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## The Relationship Between Unemployment and College Enrollment and Success Outcomes

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FLORIDA STATE UNIVERSITY

COLLEGE OF EDUCATION

THE RELATIONSHIP BETWEEN UNEMPLOYMENT  
AND COLLEGE ENROLLMENT AND SUCCESS OUTCOMES

By

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To my wonderful husband, Adrian

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## ABSTRACT

The purpose of this longitudinal study is to explore the relationship between the national unemployment rate and college enrollment and success outcomes (retention, and completion), controlling for student characteristics (gender, race/ethnicity, and socio-economic status), as well as state and national economic and institutional factors. The study finds that college enrollment and success outcomes at public 4-year institutions of higher education (IHEs) are impacted in a statistically significant manner by variations in the national unemployment rate. A positive relationship was found between the national unemployment rate and undergraduate enrollment, full-time retention, and college completions. However, the impact differed for students with different characteristics (gender, race/ethnicity, and socioeconomic status). Enrollment in public 4-year IHEs of both males and females was found to increase by 1.2 percent and 1.9 percent, respectively, when the national unemployment rate increased by one percent. Blacks and Whites were found to increase enrollment in public 4-year IHEs by 1 percent and 1.4 percent, respectively, or decrease (American Indian, Asian, and Hispanics) enrollments when the national unemployment rates increased. Finally, enrollments of students from the lowest SES quintiles (Q1, Q2) were found to decrease by more than five percent while the ones from the mid to highest quintiles (Q3-Q5) were found to increase by more than 1 percent when the unemployment rates increased.

# CHAPTER ONE

## INTRODUCTION

### Background

It is rather remarkable to note that the relationship between national unemployment rates and college enrollment and success outcomes (retention, and completion) has not received much attention in the scholarly literature. While scholars have focused on exploring other factors impacting these outcomes and have looked at the role of state or local unemployment rates (Cameron & Hackman, 2001; Black & Sufi, 2002; Dellas & Sakellaris, 2003; Perna & Titus, 2004; Turner, 2004; Stratton, et al., 2007; Goyette 2008), the assessment of the effect of the national unemployment rate on college enrollment and success outcomes has received very little attention (Betts & McFarland, 1995; Dellas & Sakellaris, 2003; Boffy-Ramirez, et al., 2010). While Betts and McFarland (1995) found a positive relationship between the national unemployment rate and community college enrollments, the same relationship was never examined for public 4-year institutions of higher education (IHE). Dellas & Sakellaris (2003) examined the “young individuals’ decision to enroll in 2- and 4-year colleges” over a period of 19 years and found enrollment in 4-year IHEs to be larger, “the ratio being about seven to three” (p. 166). According to the National Center for Educational Statistics (NCES) 2013 survey, the total number of public 4-year institutions was 629, with a cumulative enrollment of 6.8 million students; while enrollments at public 2-year IHEs added up to 6.2 million at 1,070 institutions, surpassing enrollments at private 4-year IHEs (4.1 million) and private 2-year IHEs (0.3 million) (NCES). Therefore, an exploration of

whether or not a relationship exists between the national unemployment rate and public 4-year IHE enrollments and outcomes is warranted, as these IHEs enroll the largest portion of students as compared with private 4-year and public and private 2-year IHEs (NCES).

Additionally, the Great Recession (2007-2009) led to changes in the higher education landscape at both the state and national levels (Keller & Hoover, 2011; Woodhouse, 2012; Kiley, 2013). First, the Great Recession led states to decrease appropriations to higher education, which pushed IHEs to find creative ways to balance their budgets so that all state priorities-- K-12 education, health, the judicial system and so on (Breneman, 2002, 2008; Delaney & Doyle, 2011 )--were being addressed. Decreases in funding severely impacted public IHEs and prompted them to find alternative revenues (Breneman 2002; 2008; Holley & Harris, 2010). While some public IHEs raised tuition as a way to cope with the severe underfunding, other IHEs were prohibited from doing so, or at least from doing it to the level they wanted to, as was the case for Florida and California (Keller & Hoover, 2011; Woodhouse, 2012; Kiley, 2013).

Additionally, besides decreasing appropriations to higher education during periods of economic contraction or recessions, some state legislatures further limited the availability of these scarce funds, most notably with the institution of performance based funding (PBF) (Tandberg & Hillman, 2014). In this manner, some state legislatures either discarded the previous funding formulas, most of which were based on enrollments, while imposing PBF criteria for IHEs that were related to the achievement of certain outcomes or supplemented the enrollment-based formulas with

PBF formulas. Scholars noted that between 1990 and 2010, about 25 states adopted PBF formulas as a way to fund their public 2- and 4-year IHEs, despite scholars' warnings that these models were not effective and may even negatively impact the state's public IHEs in the long run (Tanberg & Hillman, 2014). Additionally, as noted before, research guidance and empirical evidence on how the national unemployment rate may impact college enrollments and success outcomes has been notably missing from the literature. Therefore, public IHEs were faced with the necessity of finding ways to improve their outcomes without much guidance from the scholarly literature on the role that the national unemployment rate may play on impacting those outcomes.

Still, other public IHEs explored alternative venues for revenue generation, starting what came to be known as the "out-of-state gold rush" (Keller & Hoover, 2011; Woodhouse, 2012; Kiley, 2013). The term, coined by The Chronicle of Higher Education in 2011, involves public 4-year IHEs aggressively recruiting and enrolling out-of-state students to make up for lost revenue (Keller & Hoover, 2011; Woodhouse, 2012; Kiley, 2013). In this manner, movement across state borders to get a college education became more of a norm rather than an exception. Therefore, in the current context of examining how the national unemployment rate, rather than state unemployment rates, impacts the decision to attend college may prove to be more relevant and beneficial for scholars, policy makers, and IHE administrators.

In addition to the factors noted above, the national unemployment rate is chosen as the main predictor for this study because it is a highly visible indicator. Specifically, the national unemployment rate gets more attention and coverage in the media, as

compared with other macroeconomic indicators, such as state unemployment rates, the gross domestic product, gross state product, or per capita personal income. In other words, students and parents may not know the state unemployment rate or other macroeconomic indicators, but they are more likely to know the national unemployment rate. Moreover, as mentioned before, public IHEs are aggressively recruiting out-of-state students, and students are crossing state lines to get an education and to access job opportunities. Therefore, examining the role of variations in the state unemployment rate on public universities may provide an incomplete picture of how periods of economic contraction and expansion impact public 4-year IHEs.

Finally, college graduates or bachelor degree holders are more likely to compete in a regional and/or national job market upon graduation as compared with community college graduates or associate degree holders and, therefore, more likely to be aware of and sensitive to the national unemployment rate rather than state unemployment rate. Data provided by the National Information Center for Higher Education Policymaking and Analysis (NCHEMS) shows that, between years 2005 and 2007, the total net migration to other states of bachelor degree holders between the ages of 22 and 39 years for job opportunities was 235,301, while the number of migrants with associate degrees for that same age group was 55,388. Consequently, an examination of the national unemployment rate impact on public 4-year IHEs is warranted.

While the main focus of this study is on evaluating whether a relationship exists between the national unemployment rate and college enrollments and success outcomes, several macroeconomic indicators are included in the statistical models as

control variables. These include gross domestic product, gross state product, per capita personal income at state and national level, and state unemployment rates.

The results of this study can benefit scholars, policy makers, and higher education administrators. The findings presented here will add to the body of scholarly knowledge in the area of institutional outcomes and their connection with unemployment rates. The results of this study also have important policy implications. Specifically, policies may need to be developed to help IHEs cope with variations in the national unemployment rate, offering them a better understanding of their “in-/out-flow” of students as the economy goes through expansion and contraction periods. In addition, these results can help policy makers at the state and federal levels better target subsidies to help IHEs achieve local, state, and national mandates and goals.

Thirdly, the results of this study can provide IHE administrators with valuable planning and forecasting information. Knowing what is likely to happen when the national unemployment rate increases/decreases and which categories of students are likely to be impacted by these variations can provide administrators with valuable information that can be used for planning and resource allocation. Specifically, enrollment management, resource allocation, course offerings, and advising resources can be strategically managed to help the IHE achieve its short and long term goals in terms of enrollment, retention, and completion.

All in all, this study provides a unique contribution to the field of higher education by exploring the relationship between the national unemployment rate and public 4-year IHEs’ success outcomes. The following chapter discusses the statement of

the problem and the study's purpose, theoretical framework, research question, hypotheses, and benefits.

### **Statement of the Problem**

While a variety of factors impacting student enrollment, retention, and completion have been investigated in the literature (Turner 2004; Goldrick-Rab, 2006; Stratton, et al., 2007; Boffy-Ramirez, et al., 2010; Rumberger, 2010), the relationship between factors external to IHEs, such as the national unemployment rate, have received little attention. The relationship between enrollments and the unemployment rate is one exception, having received some attention from scholars (Betts & McFarland, 1995; Black & Sufi, 2002; Dellas & Koubi, 2003; Dellas & Sakellaris, 2003; Boffy-Ramirez, Hansen, & Mansour, 2010). The relationship between retention and the national unemployment rate (Stratton, O'Toole, & Wetzel, 2007) and the relationship between completions (Boffy-Ramirez, et al., 2010; Arkes, 2010; Fry & Parker, 2012) and the national unemployment rate received limited attention in the literature. The following section focuses on examining whether or not a relationship exists between the national unemployment rate and college success indicators (enrollment, retention, and completion).

### **Purpose of the Study**

The purpose of this longitudinal study is to explore the relationship between the national unemployment rate and indicators of college success (enrollment, retention,

and completion), controlling for student characteristics (gender, race/ethnicity, and socioeconomic status) and several macroeconomic indicators such as state unemployment rates, gross domestic product, gross state product, per capital personal income at the national and state level, state appropriations per IHE, federal funds, as well as other variables for all public 4-year universities in the United States. The primary independent variable in the study is the national unemployment rate.

### **Theoretical Framework**

Becker (1962) introduced human capital investment theory, arguing that investments in human capital (such as education, on-the-job training, medical care, and migration) can pay off in the long run in terms of financial, personal, social, and societal returns. Becker later explained that investments in human capital are those “activities that influence future money and psychic income by increasing the resources in people” (Becker, 1993, n.p.) and predicted a positive relationship between education and earnings. Additionally, Becker hypothesized that unemployment and education would have a negative relationship (Becker, 1962, 1993). Higher education scholars have since employed the human capital investment theory framework and found that the incentive to acquire further education is higher during periods of higher unemployment or recessions because the amount of forgone income tends to be lower and, therefore, the opportunity costs also tend to be lower (Betts & McFarland, 1995; Dellas & Koubi, 2003; Perna 2005). All in all, according to human capital investment theory, individuals are more likely to invest in capital development during periods of economic contraction or

higher unemployment rates because the opportunity costs (foregone earnings) are lower during these periods (Betts & McFarland, 1995; Dellas & Koubi, 2003; Dellas & Sakellaris, 2003; Perna, 2005; Arkes, 2010). Plus, investments in education were found to act as a shelter against future unemployment (Becker, 1962, 1993; Betts & McFarland, 1995; Dellas & Koubi, 2003; Dellas & Sakellaris, 2003; Stratton, et al., 2007; Arkes, 2010). In conclusion, this study explores how variations in the unemployment rate impact the accumulation of human capital (i.e., the decision to acquire a college education).

### **Research Question and Hypotheses**

The central research question of the study is: Do national unemployment rates influence college enrollment and success outcomes (retention and completion) at 4-year IHEs in the United States? To address the research question, three sets of hypotheses are tested:

#### **Enrollment Hypotheses**

**Hypothesis 1.** A positive relationship exists between the national unemployment rate and college enrollments.

**Hypothesis 1.A.** A positive relationship exists between the national unemployment rate and male student enrollments.

**Hypothesis 1.B.** The national unemployment rate impacts student enrollment for students from different races/ethnicity groups differently.

**Hypothesis 1.B.1.** A positive relationship exists between the national unemployment rate and college enrollments of White students.

**Hypothesis 1.C.** The national unemployment rate impacts negatively student enrollment for students from the second, third, and fourth socio-economic (SES) quintiles and positively for students from the first and fifth SES quintiles.

### **Retention Hypotheses**

**Hypothesis 2.** A relationship exists between variations in the national unemployment rate and college retention rates.

**Hypothesis 2.A.** The national unemployment rate positively impacts retention rates of full-time students.

**Hypothesis 2.B.** The national unemployment rate negatively impacts retention rates of part-time students.

### **Completions Hypothesis**

**Hypothesis 3.** A positive relationship exists between the national unemployment rate and college completions.

### **Significance of the Study**

This study will benefit scholars, policy makers, and higher education administrators. First, the results add to current scholarly findings in the areas of higher education and economics. The study provides empirical evidence in regards to

institutional outcomes and their relationship with the national unemployment rate. The results of this study will advance the understanding of economists and higher education professionals in regards to the relationship between economic cycles, as measured by the national unemployment rate, and how they impact enrollment, retention, and completion patterns, while controlling for the enrollment profile of the IHE (gender, race/ethnicity, and socioeconomic status), state unemployment rates, gross domestic product, gross state product, per capital personal income at the national and state levels, state appropriations per IHE, and federal funds, as well as other variables.

The study will advance the scholarly research by shedding some light on this relationship as well as providing empirical evidence on how public 4-year IHEs are impacted by the variations in the national unemployment rate. Secondly, the results of the study have important policy implications. Specifically, policies may need to be developed to help IHEs cope with variations in the national unemployment rate, offering legislators a better understanding of how students move in and out of the public IHEs as the economy goes through expansion and contraction periods. Consequently, the results of the study can help policy makers at the state and federal level target subsidies to help IHEs achieve their goals.

