may be the correct course. A summary of the eight measured outcomes, the hypotheses of their relationships with each class of predictors, and the theoretical base supporting these relationships is detailed in Table 3 below. Detail regarding the methodology by which each of the variables as derived is provided in Chapter Four.

Table 3. Hypotheses and Theoretical Bases for Relationship

Outcome	Hypotheses	Theoretical Base
Change in total revenue per student	H1a: Diversification indices will be negatively related to changes in total revenue per student.	Portfolio theory
	H1b: Tuition dependence measures will be positively related to changes in total revenue per student.	
Change in total expenditures per student	H2a: Diversification indices will be negatively related to changes in total expenditures per student.	Portfolio theory, revenue theory of costs, resource dependence theory
	H2b: Tuition dependence measures will be positively related to changes in total expenditures per student.	
Change in instructional expenditures per student	H3a: Diversification indices will be negatively related to changes in instructional expenditures per student.	Portfolio theory, revenue theory of costs, resource dependence theory
	H3b: Tuition dependence measures will be positively related to changes in instructional expenditures per student.	
Percentage of incoming students accepting loans	H4a: Diversification indices will be positively related to the percentage of incoming students required to take out loans.	Resource dependence theory
	H4b: Tuition dependence measures will be positively related to the percentage of incoming students required to take out loans.	
Six-year graduation rate - all students	H5a: Diversification indices will be negatively related to the percentage of all students graduating within six years.	Resource dependence theory
	H5b: Tuition dependence measures will be negatively related to the percentage of all students graduating within six years.	
Six-year graduation rate - White students	H6a: Diversification indices will be negatively related to the percentage of White students graduating within six years.	Resource dependence theory
	H6b: Tuition dependence measures will be negatively related to the percentage of White students graduating within six years.	
Six-year graduation rate - Black students	H7a: Diversification indices will be negatively related to the percentage of Black students graduating within six years.	Resource dependence theory
	H7b: Tuition dependence measures will be negatively related to the percentage of Black students graduating within six years.	
Six-year graduation rate - Hispanic students	H8a: Diversification indices will be negatively related to the percentage of Hispanic students graduating within six years.	Resource dependence theory
	H8b: Tuition dependence measures will be negatively related to the percentage of Hispanic students graduating within six years.	

Summary

This chapter has presented a conceptual model for executing the study which follows. Drawing primarily from portfolio theory and resource dependence theory, I argued that the two primary purposes of revenue diversification are to reduce financial volatility and to reduce external influence upon the organization which may, in turn, threaten an organization's mission. With both functions in mind, two key classes of predictors were included in the model. First, to assess the dispersion of funding sources, three historic measures of revenue diversification were utilized. A modified form of the Hirschman-Herfindahl Index served this purpose. Second, because of relative stability of tuition revenue and its low likelihood for creating mission-threatening influences, three historic measures of tuition dependence were incorporated. Inclusion of both sets of predictors serves to measure overall dispersion of revenue and to account for a key individual source possessing unique characteristics that are central to the purpose of revenue diversification. Eight outcome measures were included in the model and justified based on a central theory developed previously. Finally, hypotheses of interest were proposed for formalized testing between the two different classes of independent variables and each of the eight outcome measures.

Chapter Four

Methodology

The goal of this study is to investigate whether and how revenue diversification and/or tuition dependence affect certain financial and educational outcomes for private colleges and universities, including greater year-over-year revenue and expenditures per student as well as improved graduation rates. This chapter presents the methodological procedures employed to this end, outlining details about the study population and sample, the variable operationalizations, and the statistical analyses performed. An initial investigation into possible relationships is also undertaken through presentation and discussion of descriptive statistics, a correlation matrix, and cross tabulation tables.

Population and Sample

The diversity of American higher education is unparalleled. Among other offerings, students can choose to attend relatively low-cost two-year community colleges, high-priced liberal arts colleges, state-supported research universities, or for-profit online institutions. The various models of American higher education have significant implications on their funding. Said another way, the financing options for a public, tier-one research university are considerably different from those available to a community college or a private, liberal arts college. The Carnegie Foundation for the Advancement of Teaching, however, has provided a useful typology for classifying institutions. For the purpose of this research, institutions classified by the Carnegie Foundation (2005 edition) as Private Nonprofit Bachelor's or Private

Nonprofit Master's serve as the population. A small number of institutions (15) lacked sufficient revenue source data, leaving a total of 814 institutions, to serve as the study sample. These institutions were geographically spread across 49 states (there were no institutions from Wyoming) and Puerto Rico.

While other studies would certainly be valuable contributions to the field, this group was chosen because private, four-year institutions are typically the most tuition dependent. As detailed in Appendix A, Private Bachelor's institutions and Private Master's institutions obtained 41.7 percent and 63.4 percent, respectively, of their fiscal 2010 revenue from tuition. These percentages are greater than their public peers, suggesting that private institutions with a focus on teaching may be the most appropriate population to determine whether changes in institutional revenue mix lead to improved financial and educational outcomes. Research universities were excluded because the funding options available to these more complex institutions exceed those available to their peers in the Bachelor's and Master's classifications. Development of research facilities and adoption of extensive Ph.D. programs, for example, are unattainable strategies for many of the institutions in the Bachelor's and Master's classifications. For the 2009–2010 academic year, sampled institutions had an average enrollment of 2,819; an average of 257 faculty members; and awarded an average of 648 degrees.

Using these institutions as the sample is appropriate for three reasons. First, the extent of revenue diversification and tuition dependence across and within these institutions is considerable. For the observations in the sample, the diversification indices serving as predictors ranged from .220 to .980, representing near perfect diversification and extremely little diversification–in short, the full range of the spectrum. Likewise, institutions in the sample rely on tuition for between 0.00 percent and 98.99 percent of their total revenue. Thus, there is

considerable variation across institutions. Additionally, there is sufficient change in revenue diversification and tuition dependence within institutions across years, exactly what one would desire for the type of statistical model this study employs.

Second, since the sample includes all but 15, or 1.8 percent, of the institutions in the Bachelor's and Master's categorizations, and all regions of the United States are represented, there are no obvious gaps or biases presented by missing data. Reasonable conclusions can be drawn from this study to the population. Finally, the research employed a multi-source approach to data collection. This study does not rely exclusively on any one source of data and thus does not suffer from single-source bias.

Data Collection Procedures

The primary data source for the study was the Delta Cost Project's 24-year matched dataset (covering years 1987–2010) which is maintained by the National Center for Education Statistics (NCES). The dataset contains extensive information regarding sources and uses of institutional funds as well as descriptive data such as enrollment and number of full-time faculty. Data for endowment income and six-year graduation rates was unavailable in the Delta Cost dataset, and therefore, was collected from the Integrated Postsecondary Education Data System (IPEDS), a dataset often utilized by other studies in the field. IPEDS gathers information from every college, university, technical school, and vocational institution that participates in the federal student financial aid programs. State per capita income, a variable utilized to assess environmental factors affecting diversification, was gathered from the Bureau of Economic Analysis, a division of the United States Department of Commerce. To account for each state's financing policy related to higher education, the average need-based grant and non-need-based grant were gathered from the National Association of State Student Grant Aid Programs' Annual

Surveys, while the average public tuition charge was derived from IPEDS data. When variables are described or analyzed in the following sections, the variable name given is that found in the Delta Cost Project's data dictionary or in the IPEDS data dictionary.

Independent Variables

Six independent variables are included in the model. For each of the two following types of measures, one predictor is created for each of the one, two, and three years prior to the outcome measure. For example, measures for years 2005, 2006, and 2007 serve as predictors for dependent observations in 2008. Such an approach is warranted because the effects of revenue diversification and tuition dependence on the flow of actual dollars, institutional strategy, and educational outcomes likely lag. The two types of predictors utilized in this study are diversification indices and tuition dependence measures.

Diversification indices. The model in this study was developed using diversification indices that calculate the concentration of institutional revenue. The revenue sources of a college or university can be sliced many ways and categorized into a vast array of accounts. For example, revenue from undergraduate tuition could be treated as a source distinct from graduate tuition. Even greater disaggregation would be available if tuition revenue was broken out by discipline or program. Similarly, revenue from student housing could be separated from food service revenue, or these two could be combined. Because institutions account for their revenue sources through various levels of aggregation, a higher level of categorization is necessary when national surveys are collected and analyzed.

For this study, revenue was classified into five mutually exclusive categories that capture the entirety of revenue received by each institution in the population. These five sources are:

1) *Tuition* – This category is derived from the variable (nettuition01) and represents the net amount of money an institution received from students after institutional grant aid is provided.

2) *Governmental* – This category is derived from the sum of three variables (state_local_app, state_local_grant_contract, federal10_net_pell) and represents the sum total of all money received from governmental agencies, whether local, state, or federal, and regardless of whether the revenue was derived from appropriations, grants, or contracts.

3) *Private* – This category is derived from the variable (private03) and represents the amount of money received from private sources, whether through gifts, grants, or contracts.

4) *Endowment income* – The Delta Cost Project dataset reports investment income as the annual net change in endowment funds. This measure is problematic as it includes capital gains and losses, which are often quite varied. As detailed in Chapter One, these unrealized gains and losses have a limited effect on yearly operations because institutions most often use a rolling average endowment value to determine a much smaller payout (typically four to five percent). To estimate the operating revenue derived from endowment earnings, I collected annual endowment values for each institution from the IPEDS database. Using these values, I determined the average endowment value in the three years prior to the observation year and then multiplied that average by five percent. For example, in determining revenue from endowment earnings for 2008, the average endowment value for 2005–2007 was determined and then multiplied by five percent. This measure, though an estimate, provides a much more theoretically correct valuation

for endowment income used in operations than does the measure in any available dataset.

5) *Auxiliary and affiliate* – This category is derived from the two variables (auxother_rev, affiliate01) and includes revenue sources often indirectly associated with institutional mission. This final classification includes revenue from sources such as residence halls, food service, athletics, college stores, hospitals, independent operations, booster clubs, and university presses. If revenue does not fall into one of the first four categories, it will be captured in this classification.

The sum of these five categories accounts for the total of all annual revenue received by the institution. For 2005–2010, the years providing data for this study, these five sources accounted for, on average, 56.1 percent, 4.9 percent, 13.5 percent, 5.5 percent, and 20.0 percent, respectively, of total revenue.

Drawing from the management literature that examined revenue diversification in non-profit organizations, I utilized a form of the Hirschman-Herfindahl Index (HHI), which is a continuous variable representing the concentration of institutional revenue. The yearly indices are calculated by squaring the proportion of total revenue comprised by each source and then summing the resulting numbers. With five variables in the index, the maximum level of diversification (occurring when each source represents exactly 20 percent of total revenue) would yield an index of 0.2 (calculated as $.2^2+.2^2+.2^2+.2^2+.2^2$). The minimum level of diversification would yield an index of 1.00 (occurring when one source represents 100 percent of revenue). Ceteris paribus, based on the underlying theories previously developed, institutions should benefit from a low diversification index. For the institutions in the sample, the minimum diversification index is .220 and the maximum is .980.

Tuition dependence measures. The second set of independent predictors measures the tuition dependence of institutions in the study. Tuition dependence was included in the model for two reasons. First, tuition revenue holds a high level of significance to the sampled institutions. On average, tuition revenue accounts for 56.1 percent of total revenue for institutions in the study. Second, in comparison to the other four sources, tuition revenue is often the most stable and comes with the least restrictions. Tuition revenue is derived from the variable (nettuition01) and represents the net amount of money an institution receives from students after institutional grant aid is provided. To obtain a measure of tuition dependence, I divided tuition revenue (netuition01) by the sum of the five sources previously identified. For the institutions in the sample, the minimum tuition dependence measure is 0.00 percent and the maximum tuition dependence measure is 98.99 percent.

Dependent Variables

A total of eight dependent variables (three financial outcomes and five educational outcomes) are examined in this study.

Change in total revenue per student. Portfolio theory, used to frame revenue diversification as a financial strategy, argues that a more diversified investment mix often yields less volatility in returns since a gain in one investment can offset a loss from another. Likewise, a more diversified revenue portfolio for colleges and universities may yield greater stability in revenue from year to year, enabling administration to commit to long-term strategies or weather tough economic times.

Total revenue for each year is captured by the sum of the five sources used in the diversification indices above (tuition, governmental, private, endowment income, and auxiliary/affiliate). Barring dramatic increases in efficiency, total revenue per full-time

equivalent (FTE) student should increase at a rate greater than or equal to the annual inflation rate in order to maintain existing levels of educational quality. I first converted total revenue for each year to revenue per FTE student by dividing total revenue by the variable (fte12mn), which is the sum of an institution's FTE undergraduate, graduate, and professional student enrollment. The percentage change in year-over-year revenue per FTE was then calculated and compared to the inflation rate in each year (as measured by the hepi_scalar_2010 variable). By subtracting the annual inflation rate from the percentage change in revenue per FTE, a close approximation is determined to assess whether revenue per FTE increased or decreased, in real dollar terms, and by how much. This measure was then used as the dependent variable to assess the change in total revenue per student.

Change in total expenditures per student. Prior studies of non-profit organizations found that those with more diversified revenue portfolios were less likely to reduce total expenditures in a given year, even if economic conditions lagged. The largest measure of institutional expenditures in the Delta Cost Project database is the variable (eandg01_w_auxother_sum). This variable captures total expenditures, including instruction, research, service, and auxiliary operations.

Barring dramatic increases in efficiency, total expenditures per full-time equivalent (FTE) student should increase at a rate greater than or equal to the annual inflation rate in order to maintain existing levels of quality. I first converted total expenditures for each year to total expenditures per FTE student by dividing total expenditures by the variable (fte12mn), which is the sum of an institution's FTE undergraduate, graduate, and professional student enrollment. The percentage change in year-over-year total expenditures per FTE was then calculated and compared to the inflation rate in each year (as measured by the hepi_scalar_2010 variable). By

subtracting the annual inflation rate from the percentage change in total expenditures per FTE, a close approximation is determined to assess whether total expenditures per FTE increased or decreased, in real dollar terms, and by how much. This measure was then used as the dependent variable to assess the change in total expenditures.

Change in instructional expenditures per student. Colleges and universities classified as Bachelor's or Master's institutions often place a premium on instruction as part of their mission. In accordance with portfolio theory and resource dependence theory, instructional expenditures may be less likely to face a yearly cut with greater diversification of revenue. While instructional expenditures at the sampled institutions are likely highly correlated with total expenditures, resource dependence theory suggests that it is possible for diversification to affect each institution differently. An institution that receives a significant proportion of its revenue from one or two sources may see the use of those funds become increasingly restricted by the donor and shifted away from the core mission of instruction, even if total expenditures increase. Therefore, greater revenue diversification, which allows an institution to rely less on any one source and to maintain some level of autonomy, could produce a greater likelihood of consistent instructional expenditures in order to maintain an institutional commitment to instruction. Alternatively, institutions that increase their revenue diversification by increasing the proportion of funds drawn from private donors, governmental agencies, or auxiliary enterprises may find that these efforts require financial commitments that reduce available funding for instruction. In such a scenario, instructional expenditures may decline as revenue diversification increases.

Instructional expenditures are measured by the continuous variable (instruction01). Barring dramatic increases in efficiency, instructional expenditures per FTE student should increase at a rate greater than or equal to the annual inflation rate in order to maintain existing

levels of educational quality. I first converted instructional expenditures for each year to instructional expenditures per FTE student by dividing instructional expenditures by the variable (fte12mn), which is the sum of an institution's FTE undergraduate, graduate, and professional student enrollment. The percentage change in year-over-year instructional expenditures per FTE was then calculated and compared to the inflation rate in each year (as measured by the hepi_scalar_2010 variable). By subtracting the annual inflation rate from the percentage change in instructional expenditures per FTE, a close approximation is determined to assess whether instructional expenditures per FTE increased or decreased, in real dollar terms, and by how much. This measure was then used as the dependent variable to assess the change instructional expenditures.

Percentage of incoming students accepting loans. As tuition costs have continued to exceed the rate of inflation over the last several years, student loan levels have reached record highs. In 2011, student loan borrowings exceeded credit card debt for the first time to become the second largest debt source after mortgage borrowings (Tompor, 2011). As a result, many colleges and universities, concerned that their graduates are being hampered with tremendous debt burdens for years after graduation, are increasingly focusing efforts on student affordability. If an institution's revenue is more diversified, the student's cost share through tuition, room, and board will be lessened and may result in fewer students that are forced to accept loans. If tuition accounts for a significant percentage of institutional revenue, however, student indebtedness likely rises. The percentage of first-time, full-time students accepting loans is measured by the continuous variable (loan_pct). Although this measure does not account for the amount of borrowings (a student borrowing $1,000 is treated the same as one borrowing $50,000) or the needs of part-time students, it provides a good indicator of student financial need and varies

significantly by institution.

Six-year graduation rates (4). Whether as an internal metric of educational effectiveness or as an external measure of prestige, graduation rates have historically been utilized as a measure of institutional quality. Studies have found multiple factors that promote student retention and ultimately graduation, including institutional commitment and academic/social support networks (Tinto, 1975). It is possible that institutions with greater revenue diversification may be better able to provide financial, instructional, and student service support and, as a result, experience graduation rates exceeding those of their less diversified peers. Six-year graduation rates were obtained from the IPEDS database and were analyzed for: a) all students, b) White students, c) Black students, and d) Hispanic students.

Statistical Model

Two types of variation are found in this type of panel data: inter-school and intra-school. Inter-school variation occurs between the outcomes from one institution to another. Institution A and Institution B may both possess a diversification index of 0.5 and a tuition dependence measure of 55 percent, but still produce vastly different financial and educational outcomes given the different context in which each institution functions. Intra-school variation, on the other hand, occurs within each institution over time. Institution A may produce different financial and educational outcomes across years, despite similar or different measures of revenue diversification and tuition dependence.

The effectiveness of a fixed effects regression model is that it allows one to focus on intra-school variation, determining the actual effects of changes in revenue diversification and tuition dependence. Inter-school variation is not used to estimate the regression coefficients, because this variation likely reflects omitted variables. Variables such as institutional mission,

competent leadership, and the number of competitor institutions in the region could each affect an institution's ability to diversify as well as the outcomes of such a strategy. A small liberal arts college in rural Tennessee, for example, has a significantly different operational context than that of a large comprehensive university in southern California. Fixed effects regression models address unobserved variables that do not change across observations by setting each institution as its own control, thereby accounting for a more complete environmental context. In other words, by obtaining multiple observations for each institution and examining the effect of diversification within each institution, a fixed effects model removes the effect of static omitted variables just as if these variables had been measured and included in the regression model. A dummy variable is included for each institution that controls for the average difference across institutions in any observable or unobservable predictor. The fixed effects coefficients collect all the inter-school action, leaving behind the desired intra-school action.

The key assumption in such a model is that the environmental conditions of individual institutions do not materially change across each time observation. Dramatic changes in the wealth of the region in which the institution is located or state financing policy, for example, could bias the outcomes as the model would not account for these variables. As such, four policy and context variables, which often show variation across short periods of time and have theoretical effects on the outcomes of this study, were included in the model. The model assumes that other unobservable factors that might individually affect the independent or dependent variables are time-invariant.

To develop a fixed effects model, at least two observations are required for each institution. For this study, three observations– 2008, 2009, and 2010–were utilized. This time period was an intuitive choice as it includes the main years of the Great Recession. Examining

this period may well reveal which strategies allow colleges and universities to sustain their mission during the most challenging of economic times. Independent variables for each of the three years prior to observation were included as predictors. For example, diversification indices and tuition dependence measures for 2005, 2006, and 2007 serve as predictors for the 2008 outcome measures. Similar time periods are used for all other dependent variables as shown below in Table 4:

Table 4. Independent Predictor Variables and Dependent Observations

	Independent Variables						Dependent Variable
	Diversification Indices			Tuition Dependence Measures			
	1 year prior	2 years prior	3 years prior	1 year prior	2 years prior	3 years prior	
Observation #1	2007	2006	2005	2007	2006	2005	2008
Observation #2	2008	2007	2006	2008	2007	2006	2009
Observation #3	2009	2008	2007	2009	2008	2007	2010

For each of the eight dependent variables, a linear regression model was then developed with the basic format as follows:

$$y_{it} = \mu_t + \beta x_{it} + \gamma z_i + \alpha_i + \varepsilon_{it}$$

where: y is the dependent variable,

μ is the intercept that can vary by time period,

β is the coefficient of the independent variable, representing intra-school variation,

x is the time-varying independent variable (the diversification index or tuition dependence measure),

γ is the coefficient of the institution, representing inter-school variation,

z is the time-constant specific institution,

α is the error term that does not vary over time, and

ε is the error term that varies across both institution and time but is assumed to have a mean of zero, a constant variance, and is statistically independent of all other variables,

i is the individual institution, and

t is the year.

Policy and Context Variables

As previously discussed, fixed effects regression models set each institution as its own control, thereby controlling for many unobserved variables, such as institutional mission, institution type, and quality of administrators. These factors may affect an institution's ability to diversify and the results thereof, but are controlled for by only looking at the action within each institution, rather than analyzing action across institutions. However, a fixed effects model does not account for variables that are not static. Significant shifts in the institutional or environmental contexts across observations of individual institutions could bias results. As a result, four measures of the policy and context were added to the model in order to observe their potential effects on an institution's ability to diversify its revenue portfolio and the outcomes of such a strategy. Based upon reviews of the existing higher education finance literature, variables were included for the state per capita income, the availability of need-based aid in the state, the availability of non-need-based aid in the state, and the percentage of part-time enrollment.

S**tate per capita income.** Personal income varies significantly by state and often by year. According to the United States Bureau of Economic Analysis, the per capita income in the United States was $39,791 in 2010. Mississippi had the lowest per capita income ($30,841) while Connecticut had the highest ($55,427). The per capita income in the United States changed significantly for the observation years in the study, 3.6 percent, -5.6 percent, and 3.0 percent, for the years 2008, 2009, and 2010, respectively. A great deal of literature chronicled the effects of the recession on wealth and income inequality in the United States and for the shrinking middle class. Although the average income in the United States has edged upward, the median income declined for each of the five years 2008–2012 (U.S. Census Bureau, 2013). The share of wealth controlled by the top 1% of the population now stands at 39 percent, a record

high (Boston Consulting Group, 2013).

Changes in personal income have significant effects on the operational context of universities as well as their stakeholders. Among other factors, changes in personal incomes effect income taxes, disposable income, mortality, cost of goods and services, and postsecondary enrollment (Callan & Finney, 1997; Friedman, 2008; Kaplan et. al, 1996; St. John & Musoba, 2011; Walpole, 2003). The state per capita income by year was derived from the Bureau of Economic Analysis, a division of the United States Department of Commerce**.** To scale for materiality and in order to aid in the interpretation of regression results, the variable was entered in thousands of dollars, e.g., $40,000 was entered as 40.0. A one unit change in the variable represents a $1,000 change in the state per capita income.

State need-based grant percentage and state non-need-based grant percentage. In our current political system, education remains the responsibility of states and to a lesser extent local communities. State policies link directly to educational outcomes such as high school graduation rates, achievement scores, and postsecondary enrollment. The historic model of state funding to higher education provided per student subsidies directly to public universities. The result was a relatively low tuition charge to the student, but a high cost to taxpayers for each student enrolled. As previously detailed, constraints on budgets and competing public priorities have challenged the ability of states to fund higher education.

Breneman and Finn (1978) advanced the notion that higher education financing would be more efficient and equitable if state subsidies were provided directly to students, rather than through appropriations to public institutions. Such a market-like system, in which state aid could be used for attending either public or private institutions, would promote student choice. It has been argued that this approach would also increase access to higher education as low-income

students would receive greater amounts of financial aid yielding a lower net cost, while students without need would not be affected by the higher costs–they would have enrolled anyways. Shifts of state funds from institutions toward students tend to benefit private colleges and universities for two key reasons. First, students at private institutions are provided public financial aid which they previously did not have. Second, as public institutions raise their tuitions to compensate for the reduced public funding, the price differential between private and public universities is lessened.

Over time, some states began providing both need-based and non-need-based grants directly to students, regardless of whether the student enrolled in a public or private university (Callan & Finney, 1997; Zumeta, 2004). These financing policies, however, vary significantly by state and change across time. According to the National Association of State Student Grant and Aid Programs (NASSGAP), in 2010, South Carolina provided $1,780 in total grant dollars per FTE student while Arizona provided just $31.30 per FTE student. Some states, such New York provide almost exclusively need-based aid, while others such as Georgia and Florida provide primarily non-need-based aid. In the last twenty years, a general increase has been seen regarding non-need-based aid per FTE student. Need-based aid, however, while remaining stable in actual dollars has decreased significantly as a percentage of the average tuition cost. As the Great Recession unfolded, many states scaled back both need-based and non-need-based aid programs. Institutional finances at all universities within the state, as well as student indebtedness and completion are affected by such policies (Dynarski, 2002; Heller & Marin, 2002, 2004; St. John, 2006; St. John, Daun-Barnett, & Moronski-Chapman, 2013; St. John & Musoba, 2011).

To account for shifts in state higher education financing policies, two variables were

utilized: the average state need-based grant as a percentage of average public tuition and the average state non-need-based grant as a percentage of average public tuition. An increase in either of these variables typically represents greater state funding being provided directly to students. The average need-based grant and the average non-need-based grant for each state were gathered from the annual survey reports on state-sponsored student financial aid from the NASSGAP. The average tuition charge was determined via IPEDS data by weighting the amount of tuition charged a full-time student at each four-year public campus in the state by the FTE enrollment of each campus. Public tuition charges were utilized because they provide a better indicator of state financing policy. Greater state support provided directly to students likely yields positive financial and educational outcomes to private universities, whereas reductions in state support provided directly to students likely yield negative financial and educational outcomes to private universities.

Part-time enrollment percentage. In recent years, many institutions in the sample have expanded course offerings to attract part-time students. A cursory review of the websites of sampled institutions seldom fails to reveal evening or online programs designed to serve non-traditional or adult students who otherwise would not attend. These part-time programs supplement revenue from traditional, full-time students and frequently buffer private universities, which often possess small enrollments and miniscule endowments, from year-over-year changes in matriculation. Part-time enrollment also permits traditional undergraduate students to obtain full-time employment, thereby reducing indebtedness and facilitating their progress toward their degree (Hearn, 1992; O'Toole, Stratton, & Wetzel, 2003; Stratton, O'Toole, & Wetzel, 2004). The percentage of total enrollment at each institution that is comprised of part-time students was utilized as a variable to account for these effects. Using the Delta Cost data, the part-time

enrollment percentage was determined by dividing the variable (total_part_time) by the variable (total_enrollment). This figure was then multiplied by 100 to aid in the interpretation of regression results. Variation in part-time enrollment across institutions and years is vast. Some institutions in the sample have no part-time enrollment while others have only part-time enrollment.

Data Analysis

The data in this study was analyzed using both univariate and bivariate statistical techniques.

Descriptive statistics. First, descriptive statistics were calculated for each variable (i.e. mean values, standard deviations, and range values) and are listed in Table 5.

Table 5
Means, Standard Deviations, Range Values, and Missing Data

	All Observations (n=2,442)				
		Standard	Range		Missing
Variable	Mean	Deviation	Min	Max	Data
State per capita income (in thousands)	39.223	6.735	16.300	71.220	0
State need-based grant percentage	7.50	4.95	0.00	19.59	0
State non-need-based grant percentage	3.85	9.35	0.00	54.65	0
Part-time enrollment percentage	20.83	17.76	0.00	100.00	0
Diversification index - 1 year prior	0.443	0.143	0.220	0.980	0
Diversification index - 2 years prior	0.435	0.140	0.220	0.976	0
Diversification index - 3 years prior	0.433	0.139	0.220	0.976	0
Tuition Dependence measure - 1 year prior	56.07	17.76	0.00	98.99	0
Tuition Dependence measure - 2 years prior	55.00	17.68	0.00	98.76	0
Tuition Dependence measure - 3 years prior	54.87	17.61	0.00	98.76	0
Change in total revenue per student	-0.29	17.31	-75.14	203.75	32
Change in total expenditures per student	-0.17	12.08	-54.74	181.55	34
Change in instructional expenditures per student	0.04	14.71	-72.74	205.82	33
Percentage of incoming students accepting loans	67.97	18.58	1	100	342
Six-year graduation rate - all students	54.92	18.38	2	98	171
Six-year graduation rate - White students	59.28	16.51	10	99	357
Six-year graduation rate - Black students	45.36	22.10	2	100	684
Six-year graduation rate - Hispanic students	52.57	21.75	7	100	1,038

Descriptive statistics reveal significant variation across all variables. Regarding policy and context, state per capita income ranged from $16,300 (Puerto Rico) to $71,220 (Washington, D.C.). Although each state or commonwealth provided some measure of direct student aid, financing policies vary significantly. In 2010, for example, New York provided an average need-based grant of $1,027 while Georgia provided an average of just $3.40. In non-need-based aid, however, Georgia provided an average grant of $1,762 while New York provided an average of only $35. Other states, such as Arizona and Alaska, were much more frugal in both forms of aid. In 2010, Arizona and Alaska provided an average need-based grant of just $31 and $44,

respectively, while providing zero non-need-based aid. Likewise, although the average part-time enrollment at institutions in the survey was 20.8 percent, 16 institutions had no part-time enrollment, while six other institutions had part-time enrollments of 80 percent or more.

Regarding predictor variables, significant variation exists in both the diversification indices and the tuition dependence measures. A combined analysis of the three years' diversification indices reveal that the average and median indices were 0.437 and 0.409, respectively. Significant variation exists across institutions, however. Some institutions had at least one year's index above 0.95 (Michigan Jewish Institute, City University of Seattle, Trinity International University), while others had at least one year's index below 0.25 (Lyon College, Centenary College of Louisiana, Kentucky Wesleyan College, Mount Holyoke College), the latter being much more diversified than the former. A similar story is found when analyzing tuition dependence. Some institutions in the sample (Berea College, Bryn Athyn College of the New Church) regularly drew less than 2 percent of their annual revenue from tuition while many others draw greater than 90 percent of their annual revenue from tuition. A review of tuition dependence across time reveals that on average institutions in the study increased their reliance upon tuition over the study's observation years. Tuition dependence in years 2006–2010 was 54.6 percent, 54.7 percent, 55.7 percent, 57.8 percent, and 58.6 percent, respectively. A review of the dependent variables reveals relatively large standard deviations and wide ranges on each of these outcomes, though mean outcomes were fairly consistent across years with one exception. The percentage of incoming students accepting loans increased from 67.00 percent in 2009 to 69.75 percent 2010, which corresponds to the noted increase in tuition dependence.

Correlation matrix. Next, as is the common practice to assess preliminary relationships between variables, a correlation matrix was created and is shown in Table 6.

Table 6 - Correlation Matrix

	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*
State per capita income (1)	1.00																	
State need-based grant percentage (2)	0.20	1.00																
State non-need-based grant percentage (3)	-0.18	-0.19	1.00															
Part-time enrollment percentage (4)	0.09	-0.06	-0.03	1.00														
Diversification index - 1 year prior (5)	0.20	0.08	-0.05	**0.60**	1.00													
Diversification index - 2 years prior (6)	0.20	0.09	-0.05	**0.60**	**0.93**	1.00												
Diversification index - 3 years prior (7)	0.20	0.09	-0.05	**0.60**	**0.91**	**0.93**	1.00											
Tuition Dependence measure - 1 year prior (9)	0.16	0.11	-0.08	**0.56**	**0.84**	**0.80**	**0.78**	1.00										
Tuition Dependence measure - 2 years prior (9)	0.18	0.12	-0.09	**0.56**	**0.81**	**0.84**	**0.80**	**0.93**	1.00									
Tuition Dependence measure - 3 years prior (10)	0.17	0.12	-0.08	**0.56**	**0.80**	**0.80**	**0.84**	**0.92**	**0.93**	1.00								
Change in total revenue per student (11)	0.00	0.04	-0.01	0.01	0.07	0.03	0.04	0.13	0.02	0.04	1.00							
Change in total expenditures per student (12)	0.03	0.07	0.00	-0.01	0.01	0.02	0.03	0.04	0.04	0.05	0.44	1.00						
Change in instructional expenditures per student (13)	0.04	0.07	-0.05	-0.01	-0.01	-0.01	-0.01	-0.01	0.00	-0.01	0.32	**0.73**	1.00					
Percentage of incoming students accepting loans (14)	0.02	-0.08	-0.13	0.32	0.22	0.20	0.21	0.35	0.34	0.33	0.03	-0.04	-0.04	1.00				
Six year graduation rate - all students (15)	0.02	0.01	-0.10	-0.43	-0.42	-0.41	-0.41	-0.39	-0.37	-0.37	-0.04	-0.01	0.03	-0.46	1.00			
Six year graduation rate - White students (16)	0.02	0.03	-0.13	-0.40	-0.39	-0.37	-0.38	-0.35	-0.33	-0.33	-0.04	-0.01	0.03	-0.45	**0.98**	1.00		
Six year graduation rate - Black students (17)	0.13	0.03	-0.03	-0.35	-0.33	-0.33	-0.33	-0.33	-0.32	-0.31	-0.01	0.03	0.07	-0.42	**0.77**	**0.72**	1.00	
Six year graduation rate - Hispanic students (18)	0.07	0.01	-0.03	-0.32	-0.30	-0.30	-0.29	-0.29	-0.29	-0.27	-0.03	0.00	0.02	-0.45	**0.75**	**0.70**	**0.62**	1.00

As a general rule in the social sciences, correlation coefficients above 0.7 represent a strong positive correlation, coefficients from 0.3 to 0.7 represent a moderate positive correlation, and coefficients between 0 and 0.3 represent a weak positive correlation. Negative coefficients represent similarly weighted negative correlations. In the matrix above, correlations greater than 0.5 are identified in bold. The only environmental variable moderately correlated with any independent or dependent variable is the part-time enrollment percentage (variable 4). A moderate, positive correlation was revealed between the part-time enrollment percentage and each predictor variable (variables 5–10), suggesting that institutions with numerous part-time degree programs are less diversified and more tuition dependent than peer institutions that enroll mostly full-time students. Additionally, a moderate negative correlation was revealed between part-time enrollment and each graduation rate (variables 15–18), a phenomenon higher education researchers have known about for years.

Diversification indices (variables 5–7) are strongly correlated with each other as are the tuition dependence measures (variables 8–10), showing that revenue mix is fairly consistent within institutions from period to period. Also, the diversification indices are highly correlated with the tuition dependence measures, a logical relationship as tuition revenue is a key component of the diversification indices. Positive correlations also exist between each predictor variable and the percentage of incoming students accepting loans (variable 14). While each diversification index is weakly correlated with the percentage of incoming students accepting loans, each tuition dependence measure has a moderate correlation. Moderate negative correlations also exist between each predictor variable and each graduation rate. As previously detailed in the literature review, as the cost sharing attributable to students and their families increases, student achievement measures decrease.

An interesting observation, however, is that the correlations between each diversification index and each graduation rate typically exceed the correlations between each tuition dependence measure and each graduation rate. Such a finding suggests that revenue diversification may be slightly more important than tuition dependence when seeking to improve degree completion. It is also of note that the correlations between each of the three diversification indices and all outcomes, as well as the correlations between each of the three tuition dependence measures and all outcomes are similar in direction, suggesting that together the cumulative effect of prior year's revenue diversification and tuition dependence may yield statistically significant benefits in subsequent periods.

As Bowen's revenue theory of costs would suggest, moderate positive correlations exist between the change in total revenue (variable 11) and both classes of expenditures–the change in total expenditures (variable 12) and the change in instructional expenditures (variable 13). Moderate negative correlations between the percentage of incoming students accepting loans and each graduation rate (variables 15–18) suggest that financial burden continues to have negative consequences on student degree completion. Finally, each of the graduation rates is moderately to highly-correlated with other graduation rates, a logical relationship.

Cross tabulation tables. Appendix B displays multiple cross tabulation tables in which sampled institutions were grouped in quintiles based on the six predictor variables–the relative diversification indices and tuition dependence measures in each of the one, two, and three years prior to observation. Institutions were ranked from most diversified (lowest index) and most tuition dependent (highest tuition dependence measure). Corresponding measures of five dependent variables (changes in total revenue per student, total expenditures per student, and instructional expenditures per student as well as the percentage of incoming students accepting

loans and graduation rate) are also displayed. Analysis of the tables reveals numerous associations between variables that are consistent with the theories previously developed.

First, regarding revenue diversification, for each of the one, two, and three years prior to observation, institutions in the first quintile of diversification consistently reported the highest average graduation rate and the lowest average student indebtedness at matriculation. For institutions in the first diversification quintile, the graduation rate was no less than 6.6 percent higher than the sample average for each of the three observation periods. Likewise, the percentage of incoming students accepting loans in first quintile institutions was no less than 5.1 percent lower than the sample average for each of the three observation periods. While many of these first quintile institutions are elite institutions that draw significant revenue from endowment distributions and annual giving, and that often draw academically talented, upper-class students, the sizeable difference in educational outcomes cannot be ignored. The summary data provide initial indication that Hypotheses 4a and 5a may be supported.

Financial outcomes tended to vary across quintiles with the exception of 2009, the worst of the recession years. As previously discussed, in 2009 the sector saw historic declines in both endowment values and charitable giving (two of the five components in the diversification measure). In 2009, institutions in the first and second quintiles of revenue diversification according to the prior year's index reported average declines in total revenue per FTE student (-2.9 percent and -2.3 percent, respectively), while institutions in the third and fourth quintiles experienced, on average, slight increases. Institutions in the lowest quintile, interestingly, saw an average increase in total revenue per FTE student of 2.4 percent in that year. However, such a result is primarily attributable to the unique economic circumstances of that year and not indicative of typical results.

In regards to tuition dependence, for each of the one, two, and three years prior to observation, institutions in the first quintile of tuition dependence consistently reported the lowest average graduation rate (under 50 percent in each observation year) while institutions in the second quintile of tuition dependence reported the second lowest graduation rate in each observation year. Quintiles 3–5 produced very similar average graduation rates, suggesting that the relationship between the constructs may not be linear but that moderate dependence on tuition may be just as beneficial as low levels of tuition dependence in promoting student achievement. The summary data provide initial indication that Hypothesis 5b may be supported.

Tuition dependence did, however, prove beneficial in 2009. The top three quintiles reported average increases in total revenue per FTE student, while the bottom two quintiles (institutions with relatively small portions of revenue from tuition) experienced average declines of 3.6 percent and 4.4 percent, respectively. The last quintile of tuition dependence experienced the greatest average decline in revenue per FTE student in each of the years 2008–2010 and the greatest average declines in both total expenditures and instructional expenditures per FTE student for 2010. The summary data provide initial indication that Hypothesis 1b may be supported.

Summary

Chapter Four has presented the methodological approach employed for this quantitative study. Using a sample of 814 private Bachelor's and Master's institutions, the effect of revenue diversification and tuition dependence on three financial and five educational outcomes will be examined. Two different types of predictors (diversification indices and tuition dependence measures) are included in the model. For each type, three different predictors are included for the one, two, and three years prior to the outcome measure, resulting in a total of six independent

variables in each model.

The selected dependent variables are of two types: financial and educational. Changes in total revenue, total expenditures, and instructional expenditures represent the financial outcomes, while the percentage of first-time students accepting loans and four different graduation rates (all students, White students, Black students, and Hispanic students) represent the educational outcomes. Each of the financial variables were calculated from year-over-year inflation-adjusted changes relative to student populations and the method for this calculation was explained. The chapter then developed the fixed effects model utilized in the study, provided a detailed justification for such a selection, and outlined the necessary policy variables included in the model. Descriptive statistics for each variable were provided that showed significant variation across institutions, a desired feature for the type of statistical model employed. Finally, preliminary correlations were examined that suggested that logical relationships based on the theories developed in the prior chapter may be present.

Chapter Five

Results

Introduction

In Chapter Two, a thorough literature revealed that revenue diversification was a sound strategy for reducing both volatility (portfolio theory) and external influence upon an organization (resource dependence theory). In Chapter Four, descriptive statistics revealed significant variation within each of the study's variables. Cross tabulation tables were also provided that showed preliminary evidence that highly diversified institutions consistently experienced lower student indebtedness at matriculation and higher graduation rates than their less diversified peers, while the most tuition dependent institutions experienced the lowest graduation rates. Financial outcomes were somewhat mixed.

In this chapter, I report the results of the regression analyses that are used to explain the observed variance and test the proposed relationships suggested by the aforementioned theories and prior data analysis. Corresponding to the visual presentation of the outcome measures in the conceptual model, this chapter first presents the regression results of the financial outcome models, followed subsequently by the regression results of the educational outcome models. In each section, the partial models and the full model for each of the eight regressions are presented, including details of the explanatory power of the environmental and predictor variables. Second, specific results are described in relation to each of the 16 hypotheses regarding the revenue diversification indices and tuition dependence measures of interest. The findings and their

implications will be discussed in Chapter Six.

As discussed previously, the data for each regression model was entered in three block steps–two partial models and one full model. The policy and context variables were entered in first to form what I term the context model. Second, the diversification indices were entered as independent variables so as to parcel out the effect of these variables of interest. This second model is from here on referred to as the index model. Finally, the tuition dependence measures were included as additional independent variables to form the full model. This approach to modeling is a useful technique for separating the effects of groups of variables for meaningful examination in a logical sequence. Since the intent of this study was to account for the effects of internal and external institutional context, and to examine the differing effects of both revenue diversification and tuition dependence, a block-step design was appropriate.

Regression Results of Financial Outcome Models

Regression Models 1–3 represent regressions performed on year-over-year changes for each of the financial measures: total revenue per FTE student, total expenditures per FTE student, and instructional expenditures per FTE student. For each of these financial outcome models, Table 7 presents the regression coefficients and significance levels for each variable as well as the F-value, R^2, and degrees of freedom for each model.

Table 7
Regression Results of Financial Outcome Models

	Model 1: Revenue N=2,410			Model 2: Total Expenditures N=2,408			Model 3: Instructional Expenditures N=2,409		
Variables	Context Model	Index Model	Full Model	Context Model	Index Model	Full Model	Context Model	Index Model	Full Model
Control variables									
State per capita income (in thousands)	-0.225	-0.206	0.001	-0.964 ***	-0.969 ***	-0.985 ***	-1.219 ***	-1.221 ***	-1.243 ***
State need-based grant percentage	-0.800 *	-0.534	-0.051	0.322	0.341	0.316	0.251	0.351	0.307
State non-need-based grant percentage	-0.146	0.216	1.239 **	1.493 ***	1.467 ***	1.476 ***	1.317 **	1.283 **	1.190 **
Part-time enrollment percentage	0.178	0.219	-0.040	-0.022	-0.025	-0.020	-0.054	-0.065	-0.041
Diversification indices (for each 0.1 change)									
1 year prior		5.685 ***	-8.829 ***		0.038	-0.154		0.527	1.788
2 years prior		-0.507	-3.020 **		0.479	0.335		2.222 **	2.586 **
3 years prior		2.449 *	-1.218		0.983	0.021		2.729 ***	2.906 **
Tuition dependence measures									
1 year prior			1.938 ***			0.009			-0.169 *
2 years prior			0.244 **			0.020			-0.043
3 years prior			0.321 ***			0.130			-0.009
F-Value (model)	1.29	4.11 ***	33.28 ***	6.82 ***	4.10 ***	3.12 ***	5.08 ***	4.26 ***	3.28 ***
Degrees of freedom (model)	1,594	1,591	1,588	1,592	1,589	1,586	1,593	1,590	1,587
F-Value (additional variables)		7.85 ***	99.54 ***		0.48	0.84		3.15 **	0.98

*p<.1 **p<.05 ***p<.01

In each of the financial outcome models, the F-test demonstrates that some variables in the model explain statistically significant variances in the outcome measure. Results of each individual model are described below.

Model 1: Change in total revenue per student. The first model examines how changes in environmental financial conditions and internal revenue structures affect annual changes in total revenue per FTE student. Significant findings from this model could assist higher education administrators in determining the most effective revenue structure whereby future funding is secured and risk is minimized. Findings may also provide an understanding of how economic conditions and state financing mechanisms affect the availability of institutional funding.

The revenue model had a statistically insignificant F-value of 1.29 in the context model. However, the model was improved significantly in the index and full models, resulting in F-values of 4.11 and 33.28, respectively, both statistically significant at the 0.01 level. Following both the second and the full iterations, a partial F-test was conducted on each block of added

variables to determine if the effect of any of these variables was significant. The test revealed that both the diversification indices and the tuition dependence measures were statistically significant at the 0.01 level, suggesting that the predictive effect of the model increased across each iteration. The final model accounted for a relatively substantial 17.3 percent of within-institution variation.

In the full model, the average state non-need-based grant as a percentage of average public tuition was the only environmental factor having a significant effect ($p<.05$). A one percent increase in this measure accounted for a 1.24 percent increase in total institutional revenue per FTE student. The dollar impact of changes in state non-need-based aid to the institutional revenue of private universities is sizeable. In 2009, institutions in the sample reported an average total revenue per FTE student of $23,900. Controlling for inflation, a 1.24 percent decline would result in an estimated $296 less revenue per FTE student in 2010. When multiplied against the average enrollment of sampled institutions (2,580), total institutional revenue would fall an estimated $764,000 in 2010 should the average institution be located in a state that reduced the percentage of public tuition cost provided directly to students through non-need-based grants by one percent.

Non-need-based funding at the state level has not had a strong track record of late. In 2009, 16 states increased the average non-need-based grant as a percentage of public tuition (none by greater than one percent) while 21 states decreased the measure (two by greater than one percent). Budget shortfalls and shifting policy priorities resulted in much greater declines in 2010 when only four states increased the measure (none by greater than one percent) and 33 states decreased the measure (ten by more than one percent). Florida and Georgia led the way with decreases of 5.5 percent and 4.4 percent, respectively. Thirteen states provided zero dollars

of non-need-based aid in 2010 and 33 states provided less than one percent of the average public tuition cost in non-need-based aid.

As state non-need-based aid programs decline in prevalence, student choice and access declines, resulting in full-time enrollment declines and/or increased student indebtedness at private universities unless institutional aid covers the lost funding. If private colleges and universities increase institutional financial aid to cover the lost funding from the state (a luxury that many smaller private institutions do not have), net tuition revenue declines and a smaller amount of funds are available for sustaining or expanding operations. Said another way, as non-need-based aid declines, higher performing students more frequently choose lower cost public institutions, reduce their enrollment status to part-time, or choose not to enroll in higher education at all. To continue attracting these high-quality students, private institutions are forced to discount their tuition prices more heavily, losing needed operational revenue. This significant finding supports recent lobbying efforts by private college and university associations attempting to maintain state grant programs and ensure that these funds may be used at the student's institution of choice.

Although not significant in the index or full models, the average state need-based grant as a percentage of public tuition had a negative effect in each model and was statistically significant ($p<.1$) in the context model. The model suggests that need-based aid has less benefit than non-need-based aid to the funding of private universities. Although increases in the state need-based grants have been shown in other research to increase student access to higher education as a whole, the access is mostly restricted to public institutions as the relative size of state grants compared to the tuition charges at private institutions is small. Subsequent models confirm the greater relative importance of state non-need-based aid over need-based aid for improving other

outcomes at private colleges and universities.

In the index model, significant coefficients were found regarding the effect of the diversification indices one year prior ($p<.01$) and three years prior ($p<.1$). Counterintuitively, increases in these diversification indices (which signal a reduction in diversification) increased institutional revenue per FTE student during the observation years. Such a finding may seem inconsistent with portfolio theory until one remembers that each of the five classifications of revenue sources varies in volatility and the likelihood of goal displacement, as detailed in Chapter Two. Institutions in the study are, on average, funded by at least 55 percent tuition revenue in each observation year. An increase in revenue diversification, therefore, most often signals a shift away from tuition revenue toward a more volatile source. Chapter Two also examined the financial challenges that impacted government funding, charitable giving, and endowments during the observation years of this study. Therefore, given both the significance of tuition revenue to institutions in the study and the relative stability and freedom of use that tuition revenue represents when compared to the other four sources, tuition dependence measures were added to the model in order to more accurately assess the impact of changes in institutional revenue structure.

When tuition dependence measures were added in the full model, the effect of the prior year's diversification index remained significant ($p<.01$) but changed direction, while the three year prior index became insignificant. The diversification index effect for the second year prior became significant ($p<.05$) and was also negative. As previously discussed, the diversification index is inversely related to the level of institutional diversification. Once measures of tuition dependence were added, a 0.1 unit decrease in the prior year's diversification index (an improvement in institutional diversification) resulted in an 8.83 percent increase in year-over-

year revenue. A 0.1 unit decrease in the diversification index from two years prior resulted in a 3.02 percent increase in year-over-year revenue.