Finally, the results of the study will provide IHE administrators with valuable planning and forecasting information. For example, knowing what is likely to happen when the national unemployment rate increases/decreases and which categories of students are likely to be impacted by these variations can provide administrators with

valuable information that can be used for planning. Specifically, enrollment management, resource allocation, course offerings, and advising resources can be strategically managed to help the IHE achieve its short and long term goals in terms of enrollment, retention, and completion even within the context of variations in the national unemployment rate.

### **Definitions of Key Terms**

The following section offers a brief overview of the datasets and variables included in this study. For the complete list of variables and their descriptions, please refer to Appendix A: List of Variables.

Datasets and variables included in the study:

The Delta Cost Project (hereafter DCP) is the main dataset used in this study. It includes pooled time-series panel data collected starting with 1987 until 2010 for all public and private 2- and 4-year IHEs in the United States. The dataset provides information at the institutional level for all the IHEs on an annual basis. Some of the variables tracked in the dataset include total undergraduate enrollment, retention rates, total number of graduates, financial aid information, tuition costs, federal support, institutional size, type, location, Carnegie classification, etc. All the pertinent information is provided at both the undergraduate and graduate levels. This study focuses only on undergraduate-level information for all public 4-year institutions of higher education in the United States.

- The Bureau of Labor Statistics (BLS) tracks information related to unemployment rates at the local, municipal, state, and national levels on a

weekly, monthly, and annual basis. The national unemployment rates and state unemployment rates were gathered and calculated from BLS and paired with the information from the DCP dataset for the years of the study (1987-2010).

- The Bureau of Economic Analysis (BEA) provides information related to a multitude of economic indicators, such as gross domestic product, gross state product, per capita personal income at the national and state levels, and industrial output on a monthly and annual basis at the national, state, and metro area levels. Data for several control variables were pulled from BEA and paired with the DCP dataset.

- The Integrated Postsecondary Education Data System (IPEDS) includes information related to postsecondary institutions in the United States. The dataset includes yearly information on enrollment, retention, completion, financial aid, institutional characteristics, etc., for both public and private 2- and 4- year IHEs. Information related to male and female enrollments for the period between 1987 and 2010 was collected from IPEDS to supplement the DCP dataset, since the DCP dataset includes incomplete information in regards to these two fields.

- Three types of variables are included in this study: dependent variables – enrollment, retention, and completion related variables; a primary independent variable – the national unemployment rate; and control variables. State unemployment rates, national and state per capita personal income, gross

domestic product, state appropriations to IHE, federal financial aid data, and the number of high school graduates for each year are included in this study.

### **Summary**

Overall, this study explores the relationship between the national unemployment rate and college enrollment and success outcomes (retention and completion) for all public 4-year IHEs in the United States. The second chapter is focused on providing the theoretical framework for the study, reviewing the existing literature on the relationship between the unemployment rate and college enrollment, retention, and completion, as well as the main factors impacting these three outcomes. The third chapter discusses the sample, variables, datasets, data sources, validity and reliability, as well as the research question, hypotheses, and statistical models. The fourth chapter focuses on the findings, and chapter five will offer a discussion of the findings and their implications.

## CHAPTER TWO

### LITERATURE REVIEW

The purpose of this study is to explore the relationship between the national unemployment rate and indicators of college success (enrollment, retention, and completion), controlling for the enrollment profile of the IHE (gender, race/ethnicity, and socioeconomic status), state unemployment rates, gross domestic product, gross state product, per capital personal income at the national and state level, state appropriations per IHE, federal funds, as well as other variables for all the public 4-year universities in the United States. This chapter presents a review of the literature and helps situate the study within the scholarly context. First, this chapter presents human capital investment theory, the theoretical framework for the study. Second is a discussion of the scholarly findings of studies that explored the relationship between unemployment rates and college enrollment, retention, and completion rates. The last section presents different factors, beyond unemployment, that impact college enrollment, retention, and completion.

#### Theoretical Framework

Becker (1962) introduced the human capital investment theory arguing that investments in human capital (such as education, on-the-job training, medical care, and migration) can pay off in the long run in terms of financial, personal, social, and societal returns (Becker, 1993, n.p.; Tandberg, Dorius & Cram, 2014). He defined investment in human capital as the “activities that influenced future money and psychic income by

increasing the resources in people” (Becker, 1993, n.p.) and hypothesized a negative relationship between education and unemployment and a positive one between education and earnings “even after netting out direct and indirect costs of schooling” (n.p.). According to the human capital investment theory, earnings should increase with age “at a decreasing rate,” and individuals with higher levels of skill, education, and/or training would be more likely to earn more for a longer period of time. Additionally, Becker theorized that higher levels of skill would insulate against unemployment since employers would have fewer incentive to lay off highly skilled workers in which significant capital was invested (Becker, 1962, 1993).

Later higher education scholars took human capital investment theory a step further, arguing that investments in human capital-- in terms of schooling and, in particular, a college degree-- were more likely to happen during spells of high unemployment, as during these times, the opportunity costs (amount of foregone earnings) were likely to be lower (Betts & McFarland, 1995; Dellas & Sakellaris, 2003; Dellas & Koubi, 2003; Perna 2005; Stratton, et al., 2007; Arkes, 2010). The following section details how higher education scholars employed human capital investment theory to explain the relationship between variations in unemployment rate and demand for schooling at the postsecondary level.

Betts & McFarland (1995) noted that according to the human capital investment theory model, the main factors influencing demand for post-secondary education would be the returns to and costs of obtaining that education and the student’s financial ability to purchase it (Betts & McFarland, 1995). They found that individuals observed

and quickly reacted to labor market conditions by enrolling in community colleges (Betts & McFarland, 1995). Betts and McFarland explained that increases in unemployment rates prompted newly unemployed individuals to invest in education, which, in turn, was expected to protect them against future unemployment (Betts & McFarland, 1995). All in all, the connection between unemployment rates and 2-year college enrollments was found to be positive, and individuals were highly observant of and responsive to variations in the unemployment rates (Betts & McFarland, 1995).

Dellas and Sakellaris (2003) found that once borrowing constraints were eliminated, investments in human capital increased during periods of high unemployment (p. 149). Earning potential was found to be influenced by skill and the business cycles, and individuals who decided to acquire additional education choose “an optimal path” while being aware of the timing and the quantity of investment in human capital (p. 148). In other words, individuals were found to be more likely to invest in higher education during periods of high unemployment.

Following up on Dellas and Sakellaris (2003), Dellas and Koubi (2003) found that human capital investments were more likely to occur during recessions. They argued that schooling decisions were the results of the interaction between the expected rate of return and the availability of financial resources. The expected rate of return was influenced by direct costs (tuition and fees) and indirect costs (opportunity costs – foregone income), as well as by expectations of future employment opportunities and earnings. The ability to finance schooling, on the other hand, was influenced by capital availability, such as personal or family wealth, loans, a part-time job, or student aid (p.

844). Therefore, since the decision to acquire additional schooling or invest in human capital were influenced by the variations in opportunity costs, which were associated with the business cycles, the incentive to acquire education was higher during periods of higher unemployment or recessions (Dellas & Koubi, 2003).

Stratton, et al., (2007) studied college retention rates employing Becker's (1962) human capital investment framework. They found that women were more likely to persist in higher education because they received higher returns to education as compared with men (p. 456). Additionally, age was found to play a central role in the cost-benefit calculations, since opportunity costs were higher for older students later in life. Plus, while the potential for future earnings increased, this increase was at a lower rate and for a shorter time period for older individuals as compared with those who attended college at a younger age (p. 456). Thus, older students were less likely to persist in higher education and had a "lower net benefit of attendance" (Stratton, et al., 2007, p. 456) as compared with younger ones.

Before we move to the next section a few comments are in order. On one hand, Human Capital Investment Theory deals with individuals' decisions to invest in social capital during times of decreased opportunity costs or economic contractions. Therefore the unit of analysis in the theory is the individual. On the other hand, this study focuses on institutions – public 4-year IHEs, and assesses whether they are impacted by the variations in the economic conditions, as measured by the national unemployment rate. Therefore, the unit of analysis for this study is the institution rather than the individual. However, the use of the theory is appropriate for the following reasons. First, Betts &

McFarland (1995) used the theory in a similar manner exploring the relationship between the national unemployment rate and enrollments in 2-year postsecondary institutions. For example, in terms of individuals' decisions, individuals were found to observe and react to the economic environment almost immediately increasing enrollment in 2-year IHEs (Betts & McFarland, 1995).

Second, universities are comprised of individuals and are directly affected by their decisions. Individuals, parents and/or students, make decisions in the context of the information that they are exposed to and have at hand, e.g. variations in the economic cycles, national unemployment rate. Therefore, an argument can be made that the economy and perceptions about the economy influence decision making at the individual level and similar perceptions in individuals can lead to similar outcomes and these outcomes can and do have an impact on IHEs. Specifically, it is likely that when a large number of individuals perceive that the economy as undergoing a period of contraction or recession many individuals are likely to make similar decisions and likely to invest in human capital due to decreases in opportunity costs. Following these decisions, institutions which provide services, in this case universities, are likely to be impacted. In this manner, we argue that similar perceptions can lead to similar decisions which can eventually impact, in this case, postsecondary institutions. Consequently, even though the human capital investment theory has at its core the individual we argue that since individuals' decisions can and do impact institutions, the use of the capital investment theory as the theoretical framework for the study is

appropriate. Therefore, universities are impacted from two directions, the economy and its ebbs and flows as well as by the individuals and their decisions.

All in all, human capital investment theory posits that individuals will be more likely to invest in human capital development during recessions or periods of high unemployment rates because the opportunity cost (foregone earnings) will be lower during these periods (Dellas & Koubi, 2003; Dellas & Sakellaris, 2003; Arkes, 2010). Plus, investments in education were found to act as a shelter against future unemployment (Becker, 1962, 1993; Betts & McFarland, 1995; Dellas & Koubi, 2003; Dellas & Sakellaris, 2003; Stratton, et al., 2007; Arkes, 2010). In conclusion, this study is set to explore how the accumulation of human capital (i.e., the decision to acquire a college education) occurs within the context of variations in the national unemployment rate.

### **Unemployment Rate and Enrollment, Retention, and Completion**

While a number of studies have focused on exploring the relationship between local, state, and/or national unemployment rates and students' predilection to enroll in college (Kane, 1994; Betts & McFarland 1995; Black & Sufi, 2002; Boffy-Ramirez, et al., 2002; Dellas & Sakellaris 2003; Dellas & Koubi, 2003; Arkes, 2010), studies examining the impact that variation in the national unemployment rate can have on public 4-year IHEs are notably absent from the literature. In terms of retention, only one study tangentially explored the relationship between local unemployment rates and college retention rates, finding that the relationship exists and is statistically significant (Stratton, et al., 2007). Therefore this section builds on the assumptions of human capital

investment theory, arguing that 4-year public IHEs may witness increases in enrollment and retention rates when unemployment rates are high and opportunity costs or foregone earnings are low (Dellas & Sakellaris 2003; Dellas & Koubi, 2003; Arkes, 2010). In terms of college completion, I build on Fry & Parker's (2012) argument that higher unemployment rates may lead to higher completion rates. In conclusion, this study is set to explore how public 4-year IHEs are impacted by variation in the national unemployment rate in terms of enrollment, retention, and completion.

### **Unemployment Rates and Enrollment**

Kane (1994) found no relationship between individual enrollment decisions of Blacks and Whites and the annual state unemployment rate. To test this relationship, a cross-section of 18-19 year olds was used from time series data covering the years from 1970 to 1988 from the October supplement of the Current Population Survey.

Betts & McFarland (1995) examined the relationship between national unemployment rates and community college enrollments using linear regression (p. 744). Their dataset comprised information collected between 1969 and 1985 by the United States Department of Education's Higher Education General Information Survey Integrated Postsecondary Education Data System (HEGIS/IPEDS) (p. 748). The sample included all public 2-year colleges (884 institutions) minus the military institutions, colleges in American Territories, federally funded tribal colleges, and extremely small institutions (p. 748). The March Supplements of the Current Population survey were used to calculate the labor market data (p. 748), such as the national unemployment

rates of recent high school graduates and the national unemployment rates of 25-40 year olds. Betts & McFarland found that “community college enrollments rise and fall with the ups and downs of unemployment” (p. 749). In addition, part- and full-time enrollments at community colleges respond differently to variations in the unemployment rate. Full-time enrollments were found to be more sensitive to the unemployment rate, while the part-time enrollments were found to be more sensitive to costs (Betts & McFarland, 1995, p. 759).

Black and Sufi (2002) examined whether Blacks and Whites from different SES backgrounds responded differently to college costs and labor market conditions. The study focused on “both the cross-section and time-series pattern of Black and White college entry for men and women” (p. 6) using a cross section of 18 and 19 year old adults who had completed high school from the March Supplement of the Current Population Survey between 1968 and 1998. The study used local labor market conditions, including the state unemployment rate of individuals 25-40 years old, the state unemployment rate of high school graduates, and the average local wages for both Blacks and Whites (p. 17-8). The study found that local labor market conditions had a “significant impact on college enrollment decisions [of Whites] (and these effects were found to be even stronger among high SES individuals),” while Blacks were found “to be relatively insensitive (or even responded in a way that was negatively related) to local labor market conditions, “with low-SES Blacks being non-responsive to “labor market factors that should encourage college enrollment” (p. 19). It is worth noting that tuition was found to be one of the main factors impacting Black students’ college

enrollment, and a five percent increase in tuition was found to reduce “college enrollment of low SES Blacks by almost 35 percent” (Black & Sufi, 2002, p. 19).

In a similar vein, Dellas and Sakellaris (2003), using 1968-1988 data from the October supplement of the Current Population Survey, examined the relationship between state and national unemployment rates and the propensity to enroll in college, using both time-series and cross sectional data. The study focused on all high school graduates between the ages of 18 and 22 (p. 156). The authors found that college enrollment was countercyclical (p. 157) with a “one percentage point increase in the unemployment rate [being] associated with about a 2% increases in college enrollment” (p. 149). In terms of gender and race/ethnicity the study found no differences in the college enrollment decisions of males and females. However, the study found that “the propensity to enroll for minority individuals [was] less cyclical than for Whites” (p. 164). Furthermore, when examining the manner in which the variations in the unemployment rate influenced high school graduates’ decision to enroll in college part-time versus full-time, they found that both part- and full-time college enrollments were countercyclical and that the probability of full-time enrollment was higher (0.60) than that of part-time enrollment (0.17) (p. 165). Finally, increases in both national and state unemployment rates were found to prompt increases in college enrollments. However, due to sample limitations, the study was unable to provide additional information on students’ propensity to enroll in different types of IHEs, such as public or private 2- or 4-year IHEs. Therefore, it is not clear which types of institutions were more likely to be affected by the variations in the state and national unemployment rates.

Boffy-Ramirez, et al., (2010) used linear regression to examine “the impact of fluctuations in unemployment rates before high school graduation, at age 17, on subsequent educational attainment” (n.p.). The authors used the 1979 National Longitudinal Study of Youth (NLSY79) 1979-1989, with a cross-sample of 17-year-old individuals. The main independent variables were state and national unemployment rates, individual ability as measured by the Armed Forces Qualifying Test (AFQT), parental education attainment, and gender. The dependent variables were college enrollment, graduation, high school drop-out, and total years of education completed. Boffy-Ramirez, et al. found that “worse economic conditions at age 17 increased the probability of college attendance” (p. 4) and “increased years of education” (p. 10). However, the impact of increases in the national unemployment rate varied for students with different abilities (p. 4). Specifically, the probability of attending college was close to zero for students in bottom half of the AFQT ability spectrum but increased for students in the 50<sup>th</sup>-70<sup>th</sup> percentiles of AFQT ability, for a “one percentage point increase in the [national] UR” the probability of [college] attendance increased by about 2-3 percent (p. 4). For the “individuals in the top 20<sup>th</sup> percentile of the ability distribution,” the effect dissipated (p. 4). Additionally, the analysis by gender revealed that “men’s odds of enrolling in college increased by 1.2 percentage points following a 1 percentage point increase in [national or state] UR, with the increase for women being smaller and statistically non-distinguishable from zero” (p. 10). One of the main findings of the study was that the impact “of bad economic conditions [at age 17] vary substantially

over the ability distribution and seem to affect mostly individuals in the lowest percentiles or in the medium-high percentiles [of ability]” (p. 11).

Finally, other studies, such as Humphreys (2000) and Delaney and Doyle (2011), focused on how variations in state appropriations influenced college enrollments and found mixed support when testing the relationship between the state unemployment rate and college enrollments. Specifically, Humphreys (2000), using time-series data from 1969 to 1994, found that full-time equivalent (FTE) enrollments were countercyclical. Alternatively, Delaney and Doyle (2011), using time-series data from the National Center for Educational Statistics from 1984 to 2004, showed that the state unemployment rate had no statistically significant influence on college enrollments.

Overall, the majority of studies that examined the relationship between college enrollment and unemployment rates focused on individuals’ propensity to enroll in postsecondary education. The majority of studies used the Current Population Survey (CPS) dataset, with some studies using the October supplement (Kane, 1994; Dellas & Sakellaris, 2003), while Black and Sufi (2002) and Fry & Parker (2012) used the March supplement of the CPS. These studies looked at time-series data from 1970 to 1988 (Kane 1994), 1968 to 1998 (Black & Sufi, 2002), and 1968 to 1988 (Dellas & Sakellaris, 2003) and built their samples on a cross-section of high school graduates with ages between 18 and 22 years old. The October Supplement has been funded by the National Center for Educational Statistics (NCES) since the 1960s and is administered by the Bureau of the Census and the Bureau of Labor Statistics. The goal of the October Supplement has been to gather “data on school enrollment and educational attainment

for elementary, secondary, and postsecondary education” [October CPS]. The March Supplement of the CPS, also called “CPS Annual Social and Economic” supplement, includes variables that have changed over time (see [https://cps.ipums.org/cps/asec\\_sample\\_notes.shtml](https://cps.ipums.org/cps/asec_sample_notes.shtml)). However, the CPS and the October and March supplements of the CPS have significant shortcomings. Black and Sufi (2002) noted that the March supplement of the CPS only “reports a person’s highest degree attained” (p. 7) rather than actual college enrollment numbers. Additionally, the sample prevents any investigation related to which types of postsecondary institutions are more likely to be impacted by the variations in unemployment rate. Consequently, the CPS data have significant limitations by not being able to offer actual enrollment, retention, and college completion information.

Another study employed the 1979 National Longitudinal Study of Youth (NLSY79) 1979-1989 to test the relationships between the unemployment rate and college enrollments (Boffy-Ramirez, et al., 2010). Schooling decisions were found to be countercyclical, and increases in the unemployment rate prompted increases in the probability of college attendance (p. 4). However, the NLSY data are at the individual level rather than at the institutional level, and, therefore, it is difficult to assess how the IHEs would be impacted by variations in the national unemployment rate based on the results of the Boffy-Ramirez study.

Betts and McFarland (1995) shifted the focus to institutions in examining the relationship between the national unemployment rate and 2-year college enrollments. They used the US DOE’s Higher Education General Information Survey Integrated

Postsecondary Education Data System (HEGIS/IPEDS) dataset to examine the impact of variations in the national unemployment rate on enrollments at 2-year community colleges and found a positive relationship.

All in all, for examining the impact of variations in the national unemployment rate on public 4-year postsecondary institutions, the use of the CPS or the NLSY dataset is not appropriate because they do not focus on institutional level data. Similar to the Betts & McFarland (1995) study, I employ institutional level data, so the Delta Cost Project dataset seems to be the most appropriate to examine the impact of variations in the unemployment rate on public 4-year IHEs over time. Additionally, the present study builds on the Betts & McFarland (1995) study by extending its reach to more recent data, covering the time period between 1987-2010 and examining if this relationship holds for public 4-year institutions. Finally, this study examines the relationship between the national unemployment rate and enrollment patterns by gender, race, and SES to determine whether institutions with different student enrollment profiles (gender, race/ethnicity, SES) are impacted differently by variations in the unemployment rate. Therefore, the following enrollment hypotheses are proposed:

**Hypothesis 1.** A positive relationship exists between the national unemployment rate and college enrollments.

**Hypothesis 1.A.** A positive relationship exists between the national unemployment rate and the enrollment of male students.

**Hypothesis 1.B.** The national unemployment rate impacts student enrollment for students from different races/ethnicity groups differently.

**Hypothesis 1.B. 1.** A positive relationship exists between the national unemployment rate and college enrollments of White students.

**Hypothesis 1.C.** The national unemployment rate impacts negatively student enrollment for students from the second, third, and fourth SES quintiles and positively student enrollment for students from the first and fifth SES quintiles.

### **Unemployment Rate and Retention**

It is rather remarkable to note that while the retention of students has received significant attention in the literature, no study has examined whether variations in the national unemployment rate impact college retention rates. While a large number of studies have focused on what are the main factors impacting retention (which are discussed later in this chapter), only one study has examined the impact of variations in the unemployment rate. Stratton, et al. (2007) examined a list of factors that may impact college retention for full- and part-time students. The Beginning Post-Secondary Survey (BPS) from NCES follows a “stratified random sample of individuals from first enrollment in 1989-1990 to 1992 or 1994” (p. 462) for a final sample comprised of “4655 individuals, 349 of whom were initially enrolled part-time” (p. 463). Local unemployment rates were used in testing for an effect on retention patterns for full-and part-time students. The study found that retention patterns for full and part-time students had a positive relationship with variations in local unemployment rates;

however, the response was statistically significant only for full-time students. In other words, part-time students were found to be less responsive to variations in local unemployment rates.

Therefore, the current study explores whether variations in the national unemployment rate may prompt variations in retention rates. Specifically, I argue that students are more likely to be retained when the national unemployment rate increases, due to job unavailability, and this leads to higher retention rates for public 4-year IHEs. In conclusion, when jobs are scarce and the national unemployment rate is high, public 4-year IHEs are likely to witness higher retention rates. Also, it is important to acknowledge that the focus of this study is at the institutional and macroeconomic level, therefore, the data do not allow for student or individual level controls. Therefore, the following retention hypotheses are proposed:

**Hypothesis 2.** A relationship exists between variations in the national unemployment rate and college retention rates.

**Hypothesis 2.A.** The national unemployment rate positively impacts retention rates of full-time students.

**Hypothesis 2.B.** The national unemployment rate negatively impacts retention rates of part-time students.

### **Unemployment Rate and College Completions**

The literature review revealed that the relationship between unemployment rates (either state or national) and college completion has received little attention from

scholars. To date, two studies have examined the relationship between the state unemployment rate and graduation rates indirectly (Arkes, 2010; Boffy-Ramirez, et al., 2010), and a third study argued that increases in college graduation numbers may be attributed to the Great Recession (2007-2009) (Fry & Parker, 2012).

First, Arkes (2010) used state unemployment rates as instruments to determine returns to schooling, employing the 1980 Census dataset. Arkes (2010) found that the state unemployment rate impacted college degree attainment for individuals who experienced high state unemployment rate during their teenage years but not for those who experienced low state unemployment rate during their teenage years (p. 719).

Second, Boffy-Ramirez, et al. (2010)- reviewed above - used the NLSY 79 and found that a higher unemployment rate at age 17 increased the probability of college graduation for students in the 60<sup>th</sup> to 80<sup>th</sup> ability percentile (n.p.). The study found that for men “a 1 percentage point increase in UR increases a male’s education by 0.16 years on average, and their likelihood of graduating college by 2.9 percentage points if they were in the 4<sup>th</sup> quintile” (p. 11). Additionally, the study found that youth in the “mid to upper part of the ability distribution whose parents attended college [were] the most likely to graduate college when economic conditions were poor at age 17” (p. 12).

Finally, the likelihood of college graduation yielded similar results when the state or national unemployment rates were used (p. 11). All in all, higher national unemployment rate or state unemployment rate at age 17 increased the probability of college graduation for the students in the mid- and upper-ability percentile (Boffy-Ramirez, et al., 2010, n.p.).

Third, Fry and Parker (2012) examined high school and college attainment levels by gender and race/ethnicity over a period of 41 years. Their sample was comprised March CPS data from 1971 to 2012. The study used college graduation rates and found that while, in 1971, the share of 25- to 29-year olds completing 4-year college degrees was 17 percent, it reached 28 percent in 2006. By 2012, that number had reached a record level of 33 percent “for most basic demographic groups” (p. 7). In terms of the gender breakdown of 25- to 29-year olds, the study illustrated a steep increase in college graduation rates for women, from 14 percent in 1971 to 37 percent in 2012, and a slightly lower increase for males, from 20 percent in 1971 to 30 percent in 2012 (p. 9). In terms of the race/ethnicity breakdown, the largest gains in college graduation rates were found for Blacks, from 7 percent in 1971 to 23 percent in 2012, and Hispanics, from 5 percent in 1971 to 15 percent in 2012 (p. 10). For Whites and Asians, the gains were as follows: from 20 percent in 1971 to 40 percent in 2012 and from 44 percent in 1986 to 60 percent in 2012 (p. 10). While the study does not test specifically what may have been the causes for these increases, in regards to the 2006 jump from 28 percent to 2012’s 33 percent in the college graduation rate, the study explains that the Great Recession may have been the reason for this increase (p. 1).

All in all, the relationship between the national unemployment rate and college completion has received little attention in the literature. Following Fry and Parker’s argument, this study bridges this gap by formally examining the impact of the national unemployment rate on public 4-year IHE completions. The following hypothesis is proposed:

**Hypothesis 3.** A positive relationship exists between the national unemployment rate and college completions.

### **Summary**

Overall, the above analysis shows that few and, in some cases, no studies have examined specifically how public 4-year IHEs may be impacted by variations in the national unemployment rate in terms of enrollment, retention, and completion. For exploring the relationship between the UR and enrollment, the study builds on Betts and McFarland's (1995) study by employing institutional level data from the years 1987 to 2010 and focusing on public 4-year IHEs. In terms of retention, studies formally exploring the relationship between the national unemployment rate and college retention are missing. Therefore, this section builds on the assumptions of the human capital investment theory, arguing that students are more likely to attend college – and, hence, universities may witness increases in retention rates -- when unemployment rates are high and opportunity costs or foregone earnings are low (Dells & Sakellaris, 2003; Dellas & Koubi, 2003; Arkes, 2010). In terms of completion, this study builds on Fry & Parker's (2012) argument that higher national unemployment rate may lead to increases in completions. In conclusion, this study explores how public 4-year IHEs are impacted by variations in the national unemployment rate in terms of enrollment, retention, and completion, using institutional level data provided by the Delta Cost project, for the period covering the years from 1987 to 2010, focusing specifically on public 4-year IHEs.