A 0.1 unit decrease in the index represents a sizeable shift in revenue structure, but it is not uncommon. Table 8 displays the 2006–2010 revenue structures and diversification indices for three sampled institutions. Each institution became more diversified during this time period, as evidenced by the declining indices. However, each institution utilized different means to effect this diversification. American Jewish University (California) has historically relied upon private giving for more than two-thirds of its annual revenue. During the recession, the university reduced its reliance upon private giving while increasing the amount of revenue drawn from auxiliary and affiliate sources, as well as tuition. Hampshire College (Massachusetts) also increased the amount of revenue drawn from auxiliary and affiliate sources, which allowed the institution to reduce its tuition dependence from over 70 percent to below 60 percent. Finally, whether intentional or as a result of market conditions, Rockhurst University (Missouri) decreased its reliance upon auxiliary and affiliate revenue and increased its tuition dependence. Each approach was effective in reducing dependence upon the institution's primary revenue source.

Table 8. Yearly Changes in Diversification Indices, Select Institutions

		Components of Total Revenue by Percentage						
Institution	Year	Tuition	Governmental	Private	Endowment Income	Auxliary & Affiliate	Index	Change
American Jewish University	2006	0.114	0.013	0.666	0.022	0.185	0.491	
	2007	0.103	0.003	0.684	0.016	0.194	0.516	0.025
	2008	0.133	0.006	0.486	0.030	0.345	0.374	-0.142
	2009	0.177	0.013	0.448	0.043	0.319	0.336	-0.038
	2010	0.149	0.008	0.462	0.042	0.339	0.352	0.016
Hampshire College	2006	0.737	0.011	0.099	0.033	0.120	0.569	
	2007	0.774	0.011	0.100	0.036	0.079	0.617	0.048
	2008	0.711	0.009	0.091	0.036	0.153	0.539	-0.078
	2009	0.605	0.014	0.106	0.041	0.234	0.434	-0.105
	2010	0.598	0.023	0.101	0.040	0.238	0.427	-0.007
Rockhurst University	2006	0.127	0.004	0.031	0.013	0.825	0.698	
	2007	0.160	0.001	0.028	0.014	0.797	0.662	-0.036
	2008	0.197	0.004	0.038	0.015	0.746	0.597	-0.065
	2009	0.258	0.015	0.047	0.017	0.663	0.509	-0.088
	2010	0.305	0.006	0.147	0.018	0.524	0.390	-0.119

Finally, each of the three tuition dependence measures was statistically significant–the one and three years prior at the $p<.01$ level and the two years prior at the $p<.05$ level. A one percent increase in the percentage of total revenue from tuition in the one, two, and three years prior resulted in year-over-year revenue increases of 1.94 percent, 0.24 percent, and 0.32 percent, respectively. Many institutions in the sample shifted tuition dependence by more than 5 or even 10 percent in a single year. Such shifts signal significant effects on year-over-year changes in total revenue per FTE student. Although other research (including later models in this study) document the consequences of tuition dependence on some educational outcomes, increasing tuition dependence in challenging economic periods was shown to stabilize institutional finances. In sum, the model suggests that institutional revenue per FTE student was improved when institutions diversified away from their primary source, but did so with a close eye on shifts

away from or towards tuition revenue, typically the most stable of the five sources.

Model 2: Change in total expenditures per student. The second model examines how changes in environmental financial conditions and internal revenue structures affect annual changes in total expenditures per FTE student. Significant findings from this model could aid administration in structuring revenue sources so as to maintain or expand institutional programs and in understanding how economic conditions and state financing mechanisms affect the ability of the institution to spend. Many have argued that educational quality and prestige are directly tied to expenditures per student (Bowen, 1980).

The total expenditures model had statistically significant F-values ($p<.01$) in each of the control, index, and full models. Following both the second and the full iterations, a partial F-test was conducted on each block of added variables to determine if the effect of any of these variables was significant. The test revealed that neither the diversification indices nor the tuition dependence measures were statistically significant. Revenue mix had no statistically significant effect on changes in total expenditures in the periods studied. When viewed in tandem with the revenue model, such a finding suggests that annual revenue and total expenditures are loosely coupled. For sampled institutions, a substantial portion of annual expenditures are likely committed prior to securing significant components of annual revenue. Although statistically insignificant, the effect of both diversification indices and tuition dependence measures increased the further back one looks into the past. If predictors for four or more years prior were utilized, significant findings may be found.

In each model, two of the four controls showed significance ($p<.01$). A $1,000 increase in state per capita income resulted in a decline in total expenditures per FTE student of 0.99 percent. Although several factors outside the model may influence this finding, the most likely

rationale is that increases in wealth allow many families to send their children to more expensive private institutions that are perceived as higher quality. Expenditures, however, are often budgeted in advance and primarily fixed in the short-term. Therefore, if expenditures remain relatively constant and enrollment increases due to greater student choice, expenditures per FTE student decline. The result is more a function of the measure's numerator being fixed and predetermined while the denominator is variable and determined only once enrollment numbers are finalized. Likewise, declines in wealth may result in lower than expected enrollment as families shift to less expensive public institutions, including community colleges. Fixed expenditures are then spread across a lower number of students resulting in increased expenditures per student.

Similar to the finding of the revenue model, the average state non-need-based grant as a percentage of average public tuition had a significant positive effect. A one percent increase in this measure accounted for a 1.48 percent increase in total expenditures. The increased availability of state funding allowed private institutions to increase operational expenditures. When state non-need-based aid declined, institutions were forced to reduce expenditures and/or replace state financial aid with institutional funds in order to maintain enrollment.

Model 3: Change in instructional expenditures per student. The third model examines how changes in environmental financial conditions and internal revenue structures affect annual changes in instructional expenditures per FTE student. Significant findings from this model could aid administration in structuring revenue sources so as to maintain or expand an institution's focus on teaching. Findings may also illuminate the benefits or risks of revenue diversification on institutional mission, since the majority of institutions in the sample place primary emphasis upon providing an excellent undergraduate education. Additionally, findings

regarding state funding mechanisms could inform public policy that has, of late, sought to increase the number of young adults completing a Bachelor's degree. Among other benefits, greater instructional expenditures yield lower student-teacher ratios and improved instructional technology, both of which have been shown in prior research to support increases in student learning and graduation rates.

The instructional expenditures model had statistically significant F-values ($p<.01$) in each of the control, index, and full models. Following both the second and the full iterations, a partial F-test was conducted on each block of added variables to determine if the effect of any of these variables was significant. The test revealed that the diversification indices were statistically significant, but not the tuition dependence measures. In each model, two of the four controls showed statistical significance–state per capita income at the $p<.01$ level and the state non-need-based grant percentage at the $p<.05$ level. A $1,000 increase in state per capita income resulted in a decline in instructional expenditures per FTE student of 1.24 percent. A similar finding occurred in the total expenditures model. As previously discussed, the most likely rationale is that increases in wealth allow many families to send their children to more expensive private institutions that are perceived as higher quality. Instructional expenditures, however, are often budgeted in advance and primarily fixed in the short-term. Last minute accommodations for increased enrollment are often satisfied by adding a course with a low-paid adjunct instructor. Therefore, if expenditures remain relatively constant and enrollment increases due to greater student choice, instructional expenditures per FTE student decline. The result is more a function of the measure's numerator being fixed and predetermined while the denominator is variable and determined only once enrollment numbers are finalized. Likewise, declines in wealth may result in lower than expected enrollment as families shift to less expensive public institutions, including

community colleges. Fixed instructional expenditures are then spread across a lower number of students resulting in increased instructional expenditures per student.

Similar to the findings of the revenue and total expenditures models, the average state non-need-based grant as a percentage of average public tuition had a significant positive effect. A one-percent increase in this measure accounted for a 1.19 percent increase in instructional expenditures per FTE student. The data indicate that when states increase financial aid to students through non-need-based aid, private institutions utilize those funds primarily for instruction. Such data provide support to policy-makers questioning whether private institutions are good stewards of the state funds their students receive.

Interestingly, the diversification index one year prior was insignificant but the indices in the second and third years prior were both significant ($p<.05$) and positive. A 0.1 unit decrease in the diversification index from two years prior (an increase in institutional diversification) resulted in 2.59 percent decrease in year-over-year instructional expenditures per FTE student. A 0.1 unit decrease in the diversification index from three years prior resulted in a 2.91 percent decrease in year-over-year instructional expenditures per FTE student. Since the average instructional expenditure per FTE student in 2010 was $7,610, such a shortfall represents significant dollar reductions devoted to instruction. Total expenditures (model 2) were unaffected by revenue diversification, but a sharp reduction occurred in instructional expenditures.

This finding, which contradicts Hypothesis 3a, is noteworthy. It was hypothesized that institutions with more diversified revenue sources would experience less goal displacement and consequently be able to direct expenditures toward their primary mission, which in most sampled institutions is providing a high quality undergraduate education. Since the average institution in

the sample is dependent upon tuition for well over half of its revenue, increasing diversification most often occurs when institutions reduce reliance upon tuition and increase funding from governmental, private giving, or auxiliary sources. The model suggests that when institutions diversify their revenue sources, institutional funds may be shifted from instruction and toward activities that procure or support the new source. Institutions attempting to diversify through increasing private giving may reallocate material amounts of resources from instructional expenditures to fundraising departments. Similarly, efforts at diversification through increasing government funding may require utilizing funds historically devoted to classroom instruction for new personnel assigned to grant writing. Noting the increased complexity of higher education in the 21st century, the decline of faculty input into the governance process, and the historic increases of administrative headcounts (and salaries), Ginsburg (2012) cautions against the shift of resources away from instruction and toward administration. Likewise, the instructional expenditures model provides a caution for all higher education stakeholders to closely monitor the implicit trade-offs attached to potential funding sources.

Regression Results of Educational Outcome Models

Regression Models 4–8 represent regressions performed on each of the educational outcome measures: the percentage of incoming students accepting loans, and six-year graduation rates in total and by ethnicity. Table 9 presents the regression coefficients and significance levels for each variable as well as the F-value, R^2, and degrees of freedom for each model.

Table 9
Regression Results of Educational Outcome Models

	Model 4: Student Indebtedness N=2,099			Model 5: Grad Rate - All N=2,270			Model 6: Grad Rate - White N=2,084			Model 7: Grad Rate - Black N=1,758			Model 8: Grad Rate - Hispanic N=1,404		
Variables	Context Model	Index Model	Full Model	Context Model	Index Model	Full Model	Context Model	Index Model	Full Model	Context Model	Index Model	Full Model	Control Model	Index Model	Full Model
Control variables															
State per capita income (in thousands)	0.106	0.093	0.094	-0.126	-0.133	-0.141	-0.179	-0.176	-0.179	0.005	0.009	-0.022	0.176	0.222	0.239
State need-based grant percentage	-0.824 ***	-0.792 ***	-0.807 ***	-0.191	-0.208	-0.233 *	-0.082	-0.061	-0.073	-0.623 *	-0.588 *	-0.618 *	0.296	0.304	0.341
State non-need-based grant percentage	-0.572 **	-0.545 *	-0.559 *	0.283	0.253 *	0.266 **	0.418 *	0.413 *	0.445 *	1.049 **	1.075 **	0.972 **	0.144	0.291	0.307
Part-time enrollment percentage	0.036	0.040	0.039	0.088 *	0.085	0.089	-0.013	-0.013	-0.016	0.162	0.162	0.189	-0.215	-0.224	-0.248
Diversification indices (for each 0.1 change)															
1 year prior		0.789	1.092		-0.411	-0.405		0.050	-0.223		0.576	1.850		1.795	1.264
2 years prior		-0.335	-0.606		0.108	-0.320		0.566	-0.034		0.499	1.403		-1.147	-0.879
3 years prior		0.694	0.898		0.311	-0.313		0.329	-0.107		0.170	0.083		-1.368	-1.694
Tuition dependence measures															
1 year prior			-0.043			-0.015			0.022			-0.155			0.088
2 years prior			0.043			0.061			0.083 *			-0.120			-0.048
3 years prior			-0.022			0.082 **			0.053			0.027			0.034
F-Value (model)	6.75 ***	4.41 ***	3.26 ***	1.89	1.39	1.71 *	1.20	0.93	1.02	2.05 *	1.23	1.23	0.54	1.00	0.81
Degrees of freedom (model)	1,395	1,392	1,389	1,568	1,506	1,503	1,385	1,382	1,379	1,168	1,165	1,162	932	929	926
R^2 (within institution)	0.019	0.022	0.023	0.005	0.006	0.011	0.004	0.005	0.007	0.007	0.007	0.011	0.002	0.008	0.009
R^2 (overall)	0.016	0.014	0.012	0.093	0.097	0.089	0.038	0.072	0.068	0.016	0.023	0.022	0.111	0.118	0.112
F-Value (additional variables)		1.28	0.58		0.73	2.46 *		0.56	1.24		0.14	1.22		1.62	0.35

*p<.1 **p<.05 ***p<.01

In contrast to the financial models, the F-tests of the educational outcomes models reveal less statistical significance. Results of each individual model are described below. Additional factors affecting each outcome are also discussed via a review of recent empirical studies.

Model 4: Percentage of incoming students accepting loans. The fourth model examines how changes in environmental financial conditions and internal revenue structures affect the percentage of incoming students that go into debt upon matriculation. Significant findings from this model could aid administration in structuring revenue sources so as to reduce the financial burdens upon students and families. Additionally, findings may also increase understanding within the field as to how economic conditions and state financing mechanisms affect student indebtedness. Such knowledge could inform both state- and national-level public policy increasingly concerned with the consequences of the fourfold increase in student loan debt over the last decade.

The model examining student indebtedness and matriculation had statistically significant F-values ($p<.01$) in each of the control, index, and full models. Following both the second and the full iterations, a partial F-test was conducted on each block of added variables to determine if

the effect of any of these variables was significant. The test revealed that neither the diversification indices nor the tuition dependence measures were statistically significant. However, in each model, two of the four controls showed statistical significance. Both forms of state financial aid served to reduce student indebtedness at matriculation with the largest effect, both in magnitude and statistical significance, occurring with need-based aid–a logical finding. A one percent increase in the average need-based grant as a percentage of public tuition resulted in 0.80 percent fewer students taking out loans upon matriculation. Similarly, a one percent increase in the state non-need-based grant percentage resulted in 0.56 percent fewer students taking out loans upon matriculation. These findings provide additional evidence regarding the benefits of state funding to students and may be used in the lobbying efforts of private universities.

Apart from variables in the model, other external factors have been examined in the literature as causes for the rise in both the number of student borrowers and the amounts borrowed. Primary among these factors is the increased public perception of higher education as a private good. State taxpayers have become hesitant to allocate money to higher education as the social contract between governments and universities has been replaced by market-responsive colleges and universities catering to the needs of customers, resulting in higher tuition costs passed along to students. Public funding remains available to students. However, rather than historically generous grant aid, more of this funding has shifted to loans carrying less subsidized interest rates and greater fees (Hearn, 1998; Hearn & Holdsworth, 2004; Zumeta, Breneman, Callan, & Finney, 2012). Some conservative policy-makers have argued that loans are superior to grant aid. While both sources provide student access to higher education, loans have been argued to encourage productive labor and a sense of social obligation after graduation.

Two additional factors are worthy of consideration. Greenstone and Looney (2013) found evidence that today's college students are relying more on debt to finance their education and paying less out of pocket, suggesting that student behavior is partially responsible for some increase in indebtedness. Additionally, Akers, Chingos, and Henriques (2013) estimated that rising education attainment from 1989 to 2010 (i.e., students pursuing graduate education in greater measures) accounted for 20 percent of the increase in student indebtedness over that period.

The literature identifies several consequences of such a shift in the financing of higher education. In their studies examining student loan defaults, Coomes (1998) and Volkwein and Cabrera (1998) both found that the characteristics of the student–not institutional mission or quality–were the best predictor of student default rates. Low-income and minority students consistently have the highest loan default rates. These same students are also the most resistant to accept loans (Paulsen, 1998; St. John & Noell, 1989). While federal loan programs were designed to promote access to higher education, thereby bridging the gap in the distribution of income, wealth, and opportunity, over the last thirty years these programs have in fact become a means of preserving (and even deepening) the gulf between rich and poor in America (Price, 2004).

Model 5: Six-year graduation rate–all students. The fifth model examines how changes in environmental financial conditions and internal revenue structures affect an institution's six-year graduation rate. Significant findings from this model could aid administration in structuring revenue sources so as to increase the likelihood that the institution's students persisted until completion of a bachelor's degree. Findings may also increase understanding within the field as to how economic conditions and state financing mechanisms

affect student persistence. Such knowledge could inform public policy at both the state and national levels and support recently announced long-term goals to increase the percentage of young adults in the United States with a bachelor's degree.

The graduation rate–all students model had statistically insignificant F-values of 1.89 and 1.39, respectively, in the control and index model. However, the model was improved in the full iteration, resulting in a statistically significant F-value of 1.71 at the $p<.1$ level. Following both the second and the full iterations, a partial F-test was conducted on each block of added variables to determine if the effect of any of these variables was significant. The test revealed that the diversification indices were insignificant but the tuition dependence measures were significant at the $p<.1$ level. Regarding external variables, both measures of grant aid were significant but it is of note that the coefficients were in opposite directions. A one percent increase in the state need-based grant percentage reduced the graduation rate by 0.23 percent, while a one percent increase in the state non-need-based grant percentage increased the graduation rate by 0.27 percent. This phenomenon will be discussed in the following chapter. While diversification indices were insignificant, the tuition dependence measure for three years prior was significant at the $p<.05$. The effect was relatively small, however. A one percent increase in the percentage of total revenue from tuition in the third year prior increased the graduation rate by 0.08.

Thirty years ago, the United States ranked at the top of all nations in the percentage of young adults graduating from college. Since that time, graduation rates in other developed countries have advanced, while in America they have stagnated. As a result, the United States currently ranks near the bottom of 27 economically advanced countries in the percentage of students beginning college who subsequently graduate (Mortenson, 2009). President Obama has repeatedly called attention to the problem and set the goal for the percentage of young

Americans earning some form of college degree to reach 60 percent by 2020.

Student persistence to graduation is one of the most studied areas in higher education. A number of theoretical perspectives and empirical studies have been used to examine the factors promoting student degree completion. Tinto's (1975) model, which has generally been supported by subsequent research, stressed both individual and institutional forces, as well as the interaction of students within the collegiate environment. Student background factors (such as socioeconomic status, parental education levels, and community of residence) as well as individual attributes (such as high school grades, standardized test scores, and commitment/motivation) have all been shown to have statistically significant implications on degree completion.

However, given consistent individual characteristics, prior experiences, and commitments (factors over which institutions often have limited control), significant variation still exists in graduation rates across institutions. In a recent study, Hess, Schneider, Carey, and Kelley (2009) examined graduation rates at moderately selective universities that possessed similar student inputs in terms of SAT scores and high school placement. The top third of institutions had an average graduation rate of 62 percent, while the bottom third had an average graduation rate of 35 percent. The research suggests numerous institutional factors that promote student persistence, including increased instructional expenditures, effective pedagogy, quality advising, freshman seminars, and learning communities (Berger & Milem, 2000; Braxton, Jones, Hirschy, & Hartley, 2008; Gansemer-Topf, & Schuh, 2004; Ryan, 2004; Tinto, 1997). The use of many, small policy levers has been shown to be more effective at promoting student graduation than a single, large program (Bok, 2013; Braxton, Hirschy, & McClendon, 2004).

Tinto (1992) further argues that it is the individual's integration into the academic and

social systems of the institution that most directly affects his or her persistence to graduation. Insufficient interactions with others at the university (whether peers, faculty, or staff), or insufficient congruency with the prevailing value patterns of the university decrease persistence to graduation. While Tinto's theory was challenged when applied to commuter or online universities, empirical support was found when tested in residential universities (Braxton, Sullivan, and Johnson, 1997).

Events external to the college, such as opportunity cost and the availability of funding also have direct impacts on student graduation. St. John and Starkey (1995), DesJardins and Toutkoushian (2005), and Paulsen (2001a) present an economic approach to enrollment and persistence decisions whereby higher education is viewed as a student investment decision. Utilizing human capital theory (Becker, 1993), these authors maintain that the decision to leave college is no different than any other economic decision whereby the individual weighs the costs and benefits of alternative ways of investing their scare resources. When the financial return of additional years of education are not positive, students will drop out and graduation rates will decrease. Additional research of late has also examined the effect of financial policy on graduation rates and found positive effects of increased grant aid, particularly for low-income students (Chen & DesJardins, 2008; Paulsen & St. John, 2002; St. John, Cabrera, Nora, & Asker, 2000).

Model 6: Six-year graduation rate – White students. The sixth model examines how changes in environmental financial conditions and internal revenue structures affect an institution's six-year graduation rate specifically for White students, a class of students seldom studied directly. Significant findings from this model may illuminate those in the overall graduation rate model, providing insight into factors affecting the largest demographic in most

private institutions.

The graduation rate–White students model had statistically insignificant F-values of 1.20, 0.93, and 1.02, respectively, in the control, index, and full models. In the full model, the state non-need-based grant percentage had a significant positive effect ($p<.1$) as well as the tuition dependence measure from two years prior ($p<.1$). The F-test, however, suggests that such results are insignificant. Coefficients within the White student model closely mirror those of the model for all students, a logical finding since White students represent 61 percent of the student population in the United States (National Center for Education Statistics, 2013). Although few studies address White student persistence directly, it is generally assumed that factors shown to enhance overall graduation rate (see above) serve to benefit this large sub-class of students as well.

Model 7: Six-year graduation rate – Black students. The seventh model examines how changes in environmental financial conditions and internal revenue structures affect an institution's six-year graduation rate specifically for Black students, a historically underrepresented population. Prior research, discussed in Chapter Two and elaborated on below, has found that some forms of financial aid and other factors impact Black students differently than majority students. An increased understanding of the factors affecting the persistence of Black students is important in the field of higher education because of historic and current inequality in degree attainment.

The graduation rate model for Black students had statistically insignificant F-values of 2.05, 1.23, and 1.23 respectively, in the control, index, and full models. In the full model, the state need-based grant percentage had a significant negative effect ($p<.1$) while the state non-need-based grant percentage had a positive effect ($p<.05$). Such a finding provides some support

for the effectiveness of specifically directed, race-conscious financial aid in promoting degree completion in historically underrepresented populations.

For minority students, the ability to pay for college constitutes a "first-order concern" (Cibik and Chambers, 1991). Research has consistently shown that minority students demonstrate greater sensitively to both tuition and financial aid changes than do their White peers (Kaltenbaugh, St. John, & Starkey, 1999; St. John & Noell, 1989). St. John, Paulsen, and Carter (2005) found that greater percentages of Black students choose college and persist to graduation as a result of financial aid offers and low tuition. Black students have, on average, higher grants and loans, but lower tuition charges, meaning that these students had greater financial need but still could only afford to attend less expensive colleges. Recent reductions in grant aid and increases in tuition levels have thus had a disproportionate impact on Black students.

When these students perceive less of an ability to pay for their education, their sense of social integration may decline, resulting in a reduced sense of commitment to the institution, and an increased likelihood of premature departure (Braxton, Hirschy, & McClendon, 2004). Additional research has chronicled the struggle of minority students to socially integrate into universities possessing a different dominant culture (Kuh and Love, 2000). To experience social integration, students must join one more sub-groups, such as a fraternity or minority student association. If minority students are unable to find such groups, they often perceive that the potential for community does not exist. To increase persistence and graduation rates of minority students, Braxton, Hirschy, and McClendon (2004) recommend that universities embrace a diverse study body by enrolling a critical mass of minority students in order to increase the likelihood of cultural enclaves or affinity groups comprised of these students.

Model 8: Six-year graduation rate – Hispanic students. The eighth model examines how changes in environmental financial conditions and internal revenue structures affect an institution's six-year graduation rate specifically for Hispanic students, the fastest growing demographic in the United States. Prior research, discussed in Chapter Two and elaborated on below, has found that some forms of financial aid and other factors impact Hispanic students differently than majority students. An increased understanding of the factors affecting persistence in Hispanic students may illuminate efforts within the field to support these students and increase their persistence to a degree. Since the number of Hispanic students as a percent of the total population continues its upward trend, efforts to spur achievement in this population may yield significant benefits in achieving national degree completion goals.

The graduation rate model for Hispanic students had statistically insignificant F-values of 0.54, 1.00, and 0.81, respectively, in the control, index, and full models. Likewise, no individual factors were found to be significant in this model.