## **Factors impacting Enrollment, Retention, and Completion**

While the previous section focused on reviewing the literature as it relates to the examination of the relationship between unemployment rates and college enrollment and success outcomes, the following section focuses on reviewing the main factors that were identified by scholars to impact these outcomes (enrollment, retention, and completions). These factors are especially important for the development of the model for the regression analysis.

### **Factors Impacting Enrollment**

A review of literature on the factors impacting enrollment showed that three of the most often cited factors were socio-economic status (SES) (Kane, 1994; Turner, 2004; Black & Sufi, 2002; Cameron & Hackman, 2001; Perna & Titus, 2004; Goyette 2008), tuition or college costs (Kane, 1994; Betts & McFarland, 1995; Black & Sufi, 2002; Dellas & Sakellaris, 2003; Turner, 2004), and parental education (Kane, 1994; Turner, 2004; Black & Sufi, 2002; Boffy-Ramirez, et al., 2010; Goyette, 2008).

Turner (2004) found that high income students were more likely to enroll in college and argued that college completions were “expected to rise with family income” (p. 36). Black and Sufi (2002) found that Blacks were more likely to enroll in college than Whites, especially among low-SES individuals, when controlling for family background and found that for high SES individuals a reversed pattern existed (p. 2). Additionally, Cameron and Hackman (2001) found that “family income at ages 15-16 was an important predictor of both college entry and the type of college attended for

Black and Hispanic males (pp. 462-3). Perna and Titus (2004) found that college “enrollment patterns were stratified by SES” and that “low-SES high school graduates [were] less likely than other high school graduates to enroll in any type of college” following high school graduation (p. 518). Finally, Goyette (2008) found that lower-SES students were more likely to delay entry, enter 2-year colleges, and transfer and less likely to graduate than higher-SES students (p. 465).

Tuition or college costs were found to be the second most frequently cited factors to impact college enrollments. Overall, scholars concluded that higher tuition rates had a negative effect on enrollment (Kane 1994, pp. 898-890; Turner, 2004, p. 51), while lower tuition rates had a positive effect on enrollments (Black & Sufi, 2002, p. 18). Additionally, Blacks, independent of SES background, as well as low-SES Whites were found to be sensitive to tuition increases (Kane, 1994, p. 892). Betts and McFarland (1995) found that increases in college costs deterred enrollments and led to decreases in part-time enrollments (p. 759). Black and Sufi (2002) found that for low-SES individuals, both Blacks and Whites, tuition had “a significant impact on college enrollment” (p. 18). Specifically, college enrollments for low-SES Blacks were found to decrease by as much as 35 percent following a 5 percent tuition increase (p. 19). Additionally, while the effect was found to disappear for high-SES Blacks, it was found to hold for all levels of SES for Whites (p. 18). Alternatively, Dellas and Sakellaris (2003) found that college costs “did not have a significant impact on enrollments” (p. 168). Overall, the literature revealed mixed results in estimating the effects of tuition variations on college enrollments.

Parental education is another one of the most relevant factors found to influence college enrollments. Kane (1994) found that “Black youths whose parents were both college graduates had a 85% chance of entering college” and “one of the most important predictors in their attainment ... [was] the attainment of their parents” (p. 903). Black and Sufi (2002) found that due to the fact that Whites were more likely to “have more highly educated mothers” and “higher family income,” they were more likely to attend college (p. 8). Goyette (2008) found that students whose parents attended college were more likely to enroll in college (p. 461) and that parental educational attainment influenced decisions to attend college (p. 467). Similarly, Boffy-Ramirez, et al. (2010) found that youths in “the mid to upper ability distribution, whose parents attended college were more likely to attend college when economic conditions were poor at age 17” (p. 12). Specifically, Turner (2004) found that maternal education “increased the likelihood of college participation by age 28” (p. 37). Overall, the literature revealed a connection between parental educational achievement and college attendance (Kane, 1994; Turner, 2004; Black & Sufi, 2002; Goyette, 2008; Boffy-Ramirez, et al., 2010).

Increases in average weekly earnings in manufacturing were found to negatively impact enrollment in higher education (Kane, 1994; Dellas & Sakellaris, 2003). Average weekly earnings increases were found to prompt decreases in enrollment rates in general (Dellas & Sakellaris, 2003, p. 168) as well as for Black and White males (Kane, 1994, p. 900). Additionally, variations in income wages and/or personal income per capita were found to negatively influence college enrollment (Betts & McFarland, 1995; Humphreys, 2000). First, Betts & McFarland (1995) found that “higher starting wages

for high school graduates” had a negative relationship with college enrollment (p. 754). Second, increases in per capita income prompted increases in part-time enrollments, while decreases in per capita income prompted increases in full-time enrollments (p. 759). Third, Humphreys (2000) found that increases in per capita income prompted decreases in FTE enrollments (p. 404). Therefore, the literature suggests that increases in per capita income deter full-time and FTE enrollments while prompting increases in part-time enrollments (Betts & McFarland, 1995; Humphreys, 2000). Overall, increases in average weekly earnings in manufacturing and/or personal income prompted decreases in postsecondary enrollments (Kane, 1994; Betts & McFarland, 1995; Humphreys, 2000; Dellas & Sakellaris, 2003).

In terms of state appropriations and federal policies regarding financial aid, scholars found mixed support as to these policies impacting enrollment in IHEs (Kane, 1994; Humphreys, 2000; Turner, 2004; Perna & Titus, 2004). Humphreys (2000) found that state appropriations had a minimal connection with enrollments. Alternatively, Perna and Titus (2004) found that increases in state appropriations for public IHEs could help increase in state enrollments while deterring students’ migration to out-of-state IHEs (p. 520). In terms of federal policies, Kane (1994) found that the effect of “deferral grants in affecting enrollment decisions of low-income students” was not clear (p. 900). Alternatively, Turner (2004) found that Pell grants had a substantial impact on enrollments or college participation of both traditional and non-traditional students (p. 51).

Literature revealed mixed results in terms of college enrollments being influenced by race/ethnicity. Specifically, scholars found that “Whites were more likely to go to college on average, have higher family income and have more educated mothers” (Black & Sufi, 2002, p. 8). Dellas and Sakellaris (2003) found “some differences across ethnic groups in the cyclical nature of enrollment” (p. 164) and that “the propensity to enroll for minority individuals is less cyclical than that of Whites” (p. 164). Additionally, Black and Sufi (2002) found that “men are less likely to attend college than women, *ceteris paribus*” (p. 10), while Dellas and Sakellaris (2003) found that “the degree of enrollment cyclical nature is roughly similar for males and females” (p. 164).

Additional factors found to impact enrollment were academic preparation, the size of the high school graduating cohort, and parental status, especially for young women. Perna and Titus (2004) found that academic preparation, “as measured by mathematical course work,” was the strongest predictor for college enrollment (p. 520). Dellas and Sakellaris (2003) found that the “cohort size of students graduating [high school] did not have a significant impact on enrollment” (p. 168). Finally, Turner (2004) found that women having children in their late teens or early twenties were “appreciably less likely to enroll in college” when compared with those without children (p. 38).

In summary, scholars showed that a large number of factors are impacting enrollment, with the most common being socio-economic status (Cameron & Hackman, 2001; Black & Sufi, 2002; Perna & Titus, 2004; Turner, 2004; Goyette 2008), parental education (Kane, 1994; Turner, 2004; Black & Sufi, 2002; Goyette, 2008; Boffy-Ramirez, et

al., 2010), tuition (Kane, 1994; Betts & McFarland, 1995; Black & Sufi, 2002; Dellas & Sakellaris, 2003; Turner, 2004), income wages or personal income per capita (Betts & McFarland, 1995; Humphreys, 2000), and the national unemployment rate (Betts & McFarland, 1995; Dellas & Sakellaris, 2003; Boffy-Ramirez, et al., 2010).

### **Factors Impacting Retention**

The review of literature revealed that some of the most common factors impacting retention in higher education have been socio-economic status (SES) (Goldrick-Rab, 2006; Stratton, et al., 2007; Goyette, 2008), parental status (Turner 2004; Goldrick-Rab, 2006; Stratton, et al., 2007), academic preparation (Turner 2004; Goldrick-Rab, 2006; Stratton, et al., 2007), financial aid (Singell, 2003; Goldrick-Rab, 2006; Stratton, et al., 2007), parental education (Goldrick-Rab, 2006; Stratton, et al., 2007), and race/ethnicity (Goldrick-Rab, 2006; Stratton, et al., 2007). Other factors found to impact retention were diploma type (Turner, 2004), marital status (Stratton, et al., 2007), gender, age, and time of entry (Stratton, et al., 2007), as well as the local unemployment rate (Stratton, et al., 2007).

First, scholars identified SES as one of the most common predictors of college retention (Goldrick-Rab, 2006; Stratton, et al., 2007; Goyette, 2008). Goldrick-Rab (2006) concluded that “social-class background played the strongest role in predicting whether a student engaged in nontraditional postsecondary attendance patterns” (p. 72). Specifically, students from lower SES backgrounds were found to be more likely to interrupt or take time off from college and/or attend multiple institutions

discontinuously (p. 61). Students from middle SES backgrounds were found to be more likely to attend only one institution but also interrupt or take time off from college (p. 72). Finally, students from high SES backgrounds were more likely to attend more than one IHE but were less likely to interrupt or take time off from college (Goldrick-Rab, 2006, p. 72). Additionally, interruptions or taking time off were found to be more common among students with fewer financial resources and lower grades (Goldrick-Rab, 2006, p. 73).

Stratton et al. (2007) found that full-time students coming from the lowest income quartile were almost twice as likely to drop out as compared to students coming from higher income households (p. 471). However, their study does not offer information on whether SES was a strong predictor of college attendance patterns for part-time students (Stratton, et al., 2007). Additionally, Goyette (2008) found that students from “less privileged social backgrounds are more likely to delay entry, more likely to enter 2-year as opposed to 4-year schools, more likely to transfer institutions, and less likely to finish degrees than socially advantaged students” (p. 465).

Interestingly, women having children were found to have more interrupted patterns of college attendance. First, Turner (2004) found that having children in late teens and early twenties could negatively impact college attendance for women. Specifically, young mothers were more likely to have “interrupted spells of college participation” and lower chances of degree attainment (p. 38). Second, Goldrick-Rab (2006) concluded that women were more likely to continuously attend more than one school, without interruption, whereas men were found to be more likely to “interrupt

their enrollment at a single institution” (p. 72). Alternatively, Stratton et al. (2007) found that “the presence of a child at the time of matriculation [or] the arrival of one afterwards were associated with higher attrition rates” for women attending full-time, but this was not found to be true for men attending full-time (p. 475). In terms of part-time students, the presence of children was not as strongly associated with the dropout rate (p. 477).

Academic preparation was also found to be one of the factors significantly impacting college retention (Turner, 2004; Goldrick-Rab, 2006; Stratton, et al., 2007). Turner (2004) found that GED diploma holders were “less likely to persist in higher education” and completed fewer years of postsecondary schooling as compared with high school graduates (p. 40). Students with a low GPA were found to be less likely to persist in postsecondary education (Goldrick-Rab, 2006, p. 72). Stratton et al. (2007) found that full-time students with higher grades were more likely to persist (p. 475), but grades were not significant predictors of persistence for part-time students (p. 477).

Scholars found that financial aid was a mixed blessing for college retention. First, Singell (2003) found that grants and merit aid improved retention, and a positive relationship was found between grants and the probability of retention (p. 467). However, financial aid “that required some immediate form of repayment” (p. 467) and inadequate levels of financial aid were found to increase the probability for drop-out (p. 468). Merit-based aid was found to improve retention (p. 468). Second, students who had to work to attend college had “a 10.7 percent probability of dropping out” (p. 468). All in all, “subsidized, need-based aid” was found to significantly increase “first-year

retention” (Singell, 2003, p. 469). Third, Goldrick-Rab (2006), citing findings from DesJardins, Ahlburg, and McCall (2002), noted that “students who receive adequate levels of financial aid have been found to be less likely to stop-out from school” (Goldrick-Rab, 2006, p. 73). Fourth, Stratton, et. al., (2007) found that full-time students receiving grant aid were less likely to drop out as compared with students receiving loans and students not receiving any type of aid (p. 476). Finally, full-time students receiving work-study funds were found to be less likely to drop out (Stratton, et al., 2007, p. 476). All in all, scholars found that different types of financial aid impacted college retention rates in different ways.

Stratton et al. (2007) found that parental education impacted student retention in different ways. Specifically, full-time students “coming from households with less educated parents were significantly more likely to drop out” (p. 471). On the other hand, part-time students whose parents were high school dropouts were more likely to drop out or interrupt their college studies (p. 477). Goldrick-Rab (2006) found that students whose parents went to college had a better ability to change schools while maintaining enrollment (p. 73). Therefore, parental education was found to be a significant factor impacting college retention.

Goldrick-Rab (2006) found no differences in college attendance patterns by race/ethnicity (p. 72). Race/ethnicity was found to not be a significant factor in the retention of full-time students (Stratton, et al., 2007, p. 478). However, for part-time students, race/ethnicity was found to be a significant predictor of retention, with

Hispanics and non-Black/non-White individuals enrolled part-time being more likely to drop-out (Stratton, et al., 2007, p. 478).