Dramatic changes in the ethnic makeup of the United States have occurred in recent decades and are projected to continue into the future. From 2000 to 2010, the number of public K-12 students of Hispanic descent increased 48 percent, from 7.7 million to 11.4 million. As a percentage of the total public K-12 student population, Hispanic students increased from 16 percent to 23 percent over the same time period (National Center for Educational Statistics, 2013). But while Hispanics are increasing as a percentage of the United States population, they lag behind every other major population group in higher education attainment. In 2012, the percentage of 25 to 29 year olds who had attained a Bachelor's degree or higher was 60 percent, 40 percent, 23 percent, and 15 percent for Asians, Whites, Blacks, and Hispanics, respectively (National Center for Educational Statistics, 2013).

The research suggests several factors leading to such a phenomenon. Due to both financial need and strong family attachment, Hispanic students are the most likely demographic to initially enroll at local two-year colleges, which have failed to serve in recent years as a gateway to a Bachelor's degree (Arbona & Nora, 2007). Additionally, Hispanic students are the most likely student group to be enrolled part-time, the most likely to prolong undergraduate education beyond the traditional age, and the least likely to resume studies after stopping out for one or more semesters (Arbona & Nora, 2007; Fry, 2002). Finally, compared to majority students, Hispanics more frequently perceived a hostile campus climate for diversity, which resulted in greater difficulty adjusting academically, socially, and emotionally as well as greater difficulty building a sense of attachment to the institution (Hurtado, Carter, & Spuler, 1996). As discussed previously, without such integration, graduation rates decline.

In order to achieve targeted goals of degree attainment, universities and public policy must support programs to increase degree completion within the Hispanic student population. Recent literature has examined a number of factors that promote Hispanic degree completion. Tinto's (1975) model has generally been supported when applied to Hispanic populations, although subsequent research has found unique weighting of factors for Hispanic students when compared to White or Black students. First, although student background characteristics are important, actual experiences in the collegiate environment play a more profound role for Hispanic students (Arbona & Nora, 2007; Hurtado & Ponjuan, 2005). Perhaps due to the emphasis upon family within Hispanic cultures, a strong sense of belonging at the institution and participation in support networks had stronger effects on degree attainment for Hispanic students than for other student populations (Hurtado & Carter, 1997; Hurtado & Ponjuan, 2005). Second, academic performance in the freshman year was found to be three times more important in

persistence to graduation for Hispanic students than its related effect on White students (Nora & Cabrera, 1996). Finally, family and peer support were shown to have significant positive effects. Hispanic students who lived on campus or with parents had higher graduation rates than students who lived off campus (Hurtado & Ponjuan 2005). Hispanic students possessing peers with similar educational goals also yielded higher graduation rates, suggesting the importance of peer influence in Hispanic culture. Such a finding suggests that an educational approach utilizing cohorts may have significant benefits for Hispanic students (Arbona & Nora, 2007).

Comparison of Results Across Models

In comparing these eight models, the most important environmental variable was the state non-need-based grant percentage. The state non-need-based grant percentage showed significance in seven of the eight models, with significant positive effects on both financial and educational outcomes. Greater non-need-based aid increased revenue, increased both total expenditures and instructional expenditures, reduced student indebtedness at matriculation, and increased three of the four graduation rates. In other words, new and expanded state programs of non-need-based aid (such as the Georgia Hope Scholarship or Florida Bright Futures program) significantly increased financial and educational outcomes at private universities in the study. In tough economic times, private universities may benefit by directing some resources toward lobbying for the maintenance of these programs.

As expected, the greatest influence of diversification indices and tuition dependence measures occurred in the revenue model and will be discussed in the next chapter. However, significant findings were also discovered in relation to instructional expenditures and the overall graduation rate. No significance was found related to total expenditures or the three graduation rates classified by ethnicity. Other factors are much better predictors of these outcomes.

Results of Specific Hypotheses

In this section, the results of the study in terms of each set of hypotheses is presented. A detailed discussion of these results is presented in Chapter Six.

Hypotheses 1a & 1b. Hypothesis 1a predicted that prior diversification indices would be negatively related to the year-over-year change in total revenue. Hypothesis 1b predicted that prior tuition dependence measures would be positively related to the year-over-year change in total revenue. The regression results for these hypotheses are presented in Table 10.

Table 10. Regression Results for Hypotheses 1a & 1b

Diversification indices ***	Index Model		Full Model	
1 year prior	5.685	***	-8.829	***
2 years prior	-0.507		-3.020	**
3 years prior	2.449	*	-1.218	
Tuition dependence measures ***				
1 year prior			1.938	***
2 years prior			0.244	**
3 years prior			0.321	***

*p<.1 **p<.05 ***p<.01

The two F-tests revealed that both the diversification indices and tuition dependence measures were significant as a block at the p<.01 level. Two of the three diversification indices were individually significant in the full model. Diversification indices for the one and two years prior were inversely predictive of year-over-year changes in total revenue. Each tuition dependence measures was individually significant and positively predictive of changes in total revenue. Based on this result, hypotheses 1a and 1b were supported.

Hypotheses 2a & 2b. Hypothesis 2a predicted that prior diversification indices would be negatively related to the year-over-year change in total expenditures. Hypothesis 2b predicted

that prior tuition dependence measures would be positively related to the year-over-year change in total expenditures. The regression results for these hypotheses are presented in Table 11.

Table 11. Regression Results for Hypotheses 2a & 2b

Diversification indices	Index Model	Full Model
1 year prior	0.038	-0.154
2 years prior	0.479	0.335
3 years prior	0.983	0.021
Tuition dependence measures		
1 year prior		0.009
2 years prior		0.020
3 years prior		0.130

*p<.1 **p<.05 ***p<.01

The two F-tests revealed that neither the diversification indices nor the tuition dependence measures were significant as a block. Additionally, none of the three diversification indices nor the three tuition dependence measures were individually significant. Thus, hypotheses 2a and 2b were not supported.

Hypotheses 3a & 3b. Hypothesis 3a predicted that prior diversification indices would be negatively related to the year-over-year change in instructional expenditures. Hypothesis 3b predicted that prior tuition dependence measures would be positively related to the year-over-year change in instructional expenditures. The regression results for these hypotheses are presented in Table 12.

Table 12. Regression Results for Hypotheses 3a & 3b

Diversification indices **	Index Model		Full Model	
1 year prior	0.527		1.788	
2 years prior	2.222	**	2.586	**
3 years prior	2.729	***	2.906	**
Tuition dependence measures				
1 year prior			-0.169	*
2 years prior			-0.043	
3 years prior			-0.009	

*p<.1 **p<.05 ***p<.01

The first F-test revealed that the diversification indices were significant as a block at the p<.05 level. The diversification indices from two and three years prior were predictive of the change in instructional expenditures. However, the result was in the opposite direction from what was hypothesized. Institutions that reduced their diversification indices (by increasing diversification) were actually more likely to see a reduction in year-over-year instructional expenditures, a finding discussed in the next chapter. Although the tuition dependence measure from one year prior was individually marginally significant, the second F-test revealed that tuition dependence measures were insignificant as a block. Therefore, hypotheses 3a and 3b were not supported.

Hypotheses 4a & 4b. Hypothesis 4a predicted that prior diversification indices would be positively related to the percentage of incoming students accepting loans. Hypothesis 4b predicted that prior tuition dependence measures would be positively related to the percentage of incoming students accepting loans. The regression results for these hypotheses are presented in Table 13.

Table 13. Regression Results for Hypotheses 4a & 4b

Diversification indices	Index Model	Full Model
1 year prior	0.789	1.092
2 years prior	-0.335	-0.606
3 years prior	0.694	0.898
Tuition dependence measures		
1 year prior		-0.043
2 years prior		0.043
3 years prior		-0.022

*p<.1 **p<.05 ***p<.01

The two F-tests revealed that neither the diversification indices nor the tuition dependence measures were significant as a block. Additionally, none of the three diversification indices nor the three tuition dependence measures were individually significant. Thus, hypotheses 4a and 4b were not supported.

Hypotheses 5a & 5b. Hypothesis 5a predicted that prior diversification indices would be negatively related to the overall graduation rate. Hypothesis 5b predicted that prior tuition dependence measures would be negatively related to the overall graduation rate. The regression results for these hypotheses are presented in Table 14.

Table 14. Regression Results for Hypotheses 5a & 5b

Diversification indices	Index Model	Full Model
1 year prior	-0.411	-0.405
2 years prior	0.108	-0.320
3 years prior	0.311	-0.313
*Tuition dependence measures **		
1 year prior		-0.015
2 years prior		0.061
3 years prior		0.082 **

*p<.1 **p<.05 ***p<.01

The first F-test revealed that diversification indices were not significant as a block. Thus, hypothesis 5a was not supported. The second F-test revealed that tuition dependence measures were significant as a block at the p<.1 level. The tuition dependence measure from three years prior was individually statistically significant but the result was in the opposite direction from what was hypothesized. Institutions that increased their tuition dependence were more likely to see slight increases in overall graduation rate. Therefore, hypothesis 5b was not supported.

Hypotheses 6a & 6b. Hypothesis 6a predicted that prior diversification indices would be negatively related to the graduation rate of White students. Hypothesis 6b predicted that prior tuition dependence measures would be negatively related to the graduation rate of White students. The regression results for these hypotheses are presented in Table 15.

Table 15. Regression Results for Hypotheses 6a & 6b

Diversification indices	Index Model	Full Model
1 year prior	0.050	-0.223
2 years prior	0.566	-0.034
3 years prior	0.329	-0.107
Tuition dependence measures		
1 year prior		0.022
2 years prior		0.083 *
3 years prior		0.053

*p<.1 **p<.05 ***p<.01

The first F-test revealed that diversification indices were insignificant as a block. Although the tuition dependence measure from two years prior was individually significant at the p<.05 level, the second F-test revealed that tuition dependence measures were also insignificant as a block. Thus, hypotheses 6a and 6b were not supported.

Hypotheses 7a & 7b. Hypothesis 7a predicted that prior diversification indices would be negatively related to the graduation rate of Black students. Hypothesis 7b predicted that prior tuition dependence measures would be negatively related to the graduation rate of Black students. The regression results for these hypotheses are presented in Table 16.

Table 16. Regression Results for Hypotheses 7a & 7b

Diversification indices	Index Model	Full Model
1 year prior	0.576	1.850
2 years prior	0.499	1.403
3 years prior	0.170	0.083
Tuition dependence measures		
1 year prior		-0.155
2 years prior		-0.120
3 years prior		0.027

*p<.1 **p<.05 ***p<.01

The two F-tests revealed that neither the diversification indices nor the tuition dependence measures were significant as a block. Additionally, none of the three diversification indices nor the three tuition dependence measures were individually significant. Thus, hypotheses 7a and 7b were not supported.

Hypotheses 8a & 8b. Hypothesis 8a predicted that prior diversification indices would be negatively related to the graduation rate of Hispanic students. Hypothesis 8b predicted that prior tuition dependence measures would be negatively related to the graduation rate of Hispanic students. The regression results for these hypotheses are presented in Table 17.

Table 17. Regression Results for Hypotheses 8a & 8b

Diversification indices	Index Model	Full Model
1 year prior	1.795	1.264
2 years prior	-1.147	-0.879
3 years prior	-1.368	-1.694
Tuition dependence measures		
1 year prior		0.088
2 years prior		-0.048
3 years prior		0.034

*p<.1 **p<.05 ***p<.01

The two F-tests revealed that neither the diversification indices nor the tuition dependence measures were significant as a block. Additionally, none of the three diversification indices nor the three tuition dependence measures were individually significant. Thus, hypotheses 8a and 8b were not supported.

Summary

The purpose of this chapter was to report and interpret the results of the regression analyses. First, two summary tables of regression analyses were presented that reported regression coefficients, significance levels, and F-scores for the control, index, and full models. Following the tables, the eight regression models were discussed in terms of what was found in each step. Finally, the results associated with each hypothesis were presented indentifying where significant relationships existed between the two types of predictor variables and each of the eight financial and educational outcome measures.

Although no significance was found in the three models examining graduation rates by ethnicity, the other five models showed significance–the three financial models and the student indebtedness model at the p<.01 level, and the overall graduation rate model at the p<.1 level. In the total expenditure model and the student indebtedness model, significance was limited to the

policy and context variables. Institutions with greater revenue diversification do not perform better or worse on these outcomes than those with more concentrated revenue. However, these models revealed that the state wealth and financing mechanisms for higher education have significant effects on private university outcomes. Increases in either form of state financial aid decreased student indebtedness at matriculation, while increasing non-need-based aid increased total expenditures per FTE student. Changes in state financial aid policy had significant effects across multiple models, including total revenue per FTE student, instructional expenditures per FTE student, and the overall graduation rate.

Significant effects of the diversification indices and the tuition dependence measures were limited to three models: revenue per FTE student, instructional expenditures per FTE student, and overall graduation rate. In the overall graduation rate model, an increase in tuition dependence for the third year prior resulted in a minor increase in student degree completion. The effect was only 0.08 percent, but was in the opposite direction of what was hypothesized.

The effect of revenue diversification upon instructional expenditures was also opposite of what was hypothesized. It was theorized that private Bachelor's and Master's universities, which place a primary emphasis on student instruction would see less goal displacement with greater revenue diversification and, therefore, be able to allocate increased funds to teaching. However, as diversification increased, instructional expenditures per FTE student decreased significantly. It is notable that there was no effect on total expenditures per FTE student as diversification increased. One may reasonably conclude that when private universities increase their revenue diversification, they are often shifting funds–perhaps unintentionally–from instruction to other functions, such as fundraising or auxiliary operations.

The most significant finding related to the effect of revenue diversification and tuition

dependence was upon total revenue per FTE student. Drawing from portfolio theory, it was hypothesized that greater diversification would increase year-over-year revenue per FTE student. It was also theorized that increasing the component of total revenue derived from tuition would increase year-over-year revenue per FTE student, since tuition is the least volatile and most controllable funding source. The data support both of these hypotheses.

Chapter Six

Discussion and Conclusion

The purpose of this study was to investigate the possible effects of revenue diversification upon eight financial and educational outcomes in private universities after controlling for particular changes in the state policies and institutional context. Revenue diversification indices and tuition dependence measures for each of the three years prior to observation were utilized as predictors. This chapter provides commentary on the results presented in Chapter Five in light of the theories developed in Chapter Two and Three. The discussion is centered upon key findings related to two topical groupings: 1) policy and context and 2) internal revenue diversification. Following the discussion of the results, the implications for practice and the limitations of the study are presented. Finally, opportunities for future research will be discussed followed by an overall conclusion of the study.

Policy and Context Variables

The study utilized four environmental variables primarily in order to account for changes in the institutional context that, according to theory and prior research literature, may affect the outcome variables under examination. The most significant environmental variable was undoubtedly the state's average non-need-based grant as a percentage of average public tuition. This measure, coupled with the related need-based grant measure, provides a sense of how individual state financing policies support students.

Legislators have two main alternatives when funding higher education in their states.

Historically, the method they have employed most often is to provide state appropriations directly to publicly-controlled institutions. Often referred to as the low-tuition, low-aid model, public institutions charge relatively little in tuition and fees but the amount of additional financial aid provided to students is minimal. Indirect subsidies are provided to all students enrolled at public institutions, even those who do not need financial assistance; but, students who chose private institutions are effectively left out of the subsidization pool. States such as Arizona, Idaho, and Utah have implemented such an approach.

Alternatively, states can provide lower appropriations to public institutions and instead provide a greater amount of direct aid to students, either based on need or non-need. States allow these funds to be utilized at the accredited college or university selected by the student, even if the institution is privately-controlled. Tuition at public institutions often increases due to the reduced appropriations, although it is argued that need-based aid, if applied efficiently, can effectively reduce the financial burden for low-income students. States such as Minnesota, Pennsylvania, and New Jersey have implemented such an approach.

Although significant research has documented the challenges of the high-tuition, high-aid model for low-income and minority students, this study suggests that the latter approach is the most beneficial for private institutions. Current and potential students at private universities benefit from the increased opportunities for financial aid and the price differential between public and private institutions is reduced.

Grant funding–both need-based and non-need-based–varies significantly across states. Table 18 displays the three-year trend for the average need-based grant as a percentage of average public tuition for the ten states with the most generous proportions of need-based aid as

well as the sample average. Table 19 displays the same three-year trend related to non-need-based grants.

Table 18. Average Need-based Grant as a Percentage of Average Public Tuition, Top 10 States

State	2008	2009	2010
North Carolina	15.09	19.59	18.00
New York	19.24	18.85	17.92
Washington	17.58	17.22	14.81
New Jersey	9.81	9.67	10.35
Texas	10.32	8.40	9.84
West Virginia	9.27	10.37	9.60
Indiana	12.10	11.95	9.44
California	11.04	10.14	9.31
Oklahoma	9.36	9.65	9.23
Minnesota	8.68	7.74	8.37
Sample Average	7.94	7.70	6.86

Table 19. Average Non-need-based Grant as a Percentage of Average Public Tuition, Top 10 States

State	2008	2009	2010
Georgia	54.65	54.11	49.70
Florida	23.91	23.68	18.14
Louisiana	18.58	18.70	17.32
Tennessee	17.26	18.17	17.09
South Carolina	18.06	16.96	15.28
New Mexico	13.69	14.51	12.70
West Virginia	12.87	13.67	12.32
Nevada	12.11	11.79	9.24
Kentucky	8.56	8.10	7.31
North Carolina	4.11	4.13	3.50
Sample Average	4.05	4.02	3.49

In the model examining student indebtedness at matriculation, a decrease in the state need-based grant percentage was found to significantly increase the number of incoming freshman who were forced to withdraw loans, a logical finding. For each one percent decrease in the proportion of public tuition cost provided by need-based aid, initial student indebtedness increased 0.81 percent.

More remarkably, the study revealed the significant consequences of the annual reductions in the proportion of educational cost provided by state non-need-based aid upon private university outcomes. As this measure declined, revenue per FTE student, total expenditures per FTE student, instructional expenditures per FTE student, and the overall graduation rate declined. The negative effect on degree completion resulting from reduced non-need-based aid was largest among Black students, suggesting that the benefits of non-need-based aid programs are not limited to economically privileged, majority students but can serve as a

vehicle for promoting minority student success at institutions that often possess much less diversity than the population at large. Likewise, student indebtedness at matriculation increased as the state non-need-based aid percentage declined. Of all the variables in the study, it could easily be argued that state non-need-based aid was most significant to the outcomes of private universities.

Table 20 provides the estimated consequences of reductions in state non-need-based aid during 2010 to private institutions located in the ten states with the most generous proportions of non-need-based aid, as well as an estimate based on the sample average. The calculation is made by multiplying each state's change in the non-need-based grant measure from 2009 to 2010 by the regression effect within each model. The effect upon Hispanic graduation rate was insignificant and was therefore excluded from the table.

Table 20. Estimated Effects of the 2010 Reduction in the Average Non-need-based Grant as a Percentage of Average Public Tuition, Top 10 States

State	Total Revenue per student	Total Expenditures per student	Instructional Expenditures per student	Student Indebtedness	Grad Rate All Students	Grad Rate White	Grad Rate Black
Georgia	-5.5%	-6.5%	-5.2%	2.5%	-1.2%	-2.0%	-4.3%
Florida	-6.9%	-8.2%	-6.6%	3.1%	-1.5%	-2.5%	-5.4%
Louisiana	-1.7%	-2.0%	-1.6%	0.8%	-0.4%	-0.6%	-1.3%
Tennessee	-1.3%	-1.6%	-1.3%	0.6%	-0.3%	-0.5%	-1.1%
South Carolina	-2.1%	-2.5%	-2.0%	0.9%	-0.4%	-0.7%	-1.6%
New Mexico	-2.3%	-2.7%	-2.2%	1.0%	-0.5%	-0.8%	-1.8%
West Virginia	-1.7%	-2.0%	-1.6%	0.8%	-0.4%	-0.6%	-1.3%
Nevada	-3.2%	-3.8%	-3.0%	1.4%	-0.7%	-1.1%	-2.5%
Kentucky	-1.0%	-1.2%	-0.9%	0.4%	-0.2%	-0.4%	-0.8%
North Carolina	-0.8%	-0.9%	-0.7%	0.4%	-0.2%	-0.3%	-0.6%
Sample Average	-0.7%	-0.8%	-0.6%	0.3%	-0.1%	-0.2%	-0.5%

If the percentages above were applied to average revenue per FTE student in each state, the model estimates that the average private institution in Georgia and Florida would experience, on average, $1,281 and $1,477 less revenue per FTE student in 2010. While changes in financial aid programs based on need had similar effects (including the greatest effect on initial student indebtedness), the majority of private university outcomes were most sensitive to changes in non-need-based aid.

A number of takeaways from the above analysis should be noted. First, non-need-based financial aid was one area used by many state legislators to balance state budgets during economically challenging times. Although these programs were shown to have significant benefits to private universities, prioritizing such programs in economically challenging times may prove politically challenging when competing demands for public funding are deemed to be more pressing. Nevertheless, the study provides affirmative support for private institutions and related consortia that lobby state legislatures to maintain or expand non-need-based financial aid programs. Second, the data suggest that private institutions are, on the whole, good stewards of the non-need-based aid received by their students, utilizing the funds to increase instructional expenditures, reduce students' debt loads, and increase student completion. While private institutional finances are clearly strengthened by increases in non-need-based aid at the state level, educational outcomes and societal benefits increase as well.

Internal Revenue Diversification

The primary purpose of this study was to examine whether increasing revenue diversification impacted the financial and education outcomes of private universities. Although there was no prior study of this type in the field of higher education, a number of theories and prior research in the management literature suggested that revenue diversification was beneficial

for reducing both volatility (portfolio theory) and goal displacement (resource dependence theory). A form of the Hirschman-Herfindahl Index (HHI) was utilized in order to measure the diversification of revenue among five mutually-exclusive sources (tuition, governmental, private, endowment income, and auxiliary/affiliate). Additionally, due to the relative stability of tuition revenue and its low likelihood to produce goal displacement, tuition dependence measures were added to the model. Although revenue diversification had no effect on the educational outcomes as operationalized in the study, significant findings were found in both the revenue and instructional expenditures model.

First, regarding revenue, both the diversification indices and tuition dependence measures had significant effects. As institutional revenue became more diversified, total revenue per FTE student increased. A 0.1 unit decrease in the prior year's diversification index (an improvement in institutional diversification) resulted in an 8.83 percent increase in total revenue per FTE student. A 0.1 unit decrease in the diversification index from two years prior resulted in a 3.02 percent increase in total revenue per FTE student. At the same time, the tuition dependence measures suggested that institutions solidified their revenue during economically challenging periods as they increased the relative proportion that was derived from tuition. A one percent increase in the proportion of total revenue from tuition in the one, two, and three years prior resulted in total revenue per FTE student increases of 1.94 percent, 0.24 percent, and 0.32 percent, respectively.

To aid in the interpretation of these results, the 2006–2010 revenue distributions and diversification indices for a hypothetical private institution (ABC University) are displayed in Table 21.

Table 21. Revenue Diversification at ABC University

	Components of Total Revenue by Percentage					
Year	Tuition	Governmental	Private	Endowment Income	Auxliary & Affiliate	Diversification Index
2006	0.200	0.100	0.500	0.000	0.200	0.340
2007	0.230	0.100	0.440	0.010	0.220	0.305
2008	0.260	0.100	0.380	0.020	0.240	0.280
2009	0.290	0.100	0.320	0.030	0.260	0.265
2010	0.320	0.100	0.260	0.040	0.280	0.260

In this illustration, ABC University increased its revenue diversification by reducing its dependence upon revenue from private sources by 6 percent each year. In its place, the University increased the components of total revenue from endowment income (1 percent per year), auxiliary/affiliate (2 percent per year), and tuition (3 percent per year). As a result, the institution's diversification index declined from 0.340 to 0.260 over the five year period.

If one were to use the regression models to predict the effect of ABC University's revenue diversification on 2010 outcomes, the models' coefficients for one, two, and three years prior would be applied to changes in ABC's diversification indices and tuition dependence measures for 2009, 2008, and 2007, respectively. Table 22 applies the results of the revenue regression model to variations in these predictors in order to estimate the effect of such changes on total revenue per FTE student in 2010.

Table 22. Estimated Effect of Revenue Diversification upon 2010 Revenue per Student at ABC University

	Diversification Indices			Tuition Dependence Measures		
Period	Change	Coefficient*	Effect	Change	Coefficient**	Effect
1 Year Prior	-0.015	-8.829	0.013	0.03	1.938	0.058
2 Years Prior	-0.025	-3.020	0.008	0.03	0.244	0.007
3 Years Prior		Statistically Insignificant		0.03	0.321	0.010
			0.021			0.075
Cumulative	0.096	or 9.6%				

* For each 0.1 increase in the diversification index

** For each 1.0 percent increase in the tuition dependence measure

By becoming more diversified and increasing tuition dependence in each year, ABC University is estimated to experience an additional 9.6 percent increase in total revenue per FTE student in 2010 than had the University consistently maintained its more concentrated revenue structure in the base year of 2006. The University benefited from both increased diversification and increased tuition dependence. The impact of such an effect on university funding is sizeable. For institutions in the sample, 2010 revenue per FTE student was $25,900 while average enrollment was 2,580. A 9.6 percent increase represents an additional $2,485 in total revenue per FTE student, yielding an increase in total revenue of approximately $6.4 million. Because many of the institutions in the sample are small and operate on very thin margins, the effect of such revenue dollars could very well mean the difference between survival and cessation during tough economic periods.

Second, regarding instructional expenditures, only the diversification indices in the two and three years prior had significant effects. A 0.1 unit decrease in the diversification index from two years prior resulted in a 2.59 percent decrease in instructional expenditures per FTE student. A 0.1 unit decrease in the diversification index from three years prior resulted in a 2.91 percent decrease in instructional expenditures per FTE student. Table 23 applies the results of the instructional expenditures regression model to variations in these predictors for ABC University

in order to estimate the effect of diversification changes on instructional expenditures per FTE student in 2010.

Table 23. Estimated Effect of Revenue Diversification upon 2010 Instructional Expenditures per Student at ABC University

	Diversification Indices			Tuition Dependence Measures		
Period	Change	Coefficient*	Effect	Change	Coefficient**	Effect
1 Year Prior		Statistically Insignificant			Statistically Insignificant	
2 Years Prior	-0.025	2.586	-0.006		Statistically Insignificant	
3 Years Prior	-0.035	2.906	-0.010		Statistically Insignificant	
			-0.017			
Cumulative	-0.017	or -1.7%				

* For each 0.1 increase in the diversification index

** For each 1.0 percent increase in the tuition dependence measure

By becoming more diversified, ABC University is estimated to experience 1.7 percent less instructional expenditures per FTE student in 2010 than had the University consistently maintained its more concentrated revenue structure in the base year of 2006. Although it was hypothesized that increasing diversification would reduce goal displacement and allow institutions in the study to direct funds toward their primary mission of teaching, pursuit of new revenue streams appears to have required a shifting of funds away from instruction. It is noteworthy that total expenditures per FTE student did not significantly change as revenue diversification changed (model #2), but significant reductions occurred in instructional expenditures per FTE student. In the hypothetical case of ABC University, it may be the case that institutional efforts to increase endowment income and auxiliary/affiliate revenue brought with them expenditure commitments that necessitated a reduction of faculty raises or reduced faculty headcount.

The impact of such an effect on university funding is sizeable. For institutions in the sample, 2010 instructional expenditures per FTE student were $17,980 while average enrollment was 2,580. A 1.7 percent decrease represents a $306 reduction in instructional expenditures per

FTE student, yielding a decrease in total instructional expenditures of approximately $790,000 at the average institution. In many sampled institutions, this shortfall equates to the combined annual salaries of ten or more faculty members.

Despite significant findings in the financial models, revenue diversification did not have an impact upon the educational outcomes as operationalized. Two possible rationales may enlighten this finding. First, other than unrestricted endowment funds, all revenue sources have some deliverables that the institution is responsible for providing. For example, receipt of a governmental grant requires completion of agreed upon procedures. Development of auxiliary enterprises such as dormitories or dining halls necessitates additional non-instructional personnel. Little research presently exists examining the relative commitment required of major revenue sources in the higher education sector. Because these commitments vary and are often uncertain, the use of revenue diversification with the purpose of increasing educational outcomes may be challenging. Alternatively, it is possible that financial outcomes are intermediate and ultimately effect student outcomes in later periods. In other words, increasing revenue diversification in 2014 may increase total revenue in 2017, which would then promote increased degree completion in 2022. Although this is untested in the present study, opportunities for additional research on these relationships are discussed below.

Implications for Future Practice

A number of findings from this study are useful for informing both administrative practice and public policy. First, the significance of state non-need-based aid programs on the financial and educational outcomes of private universities was revealed. Changes in the cost of education provided to students through state non-need-based aid programs had significant effects on all but one outcome in the study. As detailed in Chapter Two, public support of higher

education has declined significantly over the past 30 years. Budget shortfalls, competing priorities, and a shift in the perception of who derives the primary benefit from higher education has led many states to reduce their public funding of higher education. However, as higher education has become more privatized, some states have shifted funding directly to students in order to allow their citizens to select the institution which best serves their individual needs. All colleges and universities then compete for these students (and funds) in a market-based system, in which, institutions are held accountable to deliver a quality education or risk losing enrollment. Private institutions and related consortia should embrace such shifts and actively lobby for the expansion of such approaches to funding. Unfortunately, sizeable non-need-based aid programs are uncommon across the United States. In 2010, thirty-three states provided less than one percent of the public tuition cost in non-need-based aid. Thirteen states provided no non-need-based aid.

To promote such public policy, private institutions should regularly advance arguments–supported by empirical studies–regarding the effectiveness of such non-need-based aid programs in reducing the demand on public universities, promoting social mobility, and serving as economically-wise public investments. Documenting the success of non-need-based aid programs in states like Florida, Georgia, and Tennessee may also prove to be an effective policy lever. Likewise, private institutions should promote and embrace stringent accreditation policies that ensure that institutions not effectively serving students or the public interest are disqualified from receiving such funding. A negative public perception of the relative increase in inferior and often predatory institutions, as well as the low career placement and high loan default rates of their graduates (and dropouts), has been cited as one reason for cautious financial aid policies at the state and federal levels. Although this presents a tall order during troubling economic times,

the benefits of state financial aid, and non-need-based aid in particular, for private universities are significant. From a public policy viewpoint, the present study affirms that increasing state non-need-based aid programs yields significant public benefits to citizens attending private institutions. These benefits include higher graduation rates, lower indebtedness, and greater instructional expenditures per FTE student. In light of this, legislators should be less quick to view non-need-based aid funding as the most dispensable class of expenditure during recessionary periods.

Second, the study provides tactical insights to private university stakeholders regarding strategic financing in economically challenging periods. Previous higher education research failed to evaluate revenue diversification in terms of its two main rationales: reducing both volatility and goal displacement. In the present study, it was hypothesized that revenue diversification would reduce the consequences of excessive reliance upon any one source, providing greater stability in annual revenue and reducing goal displacement vis-à-vis the institution's mission. The findings suggest that revenue stability is increased but goal displacement may not be improved.

Institutions that successfully diversified their revenue portfolios experienced greater increases in revenue per FTE student. This supports the argument that administrators should continually evaluate the concentration of institutional revenue and address excessive reliance upon any one source. For example, sampled institutions that historically drew a high proportion of annual revenue from private sources (gifts, grants, or contracts) found themselves in peril when economic conditions become dire. In 2006, 29 institutions in the study relied upon private sources for over forty percent of their annual revenue. As market conditions became dire in 2009, each institution experienced a decline in the proportion of total revenue provided by these

private sources. The proportion of total revenue provided by private sources at these institutions declined by an average of 23.3 percent from 2006 to 2009. In 2009, only 4 of the 29 institutions drew forty percent or more of their revenue from private sources. It could be suggested that these institutions anticipated such conditions and intentionally diversified in order to solidify financing. However, 21 of these 29 institutions experienced a decline in inflation-adjusted revenue per FTE student across the three-year period. In constant dollars, the average revenue per FTE student at these institutions declined 23.5 percent from $37,570 in 2006 to $28,754 in 2009.

Similar results could occur in the future as key financing sources are challenged. Should institutions become increasingly reliant upon any single source of revenue, diversification initiatives should be considered so that volatility can be minimized when individual sources are threatened. Despite the counterbalancing arguments regarding student affordability and other consequences of tuition increases that were detailed in Chapter Two, administrators must also understand the unique nature of tuition. The study suggests that increasing institutional reliance upon tuition dollars provides greater stability in securing funding during financially troubling times. Reducing reliance upon dominant sources of revenue *and* solidifying enrollment so as to increase tuition revenue may thus be the key strategic combination that could enable many private institutions to survive–and even thrive–during challenging economic periods.

Finally, the greatest caution that the study provides relates to the link between institutional financing and mission. Drawing from resource dependence theory, it was hypothesized that increasing revenue diversification would reduce external control over operations allowing the college or university to more effectively achieve its mission. However, as diversification was increased, instructional expenditures per FTE student declined. Since the

primary focus of institutions within the study is undergraduate education, a significant reduction in instructional expenditures represents a challenge to institutional mission. The study suggests that pursuit of new revenue sources may lead to expenditure commitments that force private colleges and universities to redirect funds. Administrators (and faculty involved in shared governance) should cautiously monitor the effect that the pursuit of new revenue sources has on the resources available for instruction and any other mission-related activities. Regardless of the amount of funds that may be generated, any financing strategy should be viewed in the full light of its effect on the mission and stakeholders of the institution.

Study Limitations

While this study has filled a gap in the literature regarding revenue diversification and related university outcomes, it is not without its limitations. A first potential shortcoming arises due to the time period under study. Observations regarding the institutional outcomes were intentionally derived from the years 2008–2010, the three worst economic years in recent memory. The analysis of these years was an intelligible choice given the grave financial difficulty that many private institutions faced during this period and the historic challenges to traditional revenue sources that were documented in Chapter Two. Consequently, results should be interpreted within the economic context in which they occurred. Institutions shifting revenue structures during peak market years may experience differing results.

A second potential shortcoming of the study centers on the operationalizations of particular variables. For example, the incoming student indebtedness model utilizes the percentage of incoming students who borrow to finance first-year schooling as its outcome variable. While providing a glimpse into student debt burden, this measure fails to account for subsequent indebtedness, both in the number of continuing students who go into debt and,

perhaps more importantly, student loan balance upon graduation. It is not hard to conceptualize an institution that offers generous financial aid in a student's first year in order to entice enrollment but then fails to extend equivalent aid past the first or second year. Initial indebtedness at the aforementioned institution would be relatively low; however, as financial aid is removed in subsequent years, student indebtedness (and likely student departure) may increase dramatically. Based on the available indebtedness measure, the aforementioned institution appears better than institutions that structure financial aid to support students throughout their progression to a degree. An improved measure would be the percentage of students graduating with student loans or the average student loan balance of graduates, but such data was unavailable at the institutional level. A society in which 80 percent of graduates have marginal student loans is likely more desirable than one in which 40 percent of graduates have student loans greater than $100,000. Until such data is available at the institution level, such an analysis cannot be conducted.

Additionally, the annual revenue and the diversification indices used in the study were derived using an estimate of endowment income. As previously discussed, the available revenue data report investment earnings that include unrealized endowment gains and losses. However, institutions annually draw only a portion of the average endowment value for operational expenditures rather than the net change in investment balance. Endowment income was estimated using five-percent of the rolling three-year average endowment value. Although this estimate is reasonable for the sector as a whole, institutional practices do vary. Such an operationalization will not recognize an institution that, in order to sustain operations in a given year, increased its endowment payout rate. In the present operationalization, any effect of such a strategic financing change upon total expenditures per FTE student, instructional expenditures

per FTE student, or other potential outcomes will not be captured.

A third limitation in the study is the limited testing of potential time-sensitive relationships between variables. For each outcome variable, diversification indices and tuition dependence measures in the one, two, and three years prior to observation served as predictors. Environmental variables were those of the observation year. It is quite possible that shifts in revenue diversification four or more years prior, if measured, would have significant effects on the study's outcomes. Limitations on the availability of historic endowment values precluded inclusion of these measures. Likewise, changes in the external environment may have a lag effect on outcome variables, particularly for expenditures per student, student indebtedness, and graduation rates. Inclusion of environmental variables, particularly state per capita income and state financial aid, for years prior to observation may have produced significant effects.

Finally, the study was limited to institutions classified as private Bachelor's and Master's institutions per recent Carnegie classification. A similar study could be conducted on public institutions or more complex research universities with similar or differing results. Generalizations of these results to dissimilar institutions such as community colleges or tier-1 research universities is discouraged. Likewise, although the institutions in the study are primarily teaching-focused, significant variation exists within institutions in terms of size, wealth, selectivity, and complexity. More precise results may be found if the models are analyzed exclusively for the most elite, wealthy liberal arts colleges only, or for less selective institutions with far fewer financial resources.

Opportunities for Future Research

As is often the case in new areas of academic inquiry, a research project may raise as many or more questions than it answers. Such is the situation with this study, which was

intentionally designed to understand the breadth of the phenomenon since so little research in the field was available on which to build. The study revealed significant findings regarding the effect of state financial aid policies and revenue diversification, yet much more work remains to be done to understand more fully the linkages between the variables in the study, as well as other consequences of revenue diversification.

The first obvious step concerns analysis of financial and educational outcomes over a longer period of time, including periods in which economic markets were favorable. The study intentionally focused on three years in which the United States faced historically poor economic conditions. Analysis over a similarly lengthy period of economic expansion would be a good comparison study. Each of the traditional revenue sources likely respond differently in peak economic times. Contrary to what occurred in the Great Recession, in a growing economy charitable giving and endowment income may well increase while tuition revenue may decrease for many institutions, as increased employment opportunities raise the opportunity cost of additional years of education for current and potential students. If such is the case, increased revenue diversification whereby institutions reduce their tuition dependence and increase the proportion of funds from other sources may be shown to have even more beneficial effects than this study suggests. Further, analysis over a longer period of time, such as an entire decade, would provide more concrete data regarding the long-term effects of revenue diversification. Such a time period would most likely include both bull and bear financial markets. Although the present study's findings suggest effective responses for colleges and universities faced with troubling times, a study examining a decade or more of data could provide more insights that would enable university administrators to develop long-term financing strategies.

Secondly, the study's methodology could be utilized to conduct additional research on

student debt burden, a growing concern in the field of higher education. As previously discussed, the study utilized a variable detailing the percentage of first-time, full-time students that accepted debt upon initial matriculation. However, no existing data at the institutional level provides information regarding the percentage of students who graduate with debt or the average amount of debt accumulated. Additionally, no data at the institutional level is available regarding debt burdens incurred by part-time students or by students who do not persist until degree completion. Recent research by The Institute for College Access and Success has begun to analyze such data. These metrics, if obtained via new surveys or by existing research centers, would provide a much better analysis for how environmental factors, revenue diversification, tuition dependence, and/or a host of other variables affect the debt burden on today's students.

Third, further examination of the relationships between variables in the study across time may provide additional significant findings. Each model was analyzed using environmental variables in the year of observation, revenue diversification indices in the three prior years, and tuition dependence measures in the three prior years. It is highly likely that environmental variables in preceding years could have significant effects on the study's outcomes. For example, state need-based and non-need-based grant measures in 2008 could have positive effects on 2010 instructional expenditures per student and graduation rates. Likewise, a reduction of tuition dependence in 2006 may have positive effects on the six-year graduation rate in 2010. As additional longitudinal data becomes available, such a study could be effectively conducted. Significant findings from such an analysis would aid in understanding the long-term implications of prior periods' economic, public policy, and institutional revenue changes beyond those identified in the present study.

A fourth area of further study would examine revenue diversification in other sectors of

higher education. The distribution of revenue at two-year community colleges, publicly-funded four-year universities, and research universities frequently differs from that at the private Bachelor's and Master's institutions in the present study. Government funding, which has experienced such significant challenges in recent years, typically represents a much greater component of total revenue for the former institutions. Additionally, research universities often have significant sources of revenue from grant funding, athletics, and auxiliary operations such as hospitals and business ventures. The effects of revenue diversification may differ significantly at these institutions. A focused study on any of these sectors could fill this knowledge gap.

A fifth area for further research is an additional examination of the potential consequences of revenue diversification and/or the pursuit of alternative revenue sources. The present study found that institutions that became more diversified experienced significant declines in instructional expenditures per student. Since these institutions focus on teaching, such an outcome is undesirable and potentially affects the ability of the institutions to fulfill their missions. Said another way, a restructuring of revenue in such a way that nontraditional sources are pursued often carries with it the risk of expenditure commitments that can shift funds or displace institutional goals. Variables such as student-teacher ratios and the percentage of full-time employees who serve in administrative functions could be examined. Additional exploration of the prevalence and consequences of such effects are needed to gain a better understanding of the full effects of revenue diversification.

Finally, should all this research be conducted and all the benefits and shortcomings of revenue diversification be discovered, additional administrative knowledge is still needed regarding *how* to diversify. For example, what timeline should institutions develop for

effectively rolling out a revenue diversification initiative? What are the specific auxiliary revenue sources that are most effective for various types of institutions? What staffing requirements are necessary in order to meet the administrative and regulatory requirements arising from a restructured revenue portfolio? A qualitative study of 5–10 institutions that have recently undergone a successful diversification initiative could go a long way towards providing a template for college and university administrators seeking to solidify their operations through revenue diversification.

Conclusion

This study explored the effects of revenue diversification upon the financial and educational outcomes of private Bachelor's and Master's universities during the most challenging economic period in recent history. Utilizing empirical research and theoretical lenses from both the management and higher education disciplines, historical measures of revenue diversification and tuition dependence were identified as possible predictors for eight institutional outcomes. The results indicated that revenue diversification is an effective strategy for solidifying institutional revenue but also cautioned against expenditure commitments and goal displacement that may arise as a result of diversification initiatives. Additionally, the importance of non-need-based aid to multiple financial and educational outcomes was discovered. Revenue diversification was found to have no significant effect on student indebtedness at matriculation or graduation rates, but significant findings may be discovered as future research examines the effects beyond a three-year time frame and/or utilizes other variable operationalizations.

This study concluded by addressing how administrators and public policy-makers might use these results from their unique stakeholder perspective, and how researchers might frame

future inquiry in this emerging area. In summary, this study represents a valuable contribution to our understanding of higher education financing strategies at the state level and revenue diversification at the institutional level. As colleges and universities continue to seek new revenue sources and external stakeholders continue to demand greater accountability, additional research in this area will provide the necessary knowledge allowing policy-makers and administrators to strategically structure higher education financing so as to meet the needs of diverse stakeholders and to allow individual institutions to meet their specific, mission-related objectives.

Appendix A - Trend Data for Major Revenue Sources, by Carnegie Classification (select years)

Revenues per FTE student (in 2010 dollars)

										2010 Change			
Public Associate's	**Revenues per FTE student**	**1990**	**2000**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**1-year**	**5-year**	**10-year**	**20-year**
	Net tuition	$1,691	$2,320	$2,853	$2,924	$3,021	$3,027	$3,137	$3,270	$134	$417	$950	$1,579
	State/local appropriations	$6,734	$6,892	$6,207	$6,662	$6,950	$7,166	$6,696	$5,700	($996)	($508)	($1,192)	($1,035)
	Federal appropriations, grants, and contracts	$1,087	$1,594	$1,727	$1,779	$1,837	$1,892	$1,948	$1,818	($130)	$91	$224	$731
	Auxiliary enterprises, hospitals, and other sources	$1,146	$1,286	$1,255	$1,272	$1,271	$1,322	$1,271	$1,330	$59	$75	$44	$185
	Gifts, investment returns, and endowment income	$133	$210	$231	$290	$371	$283	$170	$152	($18)	($79)	($58)	$19
	Total Revenue ($)	**$10,791**	**$12,303**	**$12,274**	**$12,928**	**$13,449**	**$13,689**	**$13,222**	**$12,270**	**($951)**	**($3)**	**($32)**	**$1,480**
	Percentage of Total Revenues	**1990**	**2000**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**1-year**	**5-year**	**10-year**	**20-year**
	Net tuition	15.7%	18.9%	23.2%	22.6%	22.5%	22.1%	23.7%	26.7%	2.9%	3.4%	7.8%	11.0%
	State/local appropriations	62.4%	56.0%	50.6%	51.5%	51.7%	52.3%	50.6%	46.5%	-4.2%	-4.1%	-9.6%	-16.0%
	Federal appropriations, grants, and contracts	10.1%	13.0%	14.1%	13.8%	13.7%	13.8%	14.7%	14.8%	0.1%	0.7%	1.9%	4.7%
	Auxiliary enterprises, hospitals, and other sources	10.6%	10.5%	10.2%	9.8%	9.4%	9.7%	9.6%	10.8%	1.2%	0.6%	0.4%	0.2%
	Gifts, investment returns, and endowment income	1.2%	1.7%	1.9%	2.2%	2.8%	2.1%	1.3%	1.2%	0.0%	-0.6%	-0.5%	0.0%
	Total Revenue (%)	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

										2010 Change			
Public Bachelor's	**Revenues per FTE student**	**1990**	**2000**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**1-year**	**5-year**	**10-year**	**20-year**
	Net tuition	$2,529	$3,561	$4,721	$4,970	$5,113	$5,238	$5,414	$5,672	$258	$951	$2,111	$3,143
	State/local appropriations	$7,691	$7,888	$6,679	$6,990	$7,578	$7,741	$7,374	$6,406	($968)	($273)	($1,482)	($1,285)
	Federal appropriations, grants, and contracts	$957	$1,640	$2,222	$2,281	$2,259	$2,339	$2,313	$2,563	$250	$342	$923	$1,607
	Auxiliary enterprises, hospitals, and other sources	$2,711	$3,279	$3,400	$3,468	$3,663	$3,714	$3,784	$3,920	$136	$520	$641	$1,210
	Gifts, investment returns, and endowment income	$363	$578	$583	$632	$794	$635	$365	$634	$269	$50	$55	$271
	Total Revenue ($)	**$14,251**	**$16,947**	**$17,605**	**$18,341**	**$19,407**	**$19,667**	**$19,250**	**$19,196**	**($55)**	**$1,591**	**$2,249**	**$4,945**
	Percentage of Total Revenues	**1990**	**2000**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**1-year**	**5-year**	**10-year**	**20-year**
	Net tuition	17.7%	21.0%	26.8%	27.1%	26.3%	26.6%	28.1%	29.5%	1.4%	2.7%	8.5%	11.8%
	State/local appropriations	54.0%	46.5%	37.9%	38.1%	39.0%	39.4%	38.3%	33.4%	-4.9%	-4.6%	-13.2%	-20.6%
	Federal appropriations, grants, and contracts	6.7%	9.7%	12.6%	12.4%	11.6%	11.9%	12.0%	13.4%	1.3%	0.7%	3.7%	6.6%
	Auxiliary enterprises, hospitals, and other sources	19.0%	19.3%	19.3%	18.9%	18.9%	18.9%	19.7%	20.4%	0.8%	1.1%	1.1%	1.4%
	Gifts, investment returns, and endowment income	2.5%	3.4%	3.3%	3.4%	4.1%	3.2%	1.9%	3.3%	1.4%	0.0%	-0.1%	0.8%
	Total Revenue (%)	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

										2010 Change			
Public Master's	**Revenues per FTE student**	**1990**	**2000**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**1-year**	**5-year**	**10-year**	**20-year**
	Net tuition	$2,883	$4,124	$5,381	$5,515	$5,641	$5,760	$5,975	$6,369	$395	$988	$2,245	$3,486
	State/local appropriations	$7,662	$7,663	$6,441	$6,637	$6,829	$7,065	$6,479	$5,859	($620)	($582)	($1,804)	($1,804)
	Federal appropriations, grants, and contracts	$994	$1,586	$1,919	$1,983	$2,016	$2,063	$1,989	$2,162	$173	$242	$576	$1,168
	Auxiliary enterprises, hospitals, and other sources	$2,582	$3,289	$3,369	$3,235	$3,351	$3,336	$3,576	$3,734	$158	$365	$445	$1,151
	Gifts, investment returns, and endowment income	$262	$460	$363	$460	$620	$447	$275	$362	$87	($1)	($99)	$100
	Total Revenue ($)	**$14,384**	**$17,122**	**$17,473**	**$17,831**	**$18,457**	**$18,670**	**$18,293**	**$18,486**	**$193**	**$1,012**	**$1,364**	**$4,101**
	Percentage of Total Revenues	**1990**	**2000**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**1-year**	**5-year**	**10-year**	**20-year**
	Net tuition	20.0%	24.1%	30.8%	30.9%	30.6%	30.9%	32.7%	34.5%	1.8%	3.7%	10.4%	14.4%
	State/local appropriations	53.3%	44.8%	36.9%	37.2%	37.0%	37.8%	35.4%	31.7%	-3.7%	-5.2%	-13.1%	-21.6%
	Federal appropriations, grants, and contracts	6.9%	9.3%	11.0%	11.1%	10.9%	11.0%	10.9%	11.7%	0.8%	0.7%	2.4%	4.8%
	Auxiliary enterprises, hospitals, and other sources	18.0%	19.2%	19.3%	18.1%	18.2%	17.9%	19.5%	20.2%	0.6%	0.9%	1.0%	2.2%
	Gifts, investment returns, and endowment income	1.8%	2.7%	2.1%	2.6%	3.4%	2.4%	1.5%	2.0%	0.5%	-0.1%	-0.7%	0.1%
	Total Revenue (%)	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