Finally, scholars found that the marital status, diploma type, gender, age, time of college entry, and local unemployment rate played a role in college attendance patterns. For example, Stratton et al. (2007) found that marital status was an important predictor of college dropout, noting that “women and especially men [attending college full-time] who got married while in college were significantly more likely to drop out” (p. 475) and concluded that marital status changes have a differential impact on full-time versus part-time students (p. 477). Furthermore, Stratton et al. (2007) found that gender, age, and time of matriculation were significant predictors of college attendance. Specifically, women were found to have a significantly higher probability of dropping out than men, while age had a “positive effect on men’s probability of dropping out and a negative effect on women’s” for full-time students (p. 471). However, in terms of part-time students “neither gender nor age” was found to be a significant determinant of attrition (p. 477). In terms of time of matriculation, Stratton et al. (2007) found that full-time students “men and women who started in the fall term or matriculated immediately after high school” were less likely to drop out as compared with those who delayed college entrance (pp. 471-5). However, for part-time students, time of college entry was not found to be “a statistically significant predictor for attrition” (p. 477).

Turner (2004) found that there is a difference in college attendance patterns for high school diploma recipients and GED recipients. Specifically, GED recipients were found to be less likely to persist in college as well as more likely to complete fewer years

of a college education compared with high school diploma recipients (p. 40). Finally, Stratton, et al. (2007) found that local unemployment rates had an impact on college attendance patterns. Specifically, a negative relationship was found between the local unemployment rate and the predilection to interrupt college studies for full-time students (p. 457). In terms of part-time students, Stratton et al. (2007) found a positive but not significant relationship between local unemployment rates and attrition rates (p. 478).

In conclusion, the most common factors impacting retention in higher education were socio-economic status (SES) (Goldrick-Rab, 2006; Stratton, et al., 2007; Goyette, 2008), parental status (Turner 2004; Goldrick-Rab, 2006; Stratton, et al., 2007), academic preparation (Turner 2004; Goldrick-Rab, 2006; Stratton, et al., 2007), financial aid (Singell, 2003; Goldrick-Rab, 2006; Stratton, et al., 2007), parental education (Goldrick-Rab, 2006; Stratton, et al., 2007), and race/ethnicity (Goldrick-Rab, 2006; Stratton, et al., 2007). Other factors found to impact retention were diploma type (Turner, 2004), marital status (Stratton, et al., 2007), gender, age, and time of entry (Stratton, et al., 2007), and the local unemployment rate (Stratton, et al., 2007). It is interesting to note that variations in college costs or tuition were not found to impact retention rates, as variations in tuition costs were found to be significant predictors of college enrollment and completion (Kane, 1994; Betts & McFarland, 1995; Black & Sufi, 2002; Dellas & Sakellaris, 2003; Turner, 2004).

## Factors Impacting College Completion

Some of the most common factors identified in the literature as impacting college completion are socio-economic status (SES) (Turner, 2004; Goldrick-Rab, 2006; Goyette, 2008; McPherson & Shulenburg, 2010; Rumberger, 2010; Roksa, 2011), ability or academic preparation (Turner, 2004; Goldrick-Rab, 2006; Boffy-Ramirez, et al., 2010; Rumberger, 2010), parental education (Kane, 1994; Turner, 2004; Roksa, 2011), starting college at a 2- or 4-year institution and institutional selectivity (Perna & Titus, 2004; McPherson & Shulenburg, 2010; Roksa, 2011), and state appropriations (Turner, 2004; Delany & Doyle, 2011). Other factors include federal policy, e.g., Pell grants, parental status, tuition, and cohort size (Turner, 2004), as well as race\ethnicity (McPherson & Shulenburg, 2010), the national unemployment rate (Boffy-Ramirez, et al. 2010), state unemployment rates (Arkes 2010), and employment intensity while in college (Roksa, 2011).

The most common factor discussed in the literature as impacting college completion is socio-economic status (SES) (Turner, 2004; Goldrick-Rab, 2006; Goyette, 2008; McPherson & Shulenburg, 2010; Rumberger, 2010; Roksa, 2011). Scholars have found that “college participation and college completion were expected to rise with family income” (Turner, 2004, p. 36), and college completion rates varied by family income (McPherson & Shulenburg, 2010, p. 55; Rumberger, 2010; Roksa, 2011). Similarly, Goldrick-Rab (2006) found that students from lower SES backgrounds were “following pathways in college that [were] unlikely to lead to college completion” (p. 73) while the ones from high SES backgrounds were more likely to complete college.

Goyette (2008) found that students from less “privileged social backgrounds were more likely to delay entry, more likely to enter 2-year as opposed to 4-year schools, more likely to transfer institutions, and less likely to finish degrees than socially advantaged students” (p. 465). Rumberger (2010) noted that “60% of upper class [SES] students completed college, compared to only 7% of lower class [SES] students” (p. 252). However, SES was found to have no “direct impact on college completion for Hispanic and Asian males” (Rumberger, 2010, p. 253). Similarly, McPherson & Shulenburg (2010) found that completion rates “differ significantly by race” (p. 55). Therefore, research asserts that college completion rates are strongly influenced by family income or SES.

The second most common factor identified by scholars as having an impact on completion rates is parental education. Kane (1994) noted that “one of the most important predictors of educational attainment of youths has been the attainment of their parents” (p. 903). Similarly, Turner (2004) found that mothers who completed college were more likely to have their children complete college (p. 37). Additionally, “students whose parents held graduate/professional degrees had 44% higher odds of earning bachelor’s degrees and 26% higher odds of competing any educational credentials (either associate or bachelor’s degrees) [...] than those whose parents had no college experience” (Roksa, 2011, p. 300). Overall, students whose parents completed at least a college degree were found to have a higher probability of completing college.

Academic preparation and academic ability were found to be significant factors impacting college completions. Turner (2004) found that “changes in characteristics of

individuals – both financial and academic – affect collegiate attainment” (p. 33). Additionally, Goldrick-Rab (2006) argued that students with poorer academic preparation were “following pathways in college that were unlikely to lead to college completion” (p. 73). Finally, Rumberger (2010) noted that college test scores and especially grades were powerful predictors of college completion (p. 253). Overall academic ability and/or preparation were found to be strong predictors of college completions.

Scholars found that time of entrance to an IHE, entering a 2- versus 4-year IHE, and IHE selectivity played an important role in degree attainment (Perna & Titus, 2004; McPherson & Shulenburg, 2010; Roksa, 2011). First, Perna and Titus (2004) found that enrolling in a 4-year IHE immediately after completing high school increased the probability of college degree attainment (p. 519). Second, McPherson and Shulenburg, (2010) found that “completion rates vary directly with institutional selectivity” (p. 55). Finally, Roksa (2011) found that students starting at community colleges “had 76% lower odds of earning a bachelor’s degree than those starting at 4-year institutions” (p. 300). Overall, enrolling in a 4-year IHE immediately following high school increased a student’s chances of earning a baccalaureate degree.

Research shows mixed support in regards to the relationship between state appropriations and college completions (Turner, 2004; Delany & Doyle, 2011). Turner (2004) found that “increasing (decreasing) the share of state appropriations to 4-year institutions has a strong positive (negative) effect on completion, with a 5 percentage point decrease in the share of appropriations directed to institutions associated with a

1.7 percentage point decrease in college completions” (p. 43). However, Delany & Doyle (2011) found no connection between variations in state appropriations to higher education and number of degrees awarded.

Turner (2004) found that federal policy, parental status, tuition variations, and cohort size impacted college completion rates. Specifically, Pell grants did not increase college completions for students. Second, the parental status of women was found to significantly impact college completions-- mothers having significantly less time to study, increased chances for dropout, and overall “low levels of college completion” (p.38). Third, variations in tuition were found to negatively impact “college completions and time to degree” (p. 30). Finally, Turner (2004) found that increases in cohort size prompted increases in college enrollment and, consequently, “increases in the fraction of the cohort attaining a college degree” (p. 18).

Scholars found that race/ethnicity, the national unemployment rate, state unemployment rates, and being employed while in college were also impacting college completions. First, McPherson & Shulenburger (2010) concluded that college completion rates differed significantly by race/ethnicity (p. 55). Second, Boffy-Ramirez, et al. (2010) found that national unemployment rate impacted the rate of college completion for students in the highest quintiles of ability, as measured by the Armed Forces Qualitative Test, as well as those individuals who experienced high national unemployment rates at age 17 (p. 11). Similarly, Arkes (2010) found that state unemployment rates impacted college degree attainment for individuals who experienced high state unemployment rates during their teenage years, but not for

those who experienced low state unemployment rates during their teenage years (p. 719). Finally, students who worked less than 20 hours a week during their college years were more likely to complete college, while the ones who worked 35 hours or more a week were found to be less likely to graduate from college (p. 300).

All in all, a variety of factors have been identified by researchers as having an impact on college degree attainment (Turner, 2004; Goldrick-Rab, 2006; Goyette, 2008; McPherson & Shulenburg, 2010; Rumberger, 2010; Roksa, 2011). Out of these factors, the most commonly identified were students' socio-economic background (SES), ability and academic preparation, parental education, starting college at a 2- versus -year institution and institutional selectivity. Other factors impacting college degree attainment were federal policy in regards to financial aid, state appropriations, national and state unemployment rates, race/ethnicity, parental status, and the number of hours worked per week while attending college.

The review of literature as it relates to factors impacting college enrollment, retention, and completion shows that, overwhelmingly, socio-economic status is a strong predictor of enrollment retention and completion and that lower SES students have lower chances of enrollment, persistence, and completion when compared with students from more advantaged family backgrounds.

The Delta Cost Project (DCP) dataset used for the current analysis facilitates the development of models that can employ national, state, and institutional level information to assess the impact of the national unemployment rate on college enrollment and success outcomes. While information on student level factors identified

in the literature as having an impact on college enrollment and success outcomes, such as a student's parental or marital status or employment intensity while in college, are not captured in the DCP, the DCP provides important information at the institutional level that makes comparison at the national and state level possible and facilitates the generalizability of the findings.

### **Summary**

This chapter illustrated the theoretical framework for the study, examined the literature as it relates to unemployment rates and college student outcomes (enrollment, retention, and completion), and provided a list of institutional and student level factors that have an effect on these outcomes. The study employs human capital investment theory as its theoretical framework. This theory posits that investments in human capital can protect against unemployment and increase earnings (Becker, 1962, 1993). Therefore, periods of high unemployment would be more conducive to human capital accumulation, in this case a pursuing a college degree, because the opportunity costs (the amount of foregone income) would be lower during these periods (Betts & McFarland, 1995; Dellas & Sakellaris, 2003; Dellas & Koubi, 2003; Perna 2005; Stratton, et al., 2007; Arkes, 2010). The review of the literature showed that an assessment of the impact of the variations in unemployment rates on public 4-year IHEs was still absent from the literature. Additionally, a need to examine if the findings of previous studies still hold for the new students was identified, as many studies reviewed in this chapter relied on slightly dated data. As an example, the most recent dataset used focused on

the years up to 1998 (Black & Sufi, 2002). Similarly, the study that forms the basis for exploring the relationship between unemployment rates and enrollments (Betts & McFarland, 1995) was published more than 15 years ago and uses data older than 25 years (1969-1985). An update is in order, since the last 25 years witnessed significant changes in terms of access to information, higher education policy, and macroeconomic shifts. First, one of the major changes was driven by access to information. The advent of the Internet and World Wide Web enhanced access to information and arguably had an effect on decision-making processes. In particular, it provided students and parents with needed information regarding college selection and attendance, as well as unemployment rates. Therefore, information availability positively impacted decision making processes since people have been unlikely to base their decisions on information received only from other people and/or media channels like radio or TV. The advent of the information age brought about changes in information access, and it can be argued that it has been informing decision-making in every aspect of people's lives, including college attendance, persistence, and graduation (Cooke, 2003).

Additionally, the 1980s, 1990s, and 2000s were marked by significant shifts in higher education policy. For example, if, during the 1970s, higher education was heavily reliant on grants, by the mid-1980s, higher education was more heavily reliant on loans. The 1990s saw the introduction and use of tax credits, designed to benefit the middle class (St. John, 2003). The 2000s witnessed major shifts in funding, spanning a period when state subsidies for higher education decreased and the burden for paying for higher education was placed heavily on students and their families (The Chronicle

of Higher Education, 2014). In conclusion, higher education has witnessed a shift from access to affordability and then from affordability to cost sharing during the last 25 years. Consequently, the evolution of higher education during the last 25 years deserves attention and this study focuses on 24 of these years.

From a macroeconomic perspective, the National Bureau of Economic Research has identified a total of three recessions occurring between 1987 and 2010 – the early 1990s recession, when the unemployment rate peaked at 7.8% in June 1992; the early 2000s recession, when the unemployment rate peaked at 6.3% in June 2003, and the Great Recession, when the unemployment rate peaked at 10.0% in October 2009 (NBER, BLS). Due to these significant changes, this period between 1987 and 2010 deserves the attention of scholars.

All in all, the scarcity of studies examining the relationship between unemployment rates and retention, as well as completion rates, warrants the need for a study such as this one. Firstly, scholars, IHE administrators, and policy makers can benefit from knowing how unemployment rates impact public 4-year institutions in their state. Secondly, they can plan for these impacts and develop policies and regulations for how IHEs can embrace and thrive during times of increased unemployment and college enrollments. All in all, this study is set up to provide timely and up-to-date information that can help IHE stakeholders strategically plan for better IHEs, forecast demand on resources, and provide students with needed services.

## CHAPTER THREE

### METHODS

The purpose of this study is to explore the relationship between the national unemployment rate and indicators of college success (enrollment, retention, and completion), controlling for the enrollment profile of the institution of higher education (IHE) (gender, race/ethnicity, and socioeconomic status composition), the gross domestic product, per capita personal income at the national level, state appropriations per IHE, and federal funds, as well as other variables, for all the public 4-year universities in the United States. The following chapter discusses the population and sample, variables, instrumentation, statistical methods employed, and the research question, as well as the statistical models for each hypothesis.