										2010 Change			
Public Research	**Revenues per FTE student**	**1990**	**2000**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**1-year**	**5-year**	**10-year**	**20-year**
	Net tuition	$3,921	$5,455	$7,096	$7,367	$7,552	$7,715	$8,085	$8,586	$502	$1,490	$3,131	$4,665
	State/local appropriations	$10,970	$10,688	$9,003	$9,266	$9,597	$9,772	$8,954	$8,132	($822)	($870)	($2,556)	($2,838)
	Federal appropriations, grants, and contracts	$3,838	$5,256	$8,077	$8,047	$8,014	$7,939	$8,179	$8,389	$210	$312	$3,133	$4,551
	Auxiliary enterprises, hospitals, and other sources	$7,624	$9,208	$9,819	$10,056	$10,381	$10,736	$11,173	$11,469	$296	$1,651	$2,262	$3,846
	Gifts, investment returns, and endowment income	$1,557	$2,366	$2,212	$2,402	$3,355	$1,588	-$369	$2,307	$2,676	$95	($59)	$749
	Total Revenue ($)	**$27,910**	**$32,973**	**$36,206**	**$37,137**	**$38,899**	**$37,751**	**$36,022**	**$38,884**	**$2,861**	**$2,678**	**$5,910**	**$10,974**
	Percentage of Total Revenues	**1990**	**2000**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**1-year**	**5-year**	**10-year**	**20-year**
	Net tuition	14.0%	16.5%	19.6%	19.8%	19.4%	20.4%	22.4%	22.1%	-0.4%	2.5%	5.5%	8.0%
	State/local appropriations	39.3%	32.4%	24.9%	24.9%	24.7%	25.9%	24.9%	20.9%	-3.9%	-4.0%	-11.5%	-18.4%
	Federal appropriations, grants, and contracts	13.8%	15.9%	22.3%	21.7%	20.6%	21.0%	22.7%	21.6%	-1.1%	-0.7%	5.6%	7.8%
	Auxiliary enterprises, hospitals, and other sources	27.3%	27.9%	27.1%	27.1%	26.7%	28.4%	31.0%	29.5%	-1.5%	2.4%	1.6%	2.2%
	Gifts, investment returns, and endowment income	5.6%	7.2%	6.1%	6.5%	8.6%	4.2%	-1.0%	5.9%	7.0%	-0.2%	-1.2%	0.4%
	Total Revenue (%)	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

										2010 Change			
Private Bachelor's	**Revenues per FTE student**	**1990**	**2000**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**1-year**	**5-year**	**10-year**	**20-year**
	Net tuition	$9,723	$11,673	$13,106	$13,240	$13,649	$13,913	$14,310	$14,479	$169	$1,373	$2,806	$4,755
	State/local appropriations	$577	$412	$333	$443	$471	$556	$523	$439	($84)	$106	$27	($138)
	Federal appropriations, grants, and contracts	$1,372	$1,444	$1,398	$1,322	$1,265	$1,175	$1,225	$1,277	$52	($121)	($167)	($95)
	Auxiliary enterprises, hospitals, and other sources	$5,503	$6,251	$6,226	$6,280	$6,420	$6,326	$6,305	$6,493	$187	$266	$242	$989
	Gifts, investment returns, and endowment income	$4,998	$17,272	$12,447	$14,324	$20,700	$5,732	-$8,728	$12,046	$20,775	($401)	($5,225)	$7,048
	Total Revenue ($)	**$22,174**	**$37,052**	**$33,510**	**$35,609**	**$42,504**	**$27,702**	**$13,635**	**$34,734**	**$21,099**	**$1,224**	**($2,318)**	**$12,560**
	Percentage of Total Revenues	**1990**	**2000**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**1-year**	**5-year**	**10-year**	**20-year**
	Net tuition	43.9%	31.5%	39.1%	37.2%	32.1%	50.2%	105.0%	41.7%	-63.3%	2.6%	10.2%	-2.2%
	State/local appropriations	2.6%	1.1%	1.0%	1.2%	1.1%	2.0%	3.8%	1.3%	-2.6%	0.3%	0.2%	-1.3%
	Federal appropriations, grants, and contracts	6.2%	3.9%	4.2%	3.7%	3.0%	4.2%	9.0%	3.7%	-5.3%	-0.5%	-0.2%	-2.5%
	Auxiliary enterprises, hospitals, and other sources	24.8%	16.9%	18.6%	17.6%	15.1%	22.8%	46.2%	18.7%	-27.6%	0.1%	1.8%	-6.1%
	Gifts, investment returns, and endowment income	22.5%	46.6%	37.1%	40.2%	48.7%	20.7%	-64.0%	34.7%	98.7%	-2.5%	-11.9%	12.1%
	Total Revenue (%)	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

										2010 Change			
Private Master's	**Revenues per FTE student**	**1990**	**2000**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**1-year**	**5-year**	**10-year**	**20-year**
	Net tuition	$9,775	$12,285	$13,806	$13,918	$14,315	$14,379	$14,901	$15,149	$248	$1,342	$2,864	$5,374
	State/local appropriations	$647	$537	$413	$378	$348	$366	$361	$288	($74)	($125)	($249)	($359)
	Federal appropriations, grants, and contracts	$1,111	$989	$986	$956	$895	$849	$891	$905	$14	($81)	($83)	($206)
	Auxiliary enterprises, hospitals, and other sources	$3,762	$3,858	$3,957	$4,179	$4,186	$4,026	$4,082	$4,031	($51)	$74	$173	$269
	Gifts, investment returns, and endowment income	$2,192	$5,579	$4,224	$4,570	$5,821	$2,596	-$1,303	$3,534	$4,837	($690)	($2,045)	$1,342
	Total Revenue ($)	**$17,487**	**$23,248**	**$23,387**	**$24,002**	**$25,566**	**$22,217**	**$18,933**	**$23,907**	**$4,975**	**$520**	**$659**	**$6,420**
	Percentage of Total Revenues	**1990**	**2000**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**1-year**	**5-year**	**10-year**	**20-year**
	Net tuition	55.9%	52.8%	59.0%	58.0%	56.0%	64.7%	78.7%	63.4%	-15.3%	4.3%	10.5%	7.5%
	State/local appropriations	3.7%	2.3%	1.8%	1.6%	1.4%	1.6%	1.9%	1.2%	-0.7%	-0.6%	-1.1%	-2.5%
	Federal appropriations, grants, and contracts	6.4%	4.3%	4.2%	4.0%	3.5%	3.8%	4.7%	3.8%	-0.9%	-0.4%	-0.5%	-2.6%
	Auxiliary enterprises, hospitals, and other sources	21.5%	16.6%	16.9%	17.4%	16.4%	18.1%	21.6%	16.9%	-4.7%	-0.1%	0.3%	-4.7%
	Gifts, investment returns, and endowment income	12.5%	24.0%	18.1%	19.0%	22.8%	11.7%	-6.9%	14.8%	21.7%	-3.3%	-9.2%	2.2%
	Total Revenue (%)	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

										2010 Change			
Private Research	**Revenues per FTE student**	**1990**	**2000**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**1-year**	**5-year**	**10-year**	**20-year**
	Net tuition	$14,318	$17,545	$19,338	$19,365	$20,047	$20,342	$20,638	$20,799	$161	$1,461	$3,254	$6,481
	State/local appropriations	$976	$513	$689	$754	$790	$833	$707	$623	($85)	($67)	$110	($353)
	Federal appropriations, grants, and contracts	$8,367	$9,443	$12,485	$12,060	$11,648	$11,454	$11,485	$11,919	$434	($566)	$2,476	$3,552
	Auxiliary enterprises, hospitals, and other sources	$17,456	$18,799	$21,332	$21,800	$23,046	$23,646	$22,709	$23,443	$734	$2,111	$4,644	$5,987
	Gifts, investment returns, and endowment income	$7,534	$46,640	$31,735	$34,575	$47,262	$15,996	-$30,756	$24,462	$55,218	($7,273)	($22,178)	$16,928
	Total Revenue ($)	**$48,651**	**$92,941**	**$85,579**	**$88,554**	**$102,793**	**$72,271**	**$24,783**	**$81,246**	**$56,463**	**($4,333)**	**($11,695)**	**$32,594**
	Percentage of Total Revenues	**1990**	**2000**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**1-year**	**5-year**	**10-year**	**20-year**
	Net tuition	29.4%	18.9%	22.6%	21.9%	19.5%	28.1%	83.3%	25.6%	-57.7%	3.0%	6.7%	-3.8%
	State/local appropriations	2.0%	0.6%	0.8%	0.9%	0.8%	1.2%	2.9%	0.8%	-2.1%	0.0%	0.2%	-1.2%
	Federal appropriations, grants, and contracts	17.2%	10.2%	14.6%	13.6%	11.3%	15.8%	46.3%	14.7%	-31.7%	0.1%	4.5%	-2.5%
	Auxiliary enterprises, hospitals, and other sources	35.9%	20.2%	24.9%	24.6%	22.4%	32.7%	91.6%	28.9%	-62.8%	3.9%	8.6%	-7.0%
	Gifts, investment returns, and endowment income	15.5%	50.2%	37.1%	39.0%	46.0%	22.1%	-124.1%	30.1%	154.2%	-7.0%	-20.1%	14.6%
	Total Revenue (%)	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Source: Delta Cost Project IPEDS database, 24-year matched set.

Appendix B
Distribution of Predictor Variables by Quintile with Outcomes

One Year Prior Diversification Index

Observation	Quentile	Index	Revenue	Total Expenditures	Instructional Expenditures	Student Indebtedness	Overall Graduation Rate
2008	**1st**	0.283	-0.92	-0.85	-1.60	62.05	61.53
	2nd	0.340	0.40	0.38	1.23	67.88	56.31
	3rd	0.407	-2.98	0.02	-0.47	70.42	57.04
	4th	0.485	-1.14	1.22	1.95	70.20	52.84
	5th	0.655	-0.19	-0.32	-1.04	65.17	45.57
	Average	0.434	-0.98	0.09	0.02	67.15	54.81
2009	**1st**	0.284	-2.86	0.94	0.61	60.26	62.37
	2nd	0.343	-2.30	2.29	1.39	67.09	57.95
	3rd	0.411	0.18	1.35	3.15	70.85	54.63
	4th	0.492	0.86	1.55	2.66	71.64	54.20
	5th	0.663	2.40	2.09	3.23	65.19	45.72
	Average	0.438	-0.37	1.64	2.20	67.00	55.10
2010	**1st**	0.290	1.56	-2.52	-1.82	64.33	61.48
	2nd	0.357	-2.45	-2.98	-1.76	70.40	56.88
	3rd	0.433	0.30	-2.53	-2.58	72.46	55.87
	4th	0.513	0.26	-2.12	-2.01	74.19	53.76
	5th	0.687	2.81	-0.99	-2.29	67.27	45.59
	Average	0.456	0.48	-2.24	-2.09	69.75	54.83

Two Years Prior Diversification Index

Observation	Quentile	Index	Revenue	Total Expenditures	Instructional Expenditures	Student Indebtedness	Overall Graduation Rate
2008	**1st**	0.282	-1.25	-0.86	-1.45	61.18	62.06
	2nd	0.340	-0.50	-0.74	0.85	69.05	56.01
	3rd	0.403	-0.36	1.45	0.69	70.61	55.69
	4th	0.481	-1.55	1.05	0.30	70.29	54.23
	5th	0.651	-1.21	-0.44	-0.28	64.74	45.17
	Average	0.431	-0.98	0.09	0.02	67.15	54.81
2009	**1st**	0.283	-1.16	2.34	1.77	60.84	60.59
	2nd	0.340	-2.88	0.57	0.27	67.20	57.63
	3rd	0.407	1.17	2.14	3.40	70.66	55.90
	4th	0.485	-1.23	0.49	2.07	70.62	54.32
	5th	0.655	2.38	2.71	3.54	65.65	46.32
	Average	0.443	-0.37	1.64	2.20	67.00	55.10
2010	**1st**	0.284	0.19	-3.21	-2.15	63.05	62.49
	2nd	0.343	0.76	-2.34	-1.63	70.22	56.23
	3rd	0.411	-0.78	-2.29	-2.61	74.25	54.49
	4th	0.492	0.08	-2.53	-1.94	73.97	53.62
	5th	0.663	2.24	-0.75	-2.11	67.28	46.81
	Average	0.438	0.48	-2.24	-2.09	69.75	54.83

Three Years Prior Diversification Index

Observation	Quentile	Index	Revenue	Total Expenditures	Instructional Expenditures	Student Indebtedness	Overall Graduation Rate
2008	**1st**	0.284	-1.15	-0.35	-0.69	60.52	63.39
	2nd	0.342	-1.09	-0.34	-0.17	70.86	54.71
	3rd	0.406	-0.54	1.36	0.77	70.21	55.85
	4th	0.486	-1.08	0.68	1.25	70.34	54.79
	5th	0.657	-1.03	-0.94	-1.11	63.98	44.29
	Average	0.435	-0.98	0.09	0.02	67.15	54.81
2009	**1st**	0.282	-1.28	1.52	0.78	59.94	61.02
	2nd	0.340	-2.30	1.75	1.32	68.12	56.69
	3rd	0.403	0.44	1.30	3.70	70.98	56.07
	4th	0.481	-0.49	1.67	2.51	70.45	54.92
	5th	0.651	1.85	1.96	2.72	65.75	45.94
	Average	0.431	-0.37	1.64	2.20	67.00	55.10
2010	**1st**	0.283	1.43	-2.29	-1.29	64.01	60.39
	2nd	0.340	-1.35	-3.66	-2.70	70.02	56.55
	3rd	0.407	-0.48	-2.14	-2.49	73.50	55.92
	4th	0.485	1.40	-2.07	-2.46	72.29	53.64
	5th	0.655	1.43	-1.00	-1.51	68.89	47.02
	Average	0.434	0.48	-2.24	-2.09	69.75	54.83

One Year Prior Tuition Dependence Measure

Observation	Quentile	Index	Revenue	Total Expenditures	Instructional Expenditures	Student Indebtedness	Overall Graduation Rate
2008	**1st**	78.89	-0.04	-0.19	-0.57	65.66	45.90
	2nd	64.89	-0.76	-0.03	-0.26	70.21	53.62
	3rd	55.28	-0.67	0.21	0.11	71.50	57.48
	4th	45.03	-0.46	0.15	-0.11	68.32	56.80
	5th	29.36	-2.94	0.31	0.93	59.55	59.85
	Average	54.72	-0.98	0.09	0.02	67.15	54.81
2009	**1st**	79.43	3.04	2.50	3.27	66.32	45.38
	2nd	65.80	1.64	1.90	2.62	71.60	55.04
	3rd	56.44	1.62	1.97	2.69	69.61	56.63
	4th	46.09	-3.62	0.31	0.79	67.66	58.57
	5th	30.34	-4.43	1.55	1.66	59.82	59.36
	Average	55.65	-0.37	1.64	2.20	67.00	55.10
2010	**1st**	81.23	3.17	-0.95	-1.96	68.35	46.37
	2nd	67.81	0.93	-2.05	-2.16	74.20	54.65
	3rd	59.29	0.75	-1.94	-2.00	71.99	56.56
	4th	48.64	-0.77	-2.05	-1.23	71.47	58.05
	5th	32.07	-1.62	-4.18	-3.11	62.47	58.09
	Average	57.84	0.48	-2.24	-2.09	69.75	54.83

Two Years Prior Tuition Dependence Measure

Observation	Quentile	Index	Revenue	Total Expenditures	Instructional Expenditures	Student Indebtedness	Overall Graduation Rate
2008	**1st**	78.61	-1.00	0.01	0.29	66.18	45.48
	2nd	64.56	-1.96	-0.11	-1.02	69.71	55.31
	3rd	54.98	1.47	1.30	0.85	70.59	58.30
	4th	45.06	-3.43	-0.56	-1.27	69.39	55.62
	5th	29.72	0.11	-0.17	1.31	59.73	58.72
	Average	54.62	-0.98	0.09	0.02	67.15	54.81
2009	**1st**	78.89	2.47	2.96	3.32	65.85	46.52
	2nd	64.89	-0.01	1.52	2.99	71.59	54.26
	3rd	55.28	0.02	1.48	2.02	70.53	57.41
	4th	45.03	-2.00	0.45	0.72	68.44	57.74
	5th	29.36	-2.24	1.83	1.98	58.08	59.10
	Average	54.72	-0.37	1.64	2.20	67.00	55.10
2010	**1st**	79.43	2.59	-0.54	-2.04	68.76	46.54
	2nd	65.80	0.18	-2.28	-1.67	74.12	54.25
	3rd	56.44	-1.08	-2.57	-2.32	72.92	56.75
	4th	46.09	1.96	-0.53	-0.18	69.74	57.61
	5th	30.34	-1.19	-5.27	-4.26	63.15	58.60
	Average	55.65	0.48	-2.24	-2.09	69.75	54.83

Three Years Prior Tuition Dependence Measure

Observation	Quentile	Index	Revenue	Total Expenditures	Instructional Expenditures	Student Indebtedness	Overall Graduation Rate
2008	**1st**	79.06	-0.58	-0.20	-0.29	64.98	45.38
	2nd	65.14	-1.92	0.17	0.31	70.30	54.24
	3rd	55.61	-1.17	0.64	-0.55	70.76	58.41
	4th	46.06	-0.57	-0.28	-0.71	68.16	58.05
	5th	30.35	-0.61	0.12	1.37	61.11	57.33
	Average	55.28	-0.98	0.09	0.02	67.15	54.81
2009	**1st**	78.61	2.16	2.62	2.56	67.01	46.20
	2nd	64.56	1.04	2.24	3.65	70.01	55.58
	3rd	54.98	-1.74	0.27	1.73	69.78	58.99
	4th	45.06	-0.82	1.77	1.51	68.42	56.43
	5th	29.72	-2.43	1.32	1.55	59.65	57.60
	Average	54.62	-0.37	1.64	2.20	67.00	55.10
2010	**1st**	78.89	1.92	-0.79	-1.54	68.99	47.55
	2nd	64.89	1.59	-1.87	-2.00	73.62	53.52
	3rd	55.28	-1.58	-2.70	-2.48	72.83	57.16
	4th	45.03	1.43	-1.55	-1.57	71.11	57.15
	5th	29.36	-0.93	-4.27	-2.86	61.74	58.42
	Average	54.72	0.48	-2.24	-2.09	69.75	54.83

References

Abrams, B. A., & Schitz, M. D. (1978). The "crowding-out" effect of governmental transfers on private charitable contributions. *Public Choice, 33*(1), 29–39.

Adams, C., & Perlmutter, F. (1991). Commercial venturing and the transformation of America's voluntary social welfare agencies. *Nonprofit and Voluntary Sector Quarterly*, *20*(1), 25–38.

Adnett, N. (2006). Student finance and widening participation in the British isles: Common problems, different solutions. *Higher Education Quarterly*, *60*(4), 296–311.

Akers, B., Chingos, M., & Henriques, A. (2013). Is a student loan crisis on the horizon? Understanding changes in the distribution of student loan debt over time. The Brookings Institution. Retrieved from http://www.upjohn.org/stuloanconf/Akers_Chingos_ Henriques.pdf

Alexander, F. K. (2003). Comparative study of state tax effort and the role of federal government policy in shaping revenue reliance patterns. *New Directions for Higher Education, 119*, 13–26.

Alfred, R. L. (2006). *Managing the big picture in colleges and universities: From tactics to strategy*. Westport, CT: Praeger.

Allen, I. E., & Seaman, J. (2010). Learning on demand: Online education in the United States. Retrieved from http://www.sloan-c.org/publications/survey/pdf/learningondemand.pdf

Allen, J. (2002, July 31). Colleges bulk up spending on stadiums–race for more fan dollars and recruits incites building of grander spaces. *Wall Street Journal*, p. B6.

American Association of University Professors. (2010). *No refuge: The annual report on the economic status of the profession, 2009–2010*. Retrieved from

http://www.aaup.org/AAUP/comm/rep/Z/ecstatreport09-10/

American Association of University Professors. (2012). *A very slow recovery: The annual report on the economic status of the profession, 2011–2012*. Retrieved from http://www.aaup.org/file/2011-12Economic-Status-Report.pdf

Andreoni, J., & Payne, A. (2003). Do government grants to private charities crowd out giving or fund-raising? *The American Economic Review, 93*(3), 792–812.

Andreoni, J., & Payne, A. (2010). *Is crowding out due entirely to fundraising? Evidence from a panel of charities* (Working Paper No. w16372). Cambridge, MA: National Bureau of Economic Research.

Arai, K. (1998). *The economics of education: An analysis of college-going behavior*. New York, NY: Springer-Verlag.

Arbona, C., & Nora, A. (2007). The influence of academic and environmental factors on Hispanic college degree attainment. *The Review of Higher Education*, *30*(3), 247–269.

Archibald, R. B., & Feldman, D. H. (2006). State higher education spending and the tax revolt. *Journal of Higher Education*, *77*(4), 618–644.

Avery, C., & Kane, T. J. (2004). Student perceptions of college opportunities: The Boston COACH program. In C. Hoxby (Ed.). *College choices: The economics of where to go, when to go, and how to pay for it* (pp. 355–394). Chicago, IL: University of Chicago Press.

Baade, R. A., & Sundberg, J. O. (1996). What determines alumni generosity? *Economics of Education Review*, *15*(1), 75–81.

Barton, N., & Gose, B. (2010). Smaller nonprofit endowments outperformed large ones in 2009, Chronicle survey finds. *The Chronicle of Philanthropy*, *22*(12).

Baum, S. (2001). College education: Who can afford it? In M. B. Paulsen & J. C. Smart. (Eds.). *The finance of higher education: Theory, research, policy, and practice* (pp. 39–52). Edison, NJ: Agathon Press.

Baum, S., Ma, J., & Payea, K. (2010). Education pays 2010: The benefits of higher education for individuals and society. *The College Board*. Retrieved from http://trends.collegeboard. org/files/Education_Pays_2010.pdf

Becker, G. S. (1993). *Human capital: A theoretical and empirical analysis with special reference to education*. Chicago, IL: The University of Chicago Press.

Behrman, J. R. (1997). Conceptual and measurement issues. In J. Behrman and N. Stacy (Eds.). *The societal benefits of higher education* (pp. 17-68). Ann Arbor, MI: University of Michigan Press.

Berger, J. B., & Milem, J. F. (2000). Organizational behavior in higher education and student outcomes. In J. Smart (Ed.), *Higher education: Handbook of theory and research* (pp. 268–338). New York, NY: Agathon.

Bernstein, S. R. (1991). Contracted services: Issues for the nonprofit agency manager. *Nonprofit and Voluntary Sector Quarterly*, *20*(4), 429–443.

Bianco, A., & Rupani, S. (2007, November 29). The dangerous wealth of the ivy league. *Business Week.*

Biddison, G., & Hier, T. (1998). Wringing dollars out of campus space. *Facilities Manager*, *14*(6), 18–23.

Bielefeld, W. (1992). Funding uncertainty and nonprofit strategies in the 1980s. *Nonprofit Management & Leadership*, *2*(4), 381–401.

Bielefeld, W. (1994). What affects nonprofit survival? *Nonprofit Management & Leadership*,

5(1), 19–36.

Bloustein, E. J. (1990). How much tuition should state universities charge? *Planning for Higher Education*, *18*(3), 3–6.

Blumenstyk, G. (2003). Auxiliary services: Colleges look for more revenue. *The Chronicle of Higher Education*, *50*(17), A12.

Blumenstyk, G. (2004). Colleges seek a record number of patents. *The Chronicle of Higher Education*, *51*(15), A27.

Bluemenstyk, G. (2009). Market collapse weighs heavily on college endowments. *The Chronicle of Higher Education*, *55*(22), A17.

Boatman, A., & L'Orange, H. (2006). State tuition, fees, and financial assistance policies for public colleges and universities, 2005–06. *State Higher Education Executive Officers report*. Retrieved from http://www.sheeo.org/finance/tuitionfee06.pdf

Bok, D. (2003). *Universities in the marketplace: The commercialization of higher education*. Princeton, NJ: Princeton University Press.

Bok, D. (2013). *Higher education in America.* Princeton, NJ: Princeton University Press.

Borgaza, C., & Defourny, J. (Eds.). (2001). *The emergence of social enterprise*. New York, NY: Routledge.

Boris, E. T., & Odendahl, T. J. (1990). Ethical issues in fund raising and philanthropy. In J. van Til (Ed.), *Critical issues in American philanthropy* (pp. 188–203). San Francisco, CA: Jossey-Bass.

Boston Consulting Group. (2013). *Maintaining momentum in a complex world: Global wealth 2013.* Retrieved from https://www.bcgperspectives.com/.

Bowen, H. H. (1980). *The costs of higher education: How much colleges and universities spend*

per student and how much should they spend? San Francisco, CA: Jossey-Bass.

Braxton, J. M. (2000). *Reworking the student departure puzzle*. Nashville, TN: Vanderbilt University Press.

Braxton, J. M., Hirschy, A. S., & McClendon, S. A. (2004). *Understanding and reducing college student departure*. ASHE-ERIC Higher Education Report, *30*(3). San Francisco, CA: Jossey-Bass.

Braxton, J. M., Jones, W. A., Hirschy, A. S., & Hartley, H. (2008). The role of active learning in college student persistence. *New Directions for Teaching and Learning*, *115*, 71–83.

Braxton, J. M., Sullivan, A.S., & Johnson, R. (1997). Appraising Tinto's theory of college student departure. In J. Smart (Ed.), *Higher education: Handbook of theory and research* (pp. 107–164). New York, NY: Agathon.

Breneman, D. W. (2002). For colleges, this is not just another recession. *The Chronicle of Higher Education*, *48*(40), B7–B9.

Breneman, D. W., Doti, J. L., & Lapovski, L. (2001). Financing private colleges and universities: The role of tuition discounting. In M. B. Paulsen & J. C. Smart (Eds.), *The finance of higher education: Theory, research, policy, and practice* (pp. 461–479). New York, NY: Agathon Press.

Breneman, D. W., & Finn, C. E. (1978). *Public policy and private higher education*. Washington, DC: The Brookings Institution.

Breneman, D. W., & Finney, J. E. (1997). The changing landscape: Higher education finance in the 1990s. In P. M. Callan & J. E. Finney (Eds.), *Public and private financing of higher education: Shaping public policy for the future* (pp. 30–59). Phoenix, AZ: Oryx Press.

Brightman, R. W. (1989). Entrepreneurship in the community college: Revenue diversification.

New Directions for Community Colleges, *68*, 57–66.

Brooks, A. (1999). Do public subsidies leverage private philanthropy for the arts? Empirical evidence on symphony orchestras. *Nonprofit and Voluntary Sector Quarterly*, *28*(1), 32–45.

Brooks, A. (2000a). Is there a dark side to government support for nonprofits? *Public Administration Review*, *60*(3), 211–218.

Brooks, A. (2000b). Public subsidies and charitable giving: Crowding out, crowding in, or both? *Journal of Policy Analysis and Management*, *19*(3), 451–464.

Brooks, A. (2003). Do government subsidies to nonprofits crowd out donations or donors? *Public Finance Review*, *31*(2), 166–179.

Browning, E. K., & Browning, J. M. (1994). *Public finance and the price system*. Englewood Cliffs, NJ: Prentice-Hall.

Bush, R. (1992). Survival of the nonprofit spirit in a for-profit world. *Nonprofit and Voluntary Sector Quarterly*, *21*(4), 391–410.

Cabrera, A. F., Terenzini, P. T., & Bernal, E. M. (2000). *Leveling the playing field: Low-income students in postsecondary education*. Washington, DC: The College Board.

Callan, P. M. (2002). Coping with recession: Public policy, economic downturns and higher education. *National Center for Public Policy and Higher Education*. Retrieved from http://www.highereducation.org/reports/cwrecession/cwrecession.shtml

Callan, P. M., & Finney, J. E. (Eds.). (1997). *Public and private financing of higher education: Shaping public policy for the future*. Phoenix, AZ: American Council on Education/Oryx Press.

Campbell, T. I. D., & Slaughter, S. (1999). Faculty and administrators' attitudes toward

potential conflicts of interest, commitment, and equity in university-industry relationships. *The Journal of Higher Education*, *70*(3), 309–352.

Carnevale, D. (2003). Some colleges add ads to their websites. *The Chronicle of Higher Education*, *49*(33), A31–A32.

Carroll, D. A., & Stater, K. J. (2008). Revenue diversification in nonprofit organizations: Does it lead to financial stability? *Journal of Public Administration Research and Theory*, *19*(4), 947–966.

Chang, C., & Tuckman, H. (1994). Revenue diversification among nonprofits. *Annals of Public and Cooperative Economics*, *5*(3), 273–290.

Chen, R., & DesJardins, S. L. (2008). Exploring the effects of financial aid on the gap in student dropout risk by income level. *Research in Higher Education*, *49*(1), 1–18.

Cheslock, J. J., & Gianneschi, M. (2008). Replacing state appropriations with alternative revenue sources: The case of voluntary support. *The Journal of Higher Education*, *79*(2), 208–229.

Cibik, M. A., & Chambers, S. L. (1991). Similarities and differences among Native Americans, Hispanics, Blacks, and Anglos. *NASPA Journal*, *28*(2), 129–139.

Clark, B. R. (2002). University transformation: Primary pathways to university autonomy and achievement. In S. J. Brint (Ed.), *The future of the city of intellect: The changing American university* (pp. 322–342). Palo Alto, CA: Stanford University Press.

College Board, The. (2010). *Trends in college pricing, 2009*. Retrieved from http://www.trends-collegeboard.com/college_pricing/pdf/2009_Trends_College_Pricing.pdf

College Board, The. (2012). *Trends in college pricing, 2012*. Retrieved from http://trends.collegeboard.org/sites/default/files/college-pricing-2012-full-report_0.pdf

Collis, D. J. (2002). New business models for higher education. In S. J. Brint (Ed.), *The future*

of the city of intellect: The changing American university (pp. 181–202). Palo Alto, CA: Stanford University Press.

Collison, M. (1988). Complex application form discourages many students from applying for federal financial aid, officials say. *The Chronicle of Higher Education*, *34*(43), A1.

Connolly, L. S. (1997). Does external funding of academic research crowd out institutional support? *Journal of Public Economics*, *64*(3), 389–406.

Cook, W. B., & Lasher, W. F. (1996). Toward a theory of fund raising in higher education. *Review of Higher Education*, *20*(1), 33–51.

Coomes, M. D. (1998). Trade school defaults: Proprietary schools and the federal family educational loan program. In R. Fossey & M. Bateman (Eds.), *Condemning students to debt: College loans and public policy* (pp. 126–160). New York, NY: Teachers College Press.

Corey, S. M. (2007). *The trends in and relationships between tuition price, institutional aid, enrollment, and tuition revenue and their determination of the net revenue generated by colleges and universities from 1988 to 2000*. (Doctoral dissertation). Retrieved from ProQuest Digital Dissertations. (AAT 3259915)

Council for Aid to Education. (2010). Contributions to colleges and universities down 11.9 percent to $27.85 billion; greatest decline ever recorded. Retrieved from http://www.cae.org/content/pdf/VSE_2009_Press_Relsease.pdf

Crimmins, J. C., & Keil, M. (1983). *Enterprise in the nonprofit sector*. Washington, DC: Partners for Livable Places.

Cronin, J.M., & Horton, H. E., (2009). Will higher education be the next bubble to burst? *The Chronicle of Higher Education*, 55(37), A56.

Cunningham, B. M., & Cochi-Ficano, C. K. (2002). The determinants of donative revenue flows from alumni of higher education: An empirical inquiry. *Journal of Human Resources*, *37*(3), 540–569.

de Zilwa, D. (2005). Using entrepreneurial activities as a means of survival: Investigating the process used by Australian universities to diversify their revenue streams. *Higher Education*, *50*(3), 387–411.

Delta Project on Postsecondary Education Costs, Productivity, and Accountability. (2010). *Trends in college spending: 1998-2008*. Retrieved from http://www.deltacostproject .org/resources/pdf/Trends-in-College-Spending-98-08.pdf

DesJardins, S. L., & Toutkoushian, R. K. (2005). Are students really rational? The development of rational thought and its application to student choice. *Higher Education: Handbook of Theory and Research*, *20*, 192–240.

DiMaggio, P. J. (1986). Can culture survive the marketplace? In P. DiMaggio (Ed.), *Nonprofit enterprise and the arts* (pp. 65–93). New York, NY: Oxford University Press.

Duderstadt, J. J., & Womack, F. W. (2003). *The future of the public university in America*. Baltimore, MD: John Hopkins University Press.

Dynarski, S. (2002, December). *The consequences of merit aid*. NBER Working Paper Series (9400). Cambridge, MA: National Bureau of Economic Research.

Dynarski, S. M., & Scott-Clayton, J. (2006). The cost of complexity in federal student aid: Lessons from optimal tax theory and behavioral economics. *National Tax Journal*, *59*(2), 31–-356.

Ehrenberg, R. G. (2000). Financial forecasts for the next decade. *The Presidency*, *3*(2), 30–34.

Ehrenberg, R. G. (2006). The perfect storm and the privatization of public higher education.

Change, *38*(1), 47–53.

Ehrenberg, R. G., & Rizzo, M. J. (2004). Financial forces and the future of American higher education. *Academe*, *90*(4), 28–31.

Ellwood, D., & Kane, T. J. (2000). Who is getting a college education: Family background and the growing gaps in enrollment. In S. Danziger & J. Waldfogel (Eds.), *Securing the future: Investing in children from birth to college* (pp. 283–324). New York, NY: Russell Sage Foundation.

Etzkowitz, H., Webster, A., & Healey, P. (Eds.). (1998). *Capitalizing knowledge: New intersections of industry and academia.* Albany: State University of New York.

Evans, L. J., & Archer, S. H. (1968). Diversification and the reduction of dispersion: An empirical analysis. *Journal of Finance*, *23*(5), 761–767.

Farkas, B. (2008, December 18). Higher education will struggle through the recession. *The Huffington Post.* Retrieved from http://www.huffingtonpost.com/brian-farkas/higher-education-will-str_b_151895.html

Faulkner, L. R. (2005). *The changing relationship between higher education and the states.* Washington, DC: Robert H. Atwell Distinguished Lecture at the American Council on Education Annual Meeting.

Ferris, J. M., & Graddy, E. (1989). Fading distinctions among the nonprofit, government, and for-profit sectors. In V. Hodgkinson & R. Lyman (Eds.), *The future of the nonprofit sector* (pp. 123–139). San Francisco, CA: Jossey-Bass.

Fisher, F. (1990). State financing of higher education: A new look at an old problem. *Change*, *22*, 42–56.

Flamini, R. (2012, August 23). Despite hard economic times, college admissions are on the rise. *Washington Times*. Retrieved from http://www.washingtontimes.com/news/2012/aug /23/despite-hard-economic-times-college-admissions-are/

Fogel, R. E. (1994). Designing and managing the fundraising program. In R. Herman (Ed.), *The Jossey-Bass handbook of nonprofit leadership and management* (pp. 369–381). San Francisco, CA: Jossey-Bass.

Fossey, R., & Bateman, M. (Eds.). (1998). *Condemning students to debt: College loans and public policy*. Williston, VT: Teachers College Press.

Foster, W., & Bradach, J. (2005). Should nonprofits seek profits? *Harvard Business Review*, *83*(2), 92–100.

Friedman, M. (1962). *Capitalism and freedom*. Chicago, IL: University of Chicago Press.

Friedman, M. (1968). The higher schooling in America. *Public Interest*, Spring, 108–112.

Friedman, M. (2008). *A theory of the consumption function*. Princeton, NJ: Princeton University Press.

Froelich, K. A. (1999). Diversification of revenue strategies: Evolving resource dependence in nonprofit organizations. *Nonprofit and Voluntary Sector Quarterly*, *28*(3), 246–268.

Froelich, K. A., & Knoepfle, T. W. (1996). Internal revenue service 990 data: Fact or fiction? *Nonprofit and Voluntary Sector Quarterly*, *25*(1), 40–52.

Froelich, K. A., Knoepfle, T. W., & Pollak, T. H. (2000). Financial measures in nonprofit organization research: Comparing IRS 990 return and audited financial statement data. *Nonprofit and Voluntary Sector Quarterly*, *29*(2), 232–254.

Fry, R. (2002). *Latinos in higher education: Many enroll, too few graduate*. Washington, DC: Pew Hispanic Center.

Fuller, R. J., & Farrell, J. L. (1987). *Modern investments and security analysis*. New York, NY: McGraw-Hill.

Galaskiewicz, J., & Bielefeld, W. (1998). *Nonprofit organizations in an age of uncertainty*. New York, NY: Aldine de Gruyter.

Gansemer-Topf, A. M., & Schuh, J. H. (2004). Instruction and academic support expenditures: An investment in retention and graduation. *Journal of College Student Retention: Research, Theory, and Practice, 5*(2), 135–145.

Ginsberg, B. (2012). *The fall of the faculty: The rise of the all-administrative university and why it matters*. New York, NY: Oxford University Press.

Giving USA Foundation. (2009). *U.S. charitable giving estimated to be $307.65 billion in 2008*. Retrieved from http://www.philanthropy.iupui.edu/News/2009/docs /GivingReaches300billion_06102009.pdf

Giving USA Foundation. (2010). *U.S. charitable giving falls 3.6 percent in 2009 to $303.75 billion*. Retrieved from http://www.philanthropy.iupui.edu/news/2010/06/pr-GUSA2010.aspx

Giving USA Foundation. (2012). *Donations barely grew at all last year*. Retrieved from http://philanthropy.com/article/Donations-Barely-Grew-at-All/132367/

Global University Network for Innovation. (2009). *Higher education at a time of transformation: New dynamics for social responsibility*. New York, NY: Palgrave Macmillan.

Goodman, R. (2009). Thriving through recession: Higher education in a down economy. *The New England Journal of Higher Education, 23*(5), 13–14.

Gottry, H. (1999). Profit or perish: Non-profit social service organization & social entrepreneurship. *Georgetown Journal on Poverty Law & Policy*, *6*(2), 249–275.

Grayson, K. (2003). 70 smart revenue generators. *University Business*. Retrieved from http://findarticles.com/p/articles/mi_m0LSH/is_12_6/ai_110962257/

Greenlee, J. S., & Trussel, J. M. (2000). Predicting the financial vulnerability of charitable organizations. *Nonprofit Management & Leadership*, *11*(2), 199–210.

Greenstone, M., & Looney, A. (2013). "Rising student debt burdens: Factors behind the phenomenon." Retrieved from http://www.brookings.edu/blogs/jobs/posts/2013/07/05-student-loans-debt-burdens-jobs-greenstone-looney

Griswold, C. P., & Marine, G. M. (1996). Political influences on state policy: Higher-tuition, higher-aid, and the real world. *Review of Higher Education*, *19*(4), 361–389.

Gronbjerg, K. A. (1993). *Understanding nonprofit funding: Managing revenues in social services and community development organizations*. San Francisco, CA: Jossey-Bass.

Hager, M. A. (2001). Financial vulnerability among arts organizations: A test of the Tuckman-Chang measures. *Nonprofit and Voluntary Sector Quarterly*, *30*(2), 376–392.

Hall, P. D. (1987). Abandoning the rhetoric of independence: Reflections on the nonprofit sector in the post-liberal era. *Journal of Voluntary Action Research*, *16*(1–2), 11–28.

Hansmann, H. (1987). Economic theories of nonprofit organization. In W. Powell (Ed.), *The non-profit sector: A research handbook* (pp. 27–42). New Haven, CT: Yale University Press.

Hansmann, H. (2000). *The ownership of enterprise*. Cambridge, MA: Harvard University Press.

Hauptman, A. M. (1997). Financing American higher education in the 1990s. *New Directions for Higher Education, 93,* 19–35.

Hearn, J.C. (1992). Emerging variations in postsecondary attendance patterns: An investigation of part-time, delayed, and nondegree enrollment. *Research in Higher Education, 33*(6),

657–687.

Hearn, J. C. (1998). The growing loan orientation in federal financial aid policy: A historical perspective. In R. Fossey & M. Bateman. (Eds.), *Condemning students to debt: College loans and public policy* (pp. 47–75). New York, NY: Teachers College Press.

Hearn, J. C. (2001). Access to postsecondary education: Financing equity in an evolving context. In M. B. Paulsen & J. C. Smart (Eds.), *The finance of higher education: Theory, research, policy, and practice* (pp. 439–460). New York, NY: Agathon Press.

Hearn, J. C. (2003). *Diversifying campus revenue streams: Opportunities and risks*. Report for the American Council on Education series Informed Practice: Syntheses of Higher Education Research for Campus Leaders. Washington, DC: American Council on Education.

Hearn, J. C., & Holdsworth, J. M. (2004). Federal student aid: The shift from grants to loans. In E. P. St. John & M. D. Parsons (Eds.), *Public funding of higher education* (pp. 40–59). Baltimore, MD: Johns Hopkins University Press.

Hearn, J. C., & Longanecker, D. (1985). Enrollment effects of alternative postsecondary pricing policies. *Journal of Higher Education*, *56*(5), 485–508.

Heller, D. E. (1996). *Tuition prices, financial aid, and access to public higher education: A state-level analysis*. Paper presented at the American Educational Research Association, New York, NY.

Heller, D. E. (1997). Student price response in higher education: An update to Leslie and Brinkman. *Journal of Higher Education*, *68*(6), 624–644.

Heller, D. E. (1999). The effects of tuition and state financial aid on public college enrollment. *The Review of Higher Education*, *23*(1), 65–89.

Heller, D. E., & Marin, P. (Eds.). (2002). *Who should we help? The negative social consequences of merit scholarships*. Cambridge, MA: The Civil Rights Project, Harvard University.

Heller, D. E., & Marin, P. (Eds.). (2004). *State merit scholarship programs and racial inequality*. Cambridge, MA: The Civil Rights Project, Harvard University.

Hess, F. M., Schneider, M., Carey, K., & Kelley, A. P. (2009). *Diplomas and dropouts: Which colleges actually graduate their students (and which don't)*. Washington, D.C: American Enterprise Institute.

Hill, C. B., & Winston, G. C. (2006). Access: Net prices, affordability, and equity at a highly selective college. *Economics of Education Review, 25*(1), 29–41.

Hodge, M., & Piccolo, R. (2005). Funding source, board involvement techniques, and financial vulnerability in nonprofits. *Nonprofit Management & Leadership*, *16*(2), 171–190.

Hoenack, S. A. (1971). The efficient allocation of subsidies to college students. *The American Economic Review*, *61*, 302–311.

Hoenack, S. A. (1982). Pricing and efficiency in higher education. *Journal of Higher Education, 53*(4), 403–418.

Hodgkinson, V. A. (1989). Key challenges facing the nonprofit sector. In V. Hodgkinson & R. Lyman (Eds.), *The future of the nonprofit sector* (pp. 3–19). San Francisco, CA: Jossey-Bass.

Hodgkinson, V. A.,Weitzman, M. A., Noga, S. M., & Gorski, H. A. (1993). *A portrait of the independent sector: The activities and finances of charitable organizations*. Washington, DC: Independent Sector.

Horne, C. S. (2005). *Toward an understanding of the revenue of nonprofit organizations*.

(Doctoral dissertation). Retrieved from ProQuest Digital Dissertations. (AAT 3198549)

Hossler, D., Lund, J., Ramin, J., Westfall, S., & Irish, S. (1997). State funding for higher education: The Sisyphean task. *Journal of Higher Education*, *68*(2), 160–190.

House, M. L. (1987). *Annual fund raising in public higher education: The development and validation of a prediction equation.* (Doctoral dissertation). Retrieved from ProQuest Digital Dissertations (AAT 8809647).

Hovey, H. A. (1999). *State spending for higher education in the next decade: The battle to sustain current support*. Washington, DC: The National Center for Public Policy and Higher Education.

Hsing, Y., & Chang, H. S. (1996). Testing increasing sensitivity of enrollment at private institutions to tuition and other costs. *American Economist*, *40*(1), 40–45.

Hurtado, S., & Carter, D. F. (1997). Effects of college transition and perceptions of the campus racial climate on Latino college students' sense of belonging. *Sociology of Education*, *70*(4), 324–345.

Hurtado, S., Carter, D. F., & Spuler, A. (1996). Latino student transition to college: Assessing difficulties and factors in successful adjustment. *Research in Higher Education*, *37*(2), 135–157.

Hurtado, S., & Ponjuan, L. (2005). Latino educational outcomes and the campus climate. *Journal of Hispanic Higher Education*, *2005*(4), 235–251.

Jaschik, S. (2005, July 11). Cutting tuition, increasing revenue. *Inside Higher Education*. Retrieved from http://www.insidehighered.com/news/2005/07/11/tuition

Jegers, M. (1997). Portfolio theory and nonprofit financial stability: A comment and extension. *Nonprofit and Voluntary Sector Quarterly*, *26*(1), 65–72.

Johnes, G. (1993). *The economics of education*. New York, NY: St. Martin's Press.

Johnson, G. P., & Leslie, L. L. (1976). Increasing public tuition in higher education: An alternative approach to the equity issue. *Educational Administration Quarterly, 12*(1), 7–42.

Johnstone, B. (2002). Challenges of financial austerity: Imperatives and limitations of revenue diversification in higher education. *The Welsh Journal of Education, 11*(1), 18–36.

Johnstone, B. (2003a). Cost sharing in higher education: Tuition, financial assistance, and accessibility in a comparative perspective. *Czech Sociological Review, 39*(3), 351–374.

Johnstone, B. (2003b). The economics and politics of cost sharing in higher education: Comparative perspectives. *Economics of Education Review, 23*(4), 403–410.

Johnstone, B. (2005). Financing higher education: Who should pay? In P. G. Altbach, R. O. Berdahl, & P. J Gumport (Eds.), *American higher education in the twenty-first century: Social, political, and economic challenges* (pp. 369–392). Baltimore, MD: Johns Hopkins.

Jones, D., & Wellman, J. (2010). Breaking bad habits: Navigating the financial crisis. *Change, 42*(3), 6–13.

Kaltenbaugh, L. S., St. John, E. P., & Starkey, J. B. (1999). What difference does tuition make? Analysis of ethnic differences in persistence. *Journal of Student Financial Aid, 29*(2), 21–31.

Kane, T. J. (1994). *The causes and consequences of recent public tuition increases*. Cambridge, MA: Kennedy School of Government.

Kane, T. J. (1995). *Rising public college tuition and college entry: How well do public subsidies promote access to college*? (Working Paper No. 5164). Cambridge, MA: National Bureau

of Economic Research.

Kane, T. J. (1999). *The price of admission: Rethinking how Americans pay for college*. Washington, DC: The Brookings Institution.

Kane, T. J., Orszag, P. R., & Gunter, D. L. (2003). *State fiscal constraints and higher education spending: The role of Medicaid and the business cycle*. Washington, DC: The Urban Institute.

Kaplan, G. A., Pamuk, E. R., Lynch, J. W., Cohen, R. D., & Balfour, J. L. (1996). Inequality in income and mortality in the United States: Analysis of mortality and potential pathways. *British Medical Journal*, *312*(7037), 999–1003.

Kelderman, E. (2009). Public colleges consider privatization as a cure for the common recession. *The Chronicle of Higher Education*, *55*(34), A16.

Kelly, K. S. (1991). *Fund raising and public relations*. Mahwah, NJ: Lawrence Erlbaum.

Keppler, K. (2010). Alternate budgetary sources during budget rescissions. *New Directions for Student Services, 129*, 29–41.

Kerr, C. (1963). *The uses of the university*. Cambridge, MA: Harvard University Press.

Kezar, A. (2004). Obtaining integrity? Reviewing and examining the charter between higher education and society. *The Review of Higher Education*, *27*(4), 429–459.

Kienle, J. (1997). Facilities that help pay for themselves. *Planning for Higher Education*, *26*(1), 14–17.

Kiker, B. F. (1971). *Investment in human capital*. Columbia: University of South Carolina Press.

Kingma, B. (1993). Portfolio theory and nonprofit financial stability. *Nonprofit and Voluntary Sector Quarterly*, *22*(2), 105–120.