#### **Population and Sample**

This study examines the relationship between the national unemployment rate and college enrollment and success outcomes. The review of the literature showed that studies examining the relationship between unemployment rates and undergraduate enrollment, retention, and/or completion have focused on aggregate data from the March or October Supplements of the Current Population Survey (Kane 1994, Black & Sufi, 2002; Dellas & Sakellaris, 2003; Fry & Parker, 2012) or individual level data from the 1979 National Longitudinal Study of Youth (NLSY79) (Boffy-Ramirez, et al., 2010). Only Betts & McFarland (1995) focused on institutional-level data for public 2-year IHEs, using (HEGIS/IPEDS), and found that increases in the unemployment rate

prompted increases in enrollment and the number of certificates awarded. Therefore, there is a need in the literature to evaluate the impact of variations in the national unemployment rate on 4-year public IHEs in the U.S. in terms of student enrollment, retention, and completions. The data for this study come from six different sources.

The main source of data used in this study is the Delta Cost Project (DCP) dataset. The DCP was set up to “provide policymakers, higher education administrators, and the general public with analyses and resources to deepen understanding of what colleges do with their money” ([DCP], n.p.). The DCP tracks institutional-level information that was matched over time by National Center for Educational Statistics analysts. The “Center for Education Statistics is maintaining the Delta Cost Project’s database as part of its Integrated Postsecondary Education Data System (IPEDS). IPEDS conducts annual surveys gathering information from every college, university, and technical and vocational institution that participates in the federal student financial aid programs” [DCP]. The DCP database collects information on undergraduate enrollment, retention, and completions; revenues, such as tuition and fees, federal financial aid, state and federal appropriations, state and local contracts and grants, expenditures, faculty information, institutional assets; and so on. Finally, the DCP dataset tracks information at the institutional level from 1987 to 2010, and it seems to be the most appropriate tool for evaluating the impact of variations in the unemployment rate on 4-year public IHEs in the U.S. An alternative tool that may have been considered for this task is IPEDS. However, while the IPEDS dataset tracks

information at the institutional level as well, it only includes data starting with 2003 going forward.

The DCP dataset includes pooled time-series panel data collected starting with 1987 for all public and private 2- and 4-year IHEs in the United States. However, for the purpose of this study, I focus on public 4-year IHEs and undergraduate students enrolling for and working towards earning a baccalaureate degree. Therefore, information regarding enrollment for and completion of certificates, associate, graduate, and/or first professional degrees was excluded from the sample. The DCP dataset offers institutional-level information for all public 4-year institutions of higher education (IHE) in the United States from 1987 to 2010, with a total number of observations of 12,624, but this number will vary by research question and hypothesis.

The second data source employed in this research comes from the Bureau of Labor Statistics (BLS). The BLS tracks unemployment rates at local, municipal, state, and national levels on a weekly, monthly, and annual basis. The unemployment rate includes “people who aren't working or looking for work, but want a job, and those who are working part-time because they can't find a full-time position” [BLS]. The national unemployment rate is calculated using the Current Population Survey, which is conducted monthly and measures the “extent of employment in the country,” and its “sample is selected so as to be representative of the entire population of the United States” [BLS NUR]. About 60,000 households are included in the sample of this survey, for a total of approximately 110,000 individuals [BLS NUR].

The third data source employed in this study is provided by the Bureau of Economic Analysis (BEA). The BEA provides information as it relates to a multitude of economic indicators, such as gross domestic product, gross state product, per capita personal income at the national and state levels, industrial output, etc., on a monthly and annual basis.

The fourth data source employed is the Integrated Postsecondary Education Data System (IPEDS) itself. The IPEDS includes information related to postsecondary institutions in the U.S. The dataset includes yearly information on enrollment, retention, completion, completions, financial aid, institutional characteristics, for both public and private 2- and 4- year IHEs.

The fifth source of data is the United States Census Bureau (US Census). The US Census collects data, such as the population and housing census, economic data, population data, economic data, and data on educational attainment, from the U.S. population on a regular basis. Data collected by the US Census as it relates to the education attainment includes the percentage of the population completing four years or more of college or a college degree. The educational attainment data are intended to be used as a proxy for parental education.

The final data source was the United State Department of Education (USDOE). The USDOE provides data at the individual and institutional level. These data include enrollment, progression, and completion, as well as information as it relates to federal appropriations, federal financial aid, and state appropriations for K-20 educational institutions in the United States. All in all, data from these datasets were paired with the

DCP data to form the dataset that is used for studying the central research questions and the hypotheses of the study.

### **Variables in the Analysis**

The following section defines the three sets of variables – dependent, independent, and control – that are included in the study. Their inclusion in the study is warranted by previous scholarly findings, as they relate to factors impacting the dependent variables for this study: college enrollment, retention, and completion. The main independent variable of the study is the national unemployment rate. Finally, the control variables include variables such as state unemployment rates, per capita personal income, gross domestic product, and the size of the cohort of high school graduates, as well as institutional level variables such as state appropriations and federal financial aid.

#### **Dependent variables**

A number of dependent variables are included in this study, divided into three main sets: enrollment, retention, and completion. The following section explains the dependent variables that are included in the study.

**Enrollment.** The first set of dependent variables deals with enrollment. Enrollment refers to the number of students “participating at a given educational level at a single point in time” (Turner 2004, p. 16). For the purpose of this study, the focus is on the total number of students enrolled, the total number of male and female students

enrolled, and the total number of students by race/ethnicity, socioeconomic status enrolled in public 4-year IHEs.

**Retention.** The study employs two retention variables. The retention rates measure the percentage of students that persisted from the fall of one academic year to the fall of the next academic year [DCP definitions]. The DCP tracks full- and part-time retention rates by institutions by year.

**Completions.** The third set of dependent variables includes only one variable, namely the total number of degrees awarded by an IHE each year.

### **Independent Variable**

The national unemployment rate is the only independent variable included in this study. The national unemployment rate is calculated by the Bureau of Labor Statistics (BLS) using the Current Population Survey, which is conducted monthly and measures the “extent of employment in the country,” and its “sample is selected so as to be representative of the entire population of the United States” [BLS NUR].

### **Control Variables**

This section includes a brief discussion of the control variables that have been identified by scholars as impacting college enrollment, retention, and completion. While some of these variables relate to factors outside of the institution, such as macroeconomic conditions, others relate to the institutions themselves.

**Macroeconomic variables.** The literature review identified a variety of macroeconomic variables that impact college enrollment and success outcomes. These include state unemployment rates (Kane, 1994; Dellas & Sakellaris, 2003; Stratton, et al., 2007), per capita personal income (Betts & McFarland, 1995; Humphreys, 2000), and the gross domestic product (Dellas & Sakellaris, 2003).

The Bureau of Labor Statistics (BLS) tracks state unemployment rates on a monthly basis for each state, region, and census region. Annual state unemployment rates were calculated by averaging the monthly rates and pairing them with the states included in the DCP dataset.

Per capita personal income (PCPI) is provided by the Bureau of Economic Analysis (BEA) and represents the average dollar amount of income per person. The data are provided on a monthly and annual basis for all “states, counties, metropolitan areas, micropolitan areas, metropolitan divisions and combined statistical areas” [BEA]. The annual PCPI at the national level and the annual PCPI at the state level are included as control variables in the analysis.

The Gross Domestic Product (GDP) is also tracked by the BEA on a quarterly and annual basis by metropolitan area, state, and national levels [BEA]. For the purpose of this study, the annual GDP values at the national level are used. Additionally, the Gross State Product values per year are included in the analysis.

Finally, the annual number of public high school graduates is included in the analysis as a control variable. The National Center for Educational Statistics (NCES)

keeps track of the total number of public high school graduates by state and at the national level on an annual basis.

**Institutional variables.** The literature review identified a variety of institutional level variables as having an impact on college enrollment and success outcomes. These include tuition or college costs (Kane, 1994; Betts & McFarland, 1995; Black & Sufi, 2002; Dellas & Sakellaris, 2003; Turner, 2004), state appropriations (Humphreys, 2000; Perna & Titus, 2004; Turner, 2004; Delany & Doyle, 2011), and federal policies (Kane, 1994; Turner, 2004). Some of these variables impact all three success outcomes, while some of them impact only one or two.

The Delta Cost Project includes information related to tuition costs and state appropriations. The tuition and fees dollar amounts for both in-state and out-of-state students, as well as the dollar amount of state appropriations for each IHE received per year, are included as control variable in the analysis.

The dollar amount of federal Pell grants, loans, and work-study funds are included as control variables for each IHE. The information for these three variables is provided by the United States Department of Education for each IHE receiving federal funds under Title IV.

Overall, this section discussed the three sets of variables – dependent, independent, and control – included in this study and employed in developing models for hypothesis testing. Their inclusion in the study is warranted by previous scholarly findings as they relate to factors impacting college enrollment, retention, and

completion, as well as by human capital investment theory. The dependent variables include enrollment, retention, and completion-related variables. The main independent variable of the study is the national unemployment rate. Finally, the control variables include variables such as the state unemployment rate and per capita personal income at the national level, as well as at the state level, gross domestic product, gross state product, and the number of high school graduates from public high schools, as well as institutional level variables such as state appropriations, in-state and out-of-state tuition and fees, and federal funds.

### **Validity and Reliability**

Berman (2006) noted that measurement validity refers to the fact that the variables measure what they are intended to measure. In terms of this study, data for the variables included was collected to meet the needs of the categories initially selected; therefore, due to the dataset selection and the data collection methods employed, the study meets the criteria of validity. The proposed study does not employ any constructs; therefore, there is no discussion of data elements as they relate to construct validity. In terms of external validity, the study is set up to cover all the public 4 year IHE as collected by IPEDS. However, the IPEDS dataset has certain limitations, as noted by Cook & Pullaro (2010), which are discussed in the study limitations section. Therefore, the findings of this study may not be generalizable to either public or private public 2-year IHEs, and/or private 4-year IHEs. Additionally, the findings of this study may not be generalizable to IHEs outside of U.S. since each country has unique

economic, demographic, and social patterns. For example, Sakellaris and Spilimbergo (1999) found that for non-OECD (Organization for Economic Cooperation and Development) countries, enrollment patterns are pro-cyclical; i.e., college enrollment increased with economic expansion (Sakellaris & Spilimbergo, 1999, n.p.). All in all, the findings of this study are generalizable for public 4-year IHEs; however, this generalization should be made with great caution and keeping in mind the DCP dataset limitations.

Berman (2006) defined reliability as "the extent to which repeated measurements produce the same result" (p. 88). The reliability of the study is ensured by the data collection methods. In other words, collecting the data for the same period of time following the same specifications (field definitions) will supply the same results; therefore, the study has high reliability.

### **Data Analysis and Statistical Models**

A pooled time-series panel data analysis technique was employed to analyze the impact of the national unemployment rate (NUR) on college enrollment and success outcomes for all public 4-year IHEs in the United States. Panel data are data that follow a given set of institutions over time and provide multiple observations on each institution in the sample (Hsiao, 2003). Zhao, Ren, & Lovrich (2012) noted that "panel data models have long been considered the preferred method for the study of causation" (p. 178), and Campbell and Stanley (1967) argue that "panel models are

excellent quasi-experimental designs, perhaps the best of the more feasible designs” (p. 178).

A two-factor fixed-effects panel data analysis approach is used to determine the static and dynamic approaches to the prediction of college enrollment and success outcomes. The two-factor fixed-effects panel data analysis “allows for unobserved systematic (non-random) variation to be controlled for in the longitudinal analysis” (Zhao, et al., p. 178). The two-factor approach takes care of the institutional component, for each institution included in the study, and the state component, represented by 50 states, corresponding to observations for each institution from each state. The institutional component, or the first factor, is examined by including a dummy variable for each IHE, and the difference in college enrollment and success outcomes (retention and completion) caused by unobserved variance occurring in each IHE (p. 179). This factor is noted as  $W_i$ , where  $W_i=1$  for  $i^{\text{th}}$  institution,  $i=1, \dots, N$ ; and 0 otherwise. The second factor (the state component) involves the inclusion of state dummy variables that allow control for unknown factors, such as omitted variables affecting the dependent variables of the study, which are not accounted by the predictors of the study (p. 179). The second factor is  $Z_s$ , where  $Z_s=1$  for  $s^{\text{th}}$  state,  $s=1, \dots, 50$ ; and 0 otherwise. Both of these factors are included in the models proposed below.

Standardized regression coefficients, or beta coefficients, are used to determine the independent variables that have the greatest impact on explaining variations in the dependent variables (Berman & Wang, 2012). They are used in multiple regression models as a way to facilitate comparison across independent variables by ignoring

measurement units. Specifically, all variables - dependent and independent - in the model are standardized by “subtracting the mean and dividing by the standard deviation.” Therefore, “standardized regression coefficients represent the change in response for a change of one standard deviation in a predictor” ([SC], n.p.). This project employs SAS software for statistical analysis. Since, in SAS, standardized coefficients are referred to as standardized estimates, standardized estimates will be the term used from this point forward, even though their notation will be  $\beta$ .

The following section includes the hypotheses and proposed models for the study. Given the fact that we deal with one dependent variable at a time and, in many cases, with a variety of predictors or independent variables, the use of multiple linear regression is appropriate as a statistical method for testing the proposed hypotheses.