Knecht, R. (2009). Colleges must face reality and recognize opportunity in the economic

downturn. *The Chronicle of Higher Education*, *55*(18), A128.

Kohn, M., Manski, C., & Mundel, D. (1976). An empirical investigation of factors which influence college-going behavior. *Annals of Economic and Social Measures*, *5*(1), 391–419.

Kramer, R. M. (1985). The future of the voluntary sector in a mixed economy. *Journal of Applied Behavioral Science*, *21*(4), 377–391.

Kuh, G. D, & Love, P. G. (2000). A cultural perspective on student departure. In J. M. Braxton (Ed.), *Reworking the student departure puzzle* (pp. 196–212). Nashville, TN: Vanderbilt University Press.

Larson, E. (1997). Why colleges cost too much. *Time Magazine*, *149*(11), 46–54.

Leder, M. (2002, August 25). Personal business: Your alma mater wants to become your bank. *New York Times*, 8.

Lenth, C. (1993). *The tuition dilemma: State policies and practices in pricing public higher education*. Denver, CO: State Higher Education Executive Officers.

Leslie, L. L., & Brinkman, P. (1987). Student price response in higher-education: The student demand studies. *Journal of Higher Education*, *58*(2), 181–204.

Leslie, L. L., & Brinkman, P. T. (1988). *The economic value of higher education*. New York, NY: Macmillan.

Leslie, L. L., & Ramey, G. (1988). Donor behavior and voluntary support for higher education institutions. *Journal of Higher Education*, *59*(2), 115–132.

Leslie, L. L., & Slaughter, S. A. (1992). Higher education and regional economic development. In W. E. Becker and D. R. Lewis (Eds.), *The Economics of American Higher Education*

(pp. 223-252). Boston, MA: Kluwer Academic Publishers.

Liebschutz, S. F. (1992). Coping by nonprofit organizations during the Reagan years. *Nonprofit Management & Leadership*, *2*(4), 363–380.

Lindsey, L. B., & Steinberg, R. (1990). *Joint crowd-out: An empirical study of the impact of federal grants on state government expenditures and charitable donations* (Working Paper No. 3226). Cambridge, MA: National Bureau of Economic Research.

Lips, D. (2010, March 15). Popping the higher-education bubble. *National Review*. Retrieved from http://www.nationalreview.com/articles/229312/popping-higher-education-bubble/dan-lips#

Longanecker, D. (2006). A tale of two pities. *Change*, *38*(1), 14–25.

Lumina Foundation (2012). *A stronger nation through higher education*. Retrieved from http://www.luminafoundation.org/publications/A_stronger_nation.pdf

Madrick, J. (2004, August 5). Why higher learning gets the ax. *New York Times*. Retrieved from http://www.nytimes.com/2004/08/05/business/05scene.html?pagewanted=all

Manski, C. F., & Wise, D. A. (1983). *College choice in America*. Cambridge, MA: Harvard University Press.

Marcucci, P., Johnstone, B. D., & Ngolovoi, M. (2008). Higher educational cost-sharing, dual-track tuition fees, and higher educational access: The east African experience. *Peabody Journal of Education*, *83*(1), 101–116.

Markowitz, H. M. (1952). Portfolio selection. *Journal of Finance, 7*(1), 77–91.

Marshall, R., & Tucker, M. (1993). *Thinking for a living: Education and the wealth of nations*. New York, NY: Basic Books.

Masterson, K. (2008a). Colleges lower their expectations for endowments. *The Chronicle of*

Higher Education, *55*(6), A15.

Masterson, K. (2008b). Modesty can be a virtue for endowments in hard times. *The Chronicle of Higher Education*, *55*(17), A10.

McCarthy, E.D. (1996). *Sharing the costs of postsecondary education in Vermont: A case study of a "high tuition, high aid" state strategy*. Paper presented at the Association for the Study of Higher Education 21st Annual Meeting, Memphis, October 31.

McDaniel, E. A., & Epp, R. H. (1995). Fee-based information services: The promises and pitfalls of a new revenue source in higher education. *Cause/Effect*, *18*(2), 35–39.

McMahon, W. W. (1997). Conceptual framework for measuring the total social and private benefits of education. *International Journal of Educational Research*, *27*(6), 449–481.

McPherson, M. S. (1978). The demand for higher education. In D. W. Breneman and C. E. Finn (Eds.), *Public policy and private higher education* (pp. 143-196). Washington DC: The Brookings Institution.

McPherson, M. S. (1999). Balancing competing values: The market & the mission. *The Presidency*, *2*(2), 22–27.

McPherson, M. S., & Schapiro, M. O. (1989). *Measuring the effects of federal student aid: An assessment of some methodological and empirical problems*. Williamstown, MA: Williams Project on the Economics of Higher Education.

McPherson, M. S., & Schapiro, M. O. (1991). *Keeping college affordable: Government and educational opportunity*. Washington, DC: The Brookings Institution.

McPherson, M. S., & Schapiro, M. O. (2000). Financing lifelong learning, trends and patterns of participation and financing in US higher education. *Higher Education Management*, *12*(2), 131–156.

Meyer, J. W., & Rowan, B. (1977). Institutionalized organizations: Formal structure as myth and ceremony. *American Journal of Sociology, 83*(2), 440–463.

Milshtein, A. (2002). Auxiliary services: Where's the bottom line? *College Planning & Management, 5*(6), 60–61.

Mincer, J. (1993). Human capital and earnings. In J. Mincer (Ed), *Studies in human capital: Collected essays of Jacob Mincer* (pp. 69-97). Brookfield, VT: Edward Elgar.

Mingle, J. (1992). *Low tuition, progressive taxation*. Washington DC: Association of Governing Boards.

Miracle, W. D. (1977). *Differences between givers and non-givers to the University of Georgia annual fund*. (Doctoral dissertation). Retrieved from ProQuest Digital Dissertations. (AAT 7730493)

Mishel, L., & Shierholz, H. (2009, June 2). The worst downturn since the great depression. *Economic Policy Institute*. Retrieved from http://www.epi.org/publications/entry/jobspict_200906_preview/

Moore, R. L., Studenmund, A. H., & Slobko, T. (1991). The effect of the financial aid package on the choice of a selective college. *Economics of Education Review, 10*(4), 311–321.

Mortensen, T. G. (2004). State tax fund appropriations for higher education: FY1961 to FY2004. *Postsecondary Education Opportunity, 139*(1), 1–20.

Mortensen, T. G. (2009). Family income and educational attainment 1970 to 2009. *Postsecondary Education Opportunity, 221*(1), 1–16.

Mumper, M. (1996). *Removing college price barriers*. Albany: State University of New York Press.

Mumper, M. (2001). State efforts to keep public colleges affordable in the face of fiscal stress. In

M. B. Paulsen & J. C. Smart (Eds.), *The finance of higher education: Theory, research, policy, and practice* (pp. 321–354). Edison, NJ: Agathon Press.

Musgrave, R. S., & Musgrave, P. B. (1984). *Public finance in theory and practice*. New York, NY: McGraw-Hill.

National Association of College and University Business Officers. (2010). *U.S. and Canadian institutions listed by fiscal year 2009 endowment market value and percentage change in endowment market value from FY 2008 to FY 2009.* Retrieved from http://www.nacubo.org/Documents/research/2009_NCSE_Public_Tables_Endowment_Market_Values.pdf

National Center for Educational Statistics. (2013). *The condition of education 2013*. Retrieved from http://nces.ed.gov/pubs2013/2013037.pdf

National Council for State Legislatures. (2009, December 9). The fiscal nightmare continues for states. *NCSL News*. Retrieved from http://www.ncsl.org/?tabid=19250

Neely, P. (1999). The threats to liberal arts colleges. *Journal of the American Academy of the Arts and Sciences, 128*(1), 27–45.

Newman, F. (1985). *Higher education and the American resurgence*. Princeton, NJ: Carnegie Foundation for the Advancement of Teaching.

Newman, F. (2000). Saving higher education's soul. *Change, 32*(5), 16–23.

Newman, F., & Courturier, L. K. (2001). The new competitive arena: Market forces invade the academy. *Change*, *33*(5), 10–17.

Nora, A., & Cabrera, A. F. (1996). The role of perceptions of prejudice and discrimination on the adjustment of minority students to college. *Journal of Higher Education, 67*(2), 119–148.

Okten, C., & Weisbrod, B. A. (2000). Determinants of donations in private nonprofit markets. *Journal of Public Economics, 75*(2), 255–272.

Olson, L., & Rosenfeld, R. (1984). Parents and the process of gaining access to student financial aid. *Journal of Higher Education*, *55*(4), 455–480.

Organization for Economic Co-Operation and Development (2010). *Education at a Glance 2010: OECD Indicators*. Retrieved from www.oecd.org/edu/eag2010

O'Toole, D.M., Stratton, L.S., Wetzel, J.N. (2003). A longitudinal analysis of the frequency of part-time enrollment and the persistence of students who enroll part time. *Research in Higher Education*, *44*(5), 519–537.

Pascarella, E. T., & Terenzini, P. T. (2005). *How college affects students: A third decade of research.* San Francisco, CA: Jossey-Bass.

Paulsen, M. B. (1996). Higher education and state workforce productivity. *NEA Higher Education Journal*, *12*(1), 55–77.

Paulsen, M. B. (1998). Recent research on the economics of attending college: Returns on investment and responsiveness to price. *Research in Higher Education*, *39*(4), 471–479.

Paulsen, M. B. (2001a). The economics of human capital and investment in higher education. In M. B. Paulsen & J. C. Smart (Eds.), *The finance of higher education: Theory, research, policy, and practice* (pp. 55–94). New York, NY: Agathon Press.

Paulsen, M. B. (2001b). The economics of the public sector: The nature and role of public policy in the finance of higher education. In M. B. Paulsen & J. C. Smart (Eds.), *The finance of higher education: Theory, research, policy, and practice* (pp. 95–132). Edison, NJ: Agathon Press.

Paulsen, M. B., & St. John, E. P. (1997). The financial nexus between college choice and persistence. In R. A. Voorhees (Ed.), *Researching student aid: Creating an action plan* (pp. 65–82). San Francisco, CA: Jossey-Bass.

Paulsen, M. B., & St. John, E. P. (2002). Social class and college costs: Examining the financial nexus between college choice and persistence. *Journal of Higher Education, 73*(2), 189–236.

Payne, A. A. (1998). Does the government crowd-out private donations? New evidence from a sample of non-profit firms. *Journal of Public Economics, 69*(3), 323–345.

Payne, A. A. (2001). Measuring the effect of federal research funding on private donations at research universities: Is federal research funding more than a substitute for private donations? *International Tax and Public Finance, 8*(5–6), 734–751.

Pechman, J. A. (1970). The distributional effects of public higher education in California. *Journal of Human Resources, 5*(3), 361–370.

Peterson, P. A. (1986). From impresario to arts administrator. In P. DiMaggio (Ed.), *Nonprofit enterprise and the arts* (pp. 161–183). New York, NY: Oxford University Press.

Pfeffer, J., & Salancik, G. R. (1978). *The external control of organizations: A resource dependence perspective*. New York, NY: Harper & Row.

Phillips, E. C., Morell, C., & Chronister, J. L. (1996). Responses to reduced stated funding. In D. W. Breneman and A. L. Taylor (Eds.), *Strategies for Promoting Excellence in a Time of Scarce Resources* (pp. 9–20). San Francisco, CA: Jossey-Bass.

Post, D. (1990). College-going decisions by Chicanos: The politics of misinformation. *Educational Evaluation and Policy Analysis*, *12*(2), 174–187.

Powell, W. W., & Owen-Smith, J. (1998). Universities and the market for intellectual property in the life sciences. *Journal of Policy Analysis and Management, 17*(2), 253–277.

Pratt, L. R. (2003). Will budget troubles restructure higher education? *Academe, 89*(1), 33–38.

Price, D. (2004). *Borrowing inequality: Race, class, and student loans*. Boulder, CO: Lynne

Rienner Publishers.

Primary Research Group (1997). *Forecasting college and university revenues*. New York, NY: Primary Research Group, Inc.

Reynolds, G. H. (2012). *The higher education bubble*. Jackson, TN: Encounter Books.

Rizzo, M. J. (2006). State preferences for higher education spending: A panel data analysis, 1977–2001. In R. G. Ehrenberg (Ed.), *What's happening to public higher education?* (pp. 3–35). Westport, CT: Praeger Publishers.

Roberts, R. D. (1984). A positive model of private charity and public transfers. *Journal of Political Economy*, *92*(1), 136–148.

Rooney, P. M. (1999). A better method for analyzing the costs and benefits of fundraising at universities. *Nonprofit Management and Leadership*, *10*(1), 39–56.

Rowley, L., & Hurtado, S. (2003). Non-monetary benefits of undergraduate education. In D.R. Lewis and J. Hearn (Eds.), *The public research university: Serving the public good in new times* (pp. 207–229). Lanham, MD: University Press of America.

Ryan, J. F. (2004). The relationship between institutional expenditures and degree attainment at baccalaureate colleges. *Research in Higher Education*, *45*(2), 97–114.

Salamon, L. M. (1987). Partners in public service. In W. Powell (Ed.), *The nonprofit sector: A research handbook* (pp. 99–117). New Haven, CT: Yale University Press.

Savoca, E. (1990). Another look at the demand for higher education: Measuring the price sensitivity of the decision to apply to college. *Economics of Education Review*, *9*(2), 123–134.

Scarlett, M. (2004). *The great rip-off in American education: Undergrads underserved*. Amherst, NY: Prometheus Books.

Schiff, J. (1985). Does government spending crowd out charitable contributions? *National Tax Journal*, *38*(4), 535–546.

Schiff, J. (1990). *Charitable giving and government policy: An economic analysis*. Westport, CT: Greenwood Press.

Schneider, A. (1999). Master's degrees, once scorned, attract students and generate revenue. *The Chronicle of Higher Education*, *45*(37), A12-A13.

Schultz, T. W. (1961). Investment in human capital. *American Economic Review, 51*(1), 1035–1039.

Scott, C. L. (2005). *Enhancing community college revenue sources by leveraging land resources*. (Doctoral dissertation). Retrieved from ProQuest Digital Dissertations. (AAT 3207155)

Scott, W. R. (1987). *Organizations: Rational, natural, and open systems*. Englewood Cliffs, NJ: Prentice-Hall.

Shin, J. C., & Milton, S. (2008). Student response to tuition increase by academic majors: Empirical grounds for a cost-related tuition policy. *Higher Education*, 55(6), 719–734.

Slaughter, S., & Leslie, L. L. (1997). *Academic capitalism: Politics, policies, and the entrepreneurial university*. Baltimore, MD: Johns Hopkins University Press.

Smith, S. R., & Lipsky, M. (1993). *Nonprofits for hire*. Cambridge, MA: Harvard University Press.

Smith, T. Y. (1992). Discipline cost indices and their implications. *Research in Higher Education*, *33*(1), 59–70.

Stack, K. J. (1987). *Auxiliary activities: A revenue maximization model analyzing school-operated and vendor-contracted bookstores and food services in the public community colleges*. (Doctoral dissertation). Retrieved from ProQuest Digital

Dissertations. (AAT 8728333)

St. John, E. P. (1990). Price response in enrollment decisions: An analysis of the high school and beyond sophomore cohort. *Research in Higher Education, 31*(2), 161–176.

St. John, E. P. (1991). What really influences minority attendance? Sequential analyses of the high school and beyond sophomore cohort. *Research in Higher Education, 32*(2), 141–158.

St. John, E. P. (2006). *Education and the public interest: School reform, public finance, and access to higher education*. Dordrecht, The Netherlands: Springer.

St. John, E. P., Cabrera, A. F., Nora, A., & Asker, E. H. (2000). Economic influences on persistence reconsidered: How can finance research inform the reconceptualization of persistence models? In J. M. Braxton (Ed.), *Reworking the student departure puzzle* (pp. 29–47). Nashville, TN: Vanderbilt University Press.

St. John, E. P., Daun-Barnett, N., Moronski-Chapman, K. M. (2013). *Public policy and higher education: Reframing strategies for preparation, access, and college success*. New York, NY: Routledge.

St. John, E. P., & Musoba, G. D. (2011). *Pathways to academic success in higher education: Expanding opportunity for underrepresented students*. New York, NY: Routledge.

St. John, E. P., & Noell, J. (1989). The effects of student financial aid on access to higher education: An analysis of progress with special consideration of minority enrollment. *Research in Higher Education, 30*(6), 563–581.

St. John, E. P., Paulsen, M. B., & Carter, D. F. (2005). Diversity, college costs, and postsecondary opportunity: An examination of the financial nexus between college choice and persistence for African Americans and whites. *Journal of Higher Education*,

76(5), 545–569.

St. John, E. P., & Starkey, J. B. (1995). An alternative to net price: Assessing the influence of prices and subsidies on within-year persistence. *Journal of Higher Education*, *66*(2), 156–186.

Stampen, J. (1980). *The financing of public higher education: Low tuition, student aid, and the federal government*. ASHE-ERIC Higher Education Report No. 9. Washington, DC: The George Washington University.

State Higher Education Executive Officers (2013). *State higher education finance FY2012*. Retrieved from http://www.sheeo.org/sites/default/files/publications/SHEF%20FY%2012-0130322rev.pdf

Stratton, L. S., O'Toole, D. M., Wetzel, J. N. (2004). Factors affecting initial enrollment intensity: Part-time versus full-time enrollment. *Economics of Education Review*, *23*(2), 167–175.

Tannock, S. (2006). Higher education, inequality, and the public good. *Dissent*, 53(2), 45–51.

Taylor, A. L., & Martin, J. C. (1995). Characteristics of alumni donors and non-donors at a research I, public university. *Research in Higher Education*, *36*(3), 283–302.

Thomson, S. C. (2008). The credit crisis goes to college. *National Crosstalk, 16*(1).

Thursby, J. G., & Thursby, M. C. (2002). Who is selling the ivory tower? Sources of growth in university licensing. *Management Science*, *48*(1), 90–104.

Tierney, M. L. (1980). The impact of financial aid on student demand for public/private higher education. *Journal of Higher Education*, *51*(5), 527–545.

Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of Higher Education, 45*, 89–125.

Tinto, V. (1992). Student attrition and retention. In B. R. Clark & G. R. Neave (Eds.), *The encyclopedia of higher education* (pp. 1697–1709). Oxford: Pergamon.

Tinto, V. (1997). Classrooms as communities: Exploring the educational character of student persistence. *Journal of Higher Education*, *68*, 599–623.

Toutkoushian, P. K. (2001). Trends in revenues and expenditures for public and private higher education. In M. B. Paulsen & J. C. Smart (Eds.), *The finance of higher education: Theory, research, policy, and practice* (pp. 11–38). Edison, NJ: Agathon Press.

Trussel, J. M. (2002). Revisiting the prediction of financial vulnerability. *Nonprofit Management & Leadership*, *13*(1), 17–31.

Tuckman, H. P. (1998). Competition, commercialization, and the evolution of nonprofit organizational structures. *Journal of Policy Analysis and Management*, *17*(2), 175–194.

Tuckman, H. P., & Chang, C. F. (1991). A methodology for measuring the financial vulnerability of charitable nonprofit organizations. *Nonprofit and Voluntary Sector Quarterly*, *20*(4), 445–460.

Volkwein, J. F., & Cabrera, A. F. (1998). Who defaults on student loans?: The effects of race, class, and gender on borrower behavior. In R. Fossey & M. Bateman (Eds.), *Condemning students to debt: College loans and public policy* (pp. 105–125). New York, NY: Teachers College Press.

U.S. Census Bureau. (2013). *Income, Poverty and Health Insurance Coverage in the United States: 2012*. Retrieved from http://www.census.gov/prod/2013pubs/p60-245.pdf

U.S. Department of Labor, Bureau of Labor Statistics. (2010, March). All firm sizes hit hard during the current recession. *Issues in Labor Statistics*. Retrieved from http://www.bls.gov/opub/ils/pdf/opbils79.pdf

Useem, M. (1987). Corporate philanthropy. In W. Powell (Ed.), *The nonprofit sector: A research handbook* (pp. 340–359). New Haven, CT: Yale University Press.

Von Drehle, D. (2010). The other financial crisis. *Time*, *175*(25), 22–33.

Wallace, T. P. (1993). Public higher education finance: The dinosaur age persists. *Change*, *25*(4), 56–63.

Walpole, M. (2003). Socioeconomic status and college: How SES affects college experiences and outcomes. *Review of Higher Education*, *27*(1), 45–73.

Wangenge-Ouma, G., & Cloete, N. (2008). Financing higher education in South Africa: Public funding, non-government revenue and tuition fees. *South African Journal of Higher Education*, *22*(4), 906–919.

Warr, P. G. (1982). Pareto optimal redistribution and private charity. *Journal of Public Economics*, *19*(1), 131–138.

Weerts, D. J., & Ronca, J. M. (2006). Examining differences in state support for higher education: A comparative study of state appropriations for research I universities. *The Journal of Higher Education*, *77*(6), 935–967.

Weerts, D. J., & Ronca, J. M. (2008). *Determinants of state appropriations for higher education from 1985–2005: An organizational theory analysis.* Madison, WI: WISCAPE.

Weisbrod, B. A. (1998). The nonprofit mission and its financing. *Journal of Policy Analysis and Management*, *17*(2), 165–174.

Weisbrod, B. A. (2004). The pitfall of profits. *Stanford Social Innovation Review*, *2*(3), 40–47.

Weisbrod, B. A., & Asch, E. D. (2010). The truth about the "crisis" in higher education finance. *Change*, *42*(1), 23–29.

Wertz, R. D. (1997). Big business on campus: Examining the bottom line. *The Educational*

Record, *78*(1), 18–24.

Wills, E. (2005). Campuses for hire. *The Chronicle of Higher Education*, *51*(48), A6.

Wilson, R. (2008). As credit crisis chills campuses, worries mount. *The Chronicle of Higher Education*, *55*(7), A1.

Wing, K. T., Roeger, K. L., & Pollak, T. H. (2010). *The nonprofit sector in brief: Public charities, giving, and volunteering, 2010*. Report sponsored by The Urban Institute. Retrieved from http://www.urban.org/publications/412085.html

Winston, G. C. (1992). Hostility, maximization, & the public trust: Economics and higher education. *Change*, *24*(1), 20–27.

Winston, G. C. (1997). Why can't a college be more like a firm? *Change*, *29*(5), 32–38.

Winston, G. C. (1998). Higher education subsidies: Why all college students pay less for their education than it costs to produce. *Connection*, *13*(1), 13–15.

Wolinsky, H. (2009). The crash reaches the universities. *The EMBO Journal*, *10*(3), 209–211.

Wollan, M., & Lewin, T. (2009, November 20). Students protest tuition increases. *New York Times*. Retrieved from http://www.nytimes.com/2009/11/21/us/21tuition.html

Worth, M. J. (2009). *Nonprofit management: Principles and practice*. Los Angeles, CA: SAGE Publications.

Young, D. R. (1998). Commercialism in nonprofit social service associations: Its character, significance, and rationale. *Journal of Policy Analysis and Management*, *17*(2), 278–297.

Young, D. R. (Ed.). (2007). *Financing nonprofits: Putting theory into practice*. Lanham, MD: National Center on Nonprofit Enterprise and AltaMira Press.

Zeiss, T. (2003). Generating new sources of revenue. *New Directions for Community Colleges*, *2003*(124), 53–61.

Zemsky, R., Shaman, S., & Shapiro, D. B. (2001). Higher education as competitive enterprise: When markets matter. *New Directions for Institutional Research, 111,* 9–20.

Zezima, K. (2009, January 26). Data show college endowments loss is worst drop since '70s. *The New York Times*. Retrieved from http://www.nytimes.com/2009/01/27/education /27college.html

Zumeta, W. (2001). State policy and private higher education. In M. B. Paulsen & J. C. Smart (Eds.), *The finance of higher education: Theory, research, policy, and practice* (pp. 355–412). New York, NY: Agathon Press.

Zumeta, W. (2004). State higher education financing: Demand imperatives meet structural, cyclical, and political constraints. In E. P. St. John & M. D. Parsons (Eds.), *Public funding of higher education* (pp. 79–107). Baltimore, MD: Johns Hopkins University Press.

Zumeta, W. (2007). Financing higher education access in challenging times. In *The NEA 2007 almanac of higher education* (pp. 57-70). Washington DC: National Education Association.

Zumeta, W., Breneman, D. W., Callan, P. M., & Finney, J. E. (2012). *Financing American higher education in the era of globalization*. Cambridge, MA: Harvard Education Press.