The following research question is central to the study, and three sets of hypotheses aid in addressing it.

Research Question: Do national unemployment rates influence college enrollment and success outcomes (retention and completion) for 4-year IHEs in the United States?

The following notations are used for all the following statistical models included in the hypotheses below:

- $\beta$  represents the standardized regression coefficient or the standardized estimate for each independent variable.
- NUR - represents the national unemployment rate at times  $t$ , NUR1 at time  $t-1$  and NUR2 at  $t-2$ ,
- GDP - is the annual gross domestic product at times  $t$ , GDP1 at time  $t-1$ ,

- PCPI – is the per capita personal income at the national level at time  $t$ , PCPI1 at time  $t-1$ ,
- InState\_TF – is the in-state tuition and fees charged by institution  $i$  at time  $t$ ,
- OutState\_TF – is the out-of-state tuition and fees charged by institution  $i$  at time  $t$ ,
- StateAppr – is the amount of state appropriations received by institution  $i$  at time  $t$  in state  $s$ ,
- PellAmount – is the amount of dollars in the form of federal Pell grants received by institution  $i$  at time  $t$ ,
- HiSc – is the total number of high school graduates at time  $t$  at the national level,
- EDA – percent of the population 18 year or older that completed a bachelor degree or higher at the national level at time  $t$ .
- $Z_s$  represents the fixed effects factor for state  $s$ ,  $Z_s=1$  for  $s^{\text{th}}$  state,  $s=2, \dots, 50$ ; and 0 otherwise,
- $W_i$  represents the fixed effects factor for institution  $i$ ,  $W_i=1$  for  $i^{\text{th}}$  institution,  $i=2, \dots, N$ ; and 0 otherwise, and
- $\epsilon_{it}$  represents the error
- $C_{it}$  represents the equation for control variables.

$$C_{it} = \beta_4 GDP + \beta_5 GDP1 + \beta_6 PCPI + \beta_5 PCPI1 + \beta_6 InState\_TF + \beta_7 OutState\_TF + \beta_8 StateAppr + \beta_9 Pell + \beta_{10} HiSc + \beta_{11} EDA$$

Table 3.1. Hypotheses

| Hypothesis | Dependent Variable                | Relationship Direction | Independent Variable |
|------------|-----------------------------------|------------------------|----------------------|
| 1.         | College enrollments               | +                      | NUR                  |
| 1.A.       | Male enrollments                  | +                      | NUR                  |
| 1.B.       | Race/ethnicity enrollments        | +/-/no relationship    | NUR                  |
| 1.B.1.     | Whites enrollments                | +                      | NUR                  |
| 1.C.       | SES quintiles 1 & 5 enrollments   | +                      | NUR                  |
|            | SES quintiles 2,3 & 4 enrollments | -                      | NUR                  |
| 2.         | Retention rate                    | +                      | NUR                  |
| 2.A.       | Full-time retention rate          | +                      | NUR                  |
| 2.B.       | Part-time retention rate          | -                      | NUR                  |
| 3.         | Completions                       | +                      | NUR                  |

### Enrollment Hypotheses

The following enrollment hypotheses are proposed:

**Hypothesis 1.** A positive relationship exists between the national unemployment rate and college enrollments.

The  $ENR_{it}$  variable represents the total number of undergraduate students enrolled at an IHE in a specific year, or total college enrollment in institution  $i$  at time  $t$ .

To determine whether a positive relationship exists between the national unemployment rate and total college enrollments the following model is proposed:

**Equation 3.1:** NUR and total college enrollments

$$ENR_{it} = \beta_1 NUR + \beta_2 NUR1 + \beta_3 NUR2 + C_{it} + Z_s + W_i + \epsilon_{it}$$

**Hypothesis 1.A.** A positive relationship exists between the national unemployment rate and the enrollment of male students.

The  $ENR_{M_{it}}$  and  $ENR_{F_{it}}$  represents the total number of male or female students enrolled in institution  $i$  at time  $t$ . The overall model with the predictors remains the same, since the literature review and the human capital investment theory warrants the inclusion of the predictors into the statistical model, however the dependent variables become  $ENR_{M_{it}}$  and  $ENR_{F_{it}}$ . Therefore, to determine whether a positive relationship exists between the national unemployment rate and male enrollments, the following model is proposed:

**Equation 3.1.A:** NUR and female or male enrollments

$$ENR_{M_{it} \text{ or } F_{it}} = \beta_1 NUR + \beta_2 NUR1 + \beta_3 NUR2 + C_{it} + Z_s + W_i + \epsilon_{it}$$

**Hypothesis 1.B.** The national unemployment rate impacts student enrollment for students from different race/ethnicity groups differently.

**Hypothesis 1.B.1.** A positive relationship exists between the national unemployment rate and college enrollments of White students.

**Equation 3.1.B, 3.1.B.1:** The NUR and student enrollment for American Indians, Asians, Blacks, Hispanics, or Whites. The notations for the dependent variables related to undergraduate student enrollment by race/ethnicity groups (American Indian, Asians, Blacks, Hispanics, and Whites) are:  $ENR_{AI_{it}}$ ,  $ENR_{A_{it}}$ ,  $ENR_{B_{it}}$ ,  $ENR_{H_{it}}$  and  $ENR_{W_{it}}$ . Therefore,

$$ENR_{AI_{it}}, ENR_{A_{it}}, ENR_{B_{it}}, ENR_{H_{it}} \text{ and } ENR_{W_{it}} = \beta_1 NUR + \beta_2 NUR1 + \beta_3 NUR2 + C_{it} + Z_s + W_i + \epsilon_{it}$$

**Hypothesis 1.C.** The national unemployment rate impacts negatively student enrollment for students from the second, third, and fourth SES quintiles and positively affects student enrollment for students from the first and fifth SES quintiles.

The dependent variables as related to undergraduate student enrollment by SES quintiles (Q1, Q2, Q3, Q4, and Q5) are  $ENR_{Q1_{it}}$ ,  $ENR_{Q2_{it}}$ ,  $ENR_{Q3_{it}}$ ,  $ENR_{Q4_{it}}$  and  $ENR_{Q5_{it}}$ . Therefore, for students enrolled from each SES quintile (Q1 - lowest, Q2, Q3, Q4, and Q5 -highest), the following models are proposed:

**Equation 3.1.C:** The NUR and enrollment rates for student from SES quintiles (1, 2, 3, 4, or 5)

$$ENR_{Q1_{it}}, ENR_{Q2_{it}}, ENR_{Q3_{it}}, ENR_{Q4_{it}} \text{ or } ENR_{Q5_{it}} = \beta_1 NUR + \beta_2 NUR1 + \beta_3 NUR2 + C_{it} + Z_s + W_i + \epsilon_{it}$$

## Retention Hypotheses

**Hypothesis 2.** A relationship exists between variations in the national unemployment rate and college retention rates.

**Hypothesis 2.A.** The national unemployment rate positively impacts retention rates of full-time students.

**Hypothesis 2.B.** The national unemployment rate negatively impacts retention rates of part-time students.

The DCP retention data are available only for the period starting with 2004 until 2010; therefore, only 3,567 observations are included in the dataset for testing the following models.

*Equation 3.2., 3.2.A., and 3.2.B:* The NUR and full-time or part-time retention rates

$$RET\_FT_{it} \text{ or } RET\_PT_{it} = \beta_1 NUR + \beta_2 NUR1 + \beta_3 NUR2 + C_{it} + Z_s + W_i + \epsilon_{it}$$

## Completions Hypothesis

**Hypothesis 3.** A positive relationship exists between the national unemployment rate and college completions.

The  $COMPL_{it}$  variable represents the total number of completers with a baccalaureate diploma for institution  $i$  at time  $t$ . The number of observations in the dataset for testing the enrollment model is 12,274. Therefore, the following model is proposed:

*Equation 3.3.*: NUR and completions:

$$COMPL_{it} = \beta_1 NUR + \beta_2 NUR1 + \beta_3 NUR2 + C_{it} + Z_s + W_i + \epsilon_{it}$$

Overall, this chapter presented the research design, the study's sample and population, variables, and instrumentation, as well as the data analysis and statistical models for the research question and each hypothesis.

The purpose of this quantitative study is to explore the relationship between the national unemployment rate and indicators of college success (enrollment, retention, and completion), while controlling for student characteristics (gender, race/ethnicity, and socioeconomic status), state unemployment rates, gross domestic product, gross state product, per capital personal income at the national and state levels, state appropriations per IHE, and federal funds, as well as other variables, for all the public 4-year universities in the U.S.

## CHAPTER FOUR

### RESULTS

The purpose of this longitudinal study is to explore the relationship between the national unemployment rate and indicators of college success (enrollment, retention, and completion) for different student characteristics (gender, race/ethnicity, and socioeconomic status), controlling for macroeconomic factors such as gross domestic product, per capital personal income at the national level, state appropriations per IHE, and federal funds, as well as other variables, for all the public 4-year universities in the United States. The main independent variable of interest in this study is the annual national unemployment rate.

This quantitative study uses multiple regression to explore the research hypotheses. The observations for the analysis were organized by institution and year. In this manner, one institution contributed as many as 24 observations for the regression.

The following basic steps were performed for this analysis:

1. Data from datasets such as IPEDS, BLS, BEA, or USDOE were paired with the Delta Cost Project (DCP) dataset by year and institutional identifier.
2. Descriptive statistics were prepared, and preliminary analyses were performed.
3. Models were developed, and regressions were run on them.
4. Data for the dependent variables were transformed using the natural logarithm function to facilitate the interpretation of results.

5. The models were examined for outliers, and they were removed from the models to ensure accuracy.
6. The models were examined for variable collinearity, and variables that were found to have a variable inflation factor (VIF) larger than 2.5 were successively removed from the models starting with the most collinear ones.

While, initially, the intent was to use both institutional and state fixed effects to accurately identify the relationships in the models and account for unobserved changes over time at the institutional as well as the state level, the inclusion of state fixed effects showed collinearity with the institutional fixed effects. Therefore, institutional fixed effects were retained in the models, and the state fixed effects were removed. However, since this study intends take a comprehensive look at both national and state macroeconomic indicators, which may impact student success outcomes, three state level variables were included in the model: the annual state unemployment rate, the annual gross state product, and state per capita personal income variables.

## **Findings**

The following section is divided into three parts. Each part examines the impact of the annual national unemployment rate on undergraduate enrollment, retention, and completion, respectively, for all public 4-year IHEs in the United States. The following section presents descriptive statistics tables for the variables included in the study, figures, statistical model results, and a discussion of the findings.

Table 4.1 presents descriptive statistics for the dependent variables included in the study. Table 4.2 shows descriptive statistics for the independent and control variables included in the statistical models.

## **Enrollment**

The first hypothesis of the study examines whether or not a positive relationship exists between the national unemployment rate and college enrollment patterns. Figure 4.1. shows the average annual college enrollments at all public 4-year IHEs in the US over the period of the study against the annual national unemployment rate. A progressive increase in enrollments can be observed over this period, with average annual enrollments increasing slightly more when the national unemployment rate peaks and decreasing slightly with declines in the annual national unemployment rate.

A multiple regression model was used and the dependent variable – total undergraduate enrollments – was transformed using the natural logarithm function. The goal for transforming the dependent variable was twofold. First, the transformation helped normalize the data. Second, the transformation facilitated the interpretation of results. Table 4.3 illustrates the results of the examination of the relationship between total undergraduate enrollment and the annual national unemployment rate, as well as the control variables that were found to be non-collinear predictors in the model. The results show that a positive relationship exists between these two variables at the 0.01 level ( $p < 0.0001$ ). Specifically, for a one percent increases in the current annual

Table 4.1 Descriptive statistics for the dependent variables

| <b>Dependent Variables</b>     | <b>N</b> | <b>Mean</b> | <b>Median</b> | <b>Mode</b> | <b>Standard Deviation</b> | <b>Range</b> | <b>Minimum</b> | <b>Maximum</b> |
|--------------------------------|----------|-------------|---------------|-------------|---------------------------|--------------|----------------|----------------|
| Log Total Enrollment           | 12,292   | 8.668       | 8.767         | 1.386       | 1.192                     | 11.636       | 0.693          | 12.329         |
| Log Female Enrollment          | 12,238   | 8.023       | 8.206         | 1.946       | 1.161                     | 10.267       | 0.000          | 10.267         |
| Log Male Enrollment            | 12,222   | 7.817       | 7.928         | 0.000       | 1.192                     | 10.232       | 0.000          | 10.232         |
| Log American Indian Enrollment | 11,184   | 3.660       | 3.689         | 1.099       | 1.456                     | 8.623        | 0.000          | 8.623          |
| Log Asian Enrollment           | 11,274   | 4.914       | 4.844         | 1.386       | 1.816                     | 10.489       | 0.000          | 10.489         |
| Log Black Enrollment           | 11,348   | 5.958       | 6.223         | 0.000       | 1.761                     | 11.064       | 0.000          | 11.064         |
| Log Hispanics Enrollment       | 11,415   | 5.073       | 5.030         | 2.833       | 1.816                     | 11.285       | 0.000          | 11.285         |
| Log Whites Enrollment          | 11,407   | 8.340       | 8.620         | 1.099       | 1.517                     | 11.452       | 0.000          | 11.452         |
| Log SES Q1 Enrollment          | 5,385    | 6.599       | 6.672         | 6.335       | 1.057                     | 10.898       | 0.000          | 10.898         |
| Log SES Q2 Enrollment          | 5,390    | 6.292       | 6.372         | 5.951       | 1.067                     | 10.411       | 0.000          | 10.411         |
| Log SES Q3 Enrollment          | 5,381    | 6.200       | 6.321         | 5.631       | 1.069                     | 9.962        | 0.000          | 9.962          |
| Log SES Q4 Enrollment          | 5,388    | 6.521       | 6.678         | 5.670       | 1.091                     | 9.791        | 0.000          | 9.791          |

Table 4.1. – continued

| <b>Dependent Variables</b> | <b>N</b> | <b>Mean</b> | <b>Median</b> | <b>Mode</b> | <b>Standard Deviation</b> | <b>Range</b> | <b>Minimum</b> | <b>Maximum</b> |
|----------------------------|----------|-------------|---------------|-------------|---------------------------|--------------|----------------|----------------|
| Log SES Q5 Enrollment      | 5,361    | 7.478       | 7.627         | 6.267       | 1.216                     | 10.638       | 0.000          | 10.638         |
| FT Retention Rate          | 3,199    | 0.731       | 0.740         | 0.750       | 0.113                     | 0.870        | 0.130          | 1.000          |
| PT Retention Rate          | 3,028    | 0.477       | 0.470         | 0.500       | 0.212                     | 1.000        | 0.000          | 1.000          |
| Log Completions            | 11,921   | 6.854       | 6.946         | 4.990       | 1.182                     | 10.269       | 0.000          | 10.269         |

Table 4.2. Descriptive statistics for independent and control variables

| <b>Independent and Control Variables</b>                           | <b>Count</b> | <b>Mean</b> | <b>Median</b> | <b>Mode</b> | <b>Standard Deviation</b> | <b>Range</b> | <b>Minimum</b> | <b>Maximum</b> |
|--|--------------|-------------|---------------|-------------|---------------------------|--------------|----------------|----------------|
| Annual National Unemployment Rate                                  | 24           | 5.81        | 5.55          | 5.50        | 1.41                      | 5.60         | 4.00           | 9.60           |
| Pell Grants Per IHE (in million \$)                                | 11,935       | 6.26        | 3.79          | 0.19        | 12.37                     | 478.27       | 0.001          | 478.27         |
| Percent of the Population with a Bachelor Degree or Higher         | 24           | 23.19       | 22.05         | 20.30       | 3.09                      | 10.03        | 19.90          | 29.93          |
| Annual Total Number of High School Graduates at the National Level | 24           | 2.56        | 2.49          | 2.30        | 0.28                      | 0.91         | 2.22           | 3.13           |
| State Appropriations per IHE (in million \$)                       | 11,981       | 73.99       | 34.32         | 6.19        | 114.44                    | 1,939.63     | 0.00           | 1,939.63       |
| In-state Tuition and Fees  | 12,046       | 3,321.30    | 2,859         | 0           | 2,060                     | 22,997       | 0              | 22,997         |
| Out-of-State Tuition and Fees                                      | 12,055       | 8,402.08    | 7,662         | 0           | 4,803                     | 34,937       | 0              | 34,937         |
| Annual State Unemployment Rate                                     | 12,768       | 5.64        | 5.30          | 5.40        | 1.85                      | 16.70        | 2.20           | 18.90          |
| Annual Gross State Product (in million \$)                         | 12,641       | 0.36        | 0.22          | 0.56        | 0.39                      | 1.98         | 0.01           | 1.99           |
| Annual Per Capita Personal Income at State Level                   | 12,641       | 27,642.35   | 26,546        | 30,639      | 8,796                     | 59,253       | 10,891         | 70,144         |

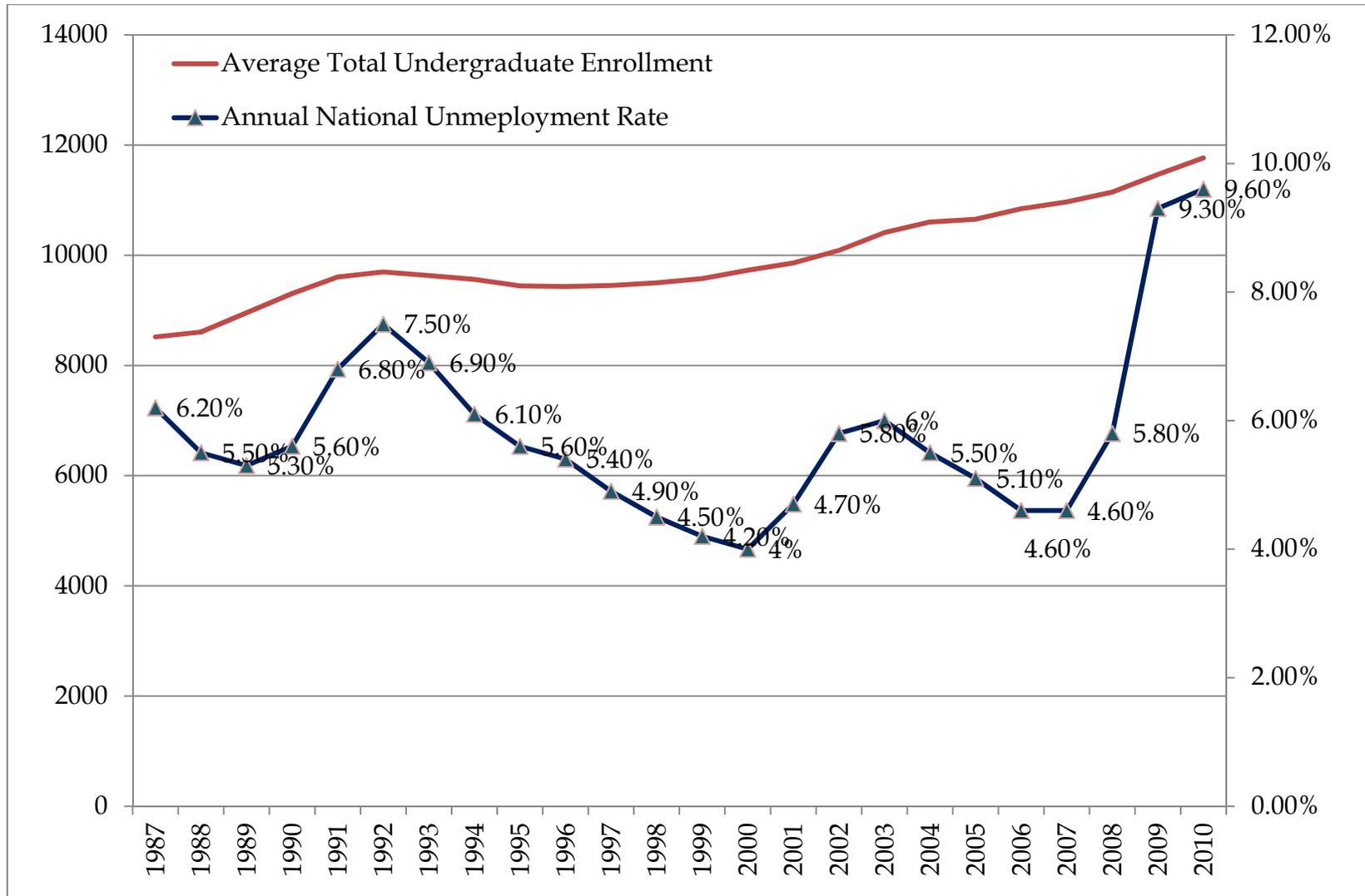


Figure 4.1. Average of total undergraduate enrollment numbers by year versus annual national unemployment rate; Outliers were removed from the dataset which served as the source for this plot.

NUR, total undergraduate enrollment increased by 1.3 percent, all else being equal. The  $R^2$  for this model is 0.986, meaning that 98.6 percent of the variation in the dependent variable (total undergraduate enrollments) can be explained by the variables in the model (N=11,443).

Therefore, the current annual national unemployment rate was found to positively impact total undergraduate enrollments at 4-year public IHEs. This finding provides support for hypothesis 1.

**Enrollment by gender.** The following section discusses the results of an examination of the relationship between the national unemployment rate (NUR) and undergraduate enrollment by gender. Hypotheses 1.A. suggests that a positive relationship exists between male undergraduate enrollments and NUR, and the results included in table 4.3. provide support for this hypothesis. Specifically, for every one percent increase in the NUR, the percentage of males enrolling in public 4-year IHEs was found to increase by 1.9 percent. The  $R^2$  for the model is 0.986, and the NUR is significant at the 0.01 level,  $p < 0.0001$  (N=11,415).

It is interesting to note that both males and females were found to respond positively to variations in the NUR, however the magnitude of the relationship was is smaller for females than for males. The NUR was found to have a statistically significant effect, at the 0.01 level, in both models. Specifically, a one percent increase in the NUR was found to lead to a 1.2 percent increase in female enrollment at public 4-year IHEs ( $p < 0.0001$ , N=11,420,  $R^2=0.983$ ), all else being equal.

Figure 4.2. shows average annual enrollments by gender. The gap in enrollments between males and females is obvious, and, over the period of the study, it has become wider. Therefore, while male enrollments were found to increase in public 4-year IHEs during recessions in larger proportions than women's, the gap is still pronounced. Additionally, as shown in figure 4.2., years of increased unemployment rates or economic contraction tend to be fewer than years of decreases in unemployment rates or economic expansion. All in all, the study shows that while both genders are positively impacted by the NUR -- and even though male enrollments were found to increase about 59% more than those for female during periods of increases in the NUR -- females still lead in college enrollments, and the gap has been getting wider over the past 24 years.

**Enrollment by race/ethnicity.** Hypothesis 1.B. suggests that variations in the NUR impact differently the undergraduate enrollment patterns of students of different race/ethnicities at 4-year public IHEs.

According to table 4.4., the current NUR plays a statistically significant role in the enrollment patterns of students from different race/ethnicities; however, the direction and magnitude of the relationship differs by race/ethnicity. Specifically, the current NUR positively impacts the enrollment patterns of Blacks and Whites. For Blacks, a one percent increase in the current annual NUR leads to a one percent increase in enrollments at public 4-year IHEs ( $p < 0.0001$ ,  $N = 10,535$ ,  $R^2 = 0.977$ ), while, for Whites, a

one percent increase leads to a 1.4 percent increase ( $p < 0.0001$ ,  $N = 10,463$ ,  $R^2 = 0.988$ ), all else being equal. This latter finding provides support for hypothesis 1.B.1.

For American Indian, Asian, and Hispanic students, the current NUR was found to negatively impact enrollment patterns, but the relationship was not statistically significant. For these students, however, a lagged effect was observed; namely, increases in the annual national unemployment rate at time  $t-2$  (NUR2) significantly led to decreases in enrollment at time  $t$ . In other words, a one percent increase in unemployment rate two years ago led to 3.5, 3, and 4.7 percent decreases in enrollment ( $p < 0.0001$ ) in the current year for American Indians, Asians, and Hispanics, respectively, all else being equal. Therefore, results show that variations in the NUR impact students from different race/ethnicities differently; hence, hypothesis 1.B is supported.

Figure 4.3. illustrates the average annual enrollment by race/ethnicity in public 4-year IHEs. The gap in undergraduate enrollments is visible, with Whites leading in terms of undergraduate enrollment, followed by Blacks, Hispanics, and Asians, according to the DCP dataset. Also, it is worth noting that according to the DCP, college enrollments increased for all race/ethnicity categories except for American Indians.

Table 4.3. Total enrollment and enrollment by gender regressions

|   | Total<br>Enrollment<br>(N=11,443) | Female<br>Enrollment<br>(N=11,420) | Male<br>Enrollment<br>(N=11,415) |
|---|-----------------------------------|------------------------------------|----------------------------------|
| Variables   | B<br>(SE)                         | B<br>(SE)                          | B<br>(SE)                        |
| Constant  | 6.531***<br>(0.126)               | 5.796***<br>(0.134)                | 5.537***<br>(0.132)              |
| NUR (Annual National Unemployment Rate at time t)       | 0.013***<br>(0.001)               | 0.012***<br>(0.001)                | 0.019***<br>(0.001)              |
| NUR2 (Annual National Unemployment Rate at time t-2)    | -0.001<br>(0.002)                 | -0.014***<br>(0.002)               | -0.001<br>(0.002)                |
| SUR1 (state unemployment rate at time t-1)              | -0.003**<br>(0.001)               | -0.002<br>(0.001)                  | 0.004***<br>(0.001)              |
| Gross state product (SGDP) at time t<br>(in million \$) | 0.162***<br>(0.01)                | 0.226***<br>(0.01)                 | 0.133***<br>(0.01)               |
| In State Tuition & Fees<br>(in thousand \$)             | 0.009***<br>(0.001)               | 0.003*<br>(0.001)                  | 0.001<br>(0.001)                 |

Table 4.3. – continued

|  | Total Enrollment<br>(N=11,443) | Female Enr<br>(N=11,420) | Male Enr<br>(N=11,415) |
|--|--------------------------------|--------------------------|------------------------|
| State Appropriations<br>(in million \$)  | 0<br>(0)                       | 0<br>(0)                 | 0<br>(0)               |
| Pell Grant Amount by Institution<br>(in million \$)                                      | 0.003***<br>(0)                | 0.001***<br>(0)          | 0<br>(0)               |
| Number of High School Graduates from Public High Schools at<br>time t-1<br>(in millions) | 0.074***<br>(0.01)             | 0.135***<br>(0.01)       | 0.117***<br>(0.01)     |
| R <sup>2</sup>   | 0.986                          | 0.983                    | 0.986                  |

\*p<0.10, \*\*p<0.05, \*\*\*p<0.01. The dependent variables were transformed using the natural logarithm function.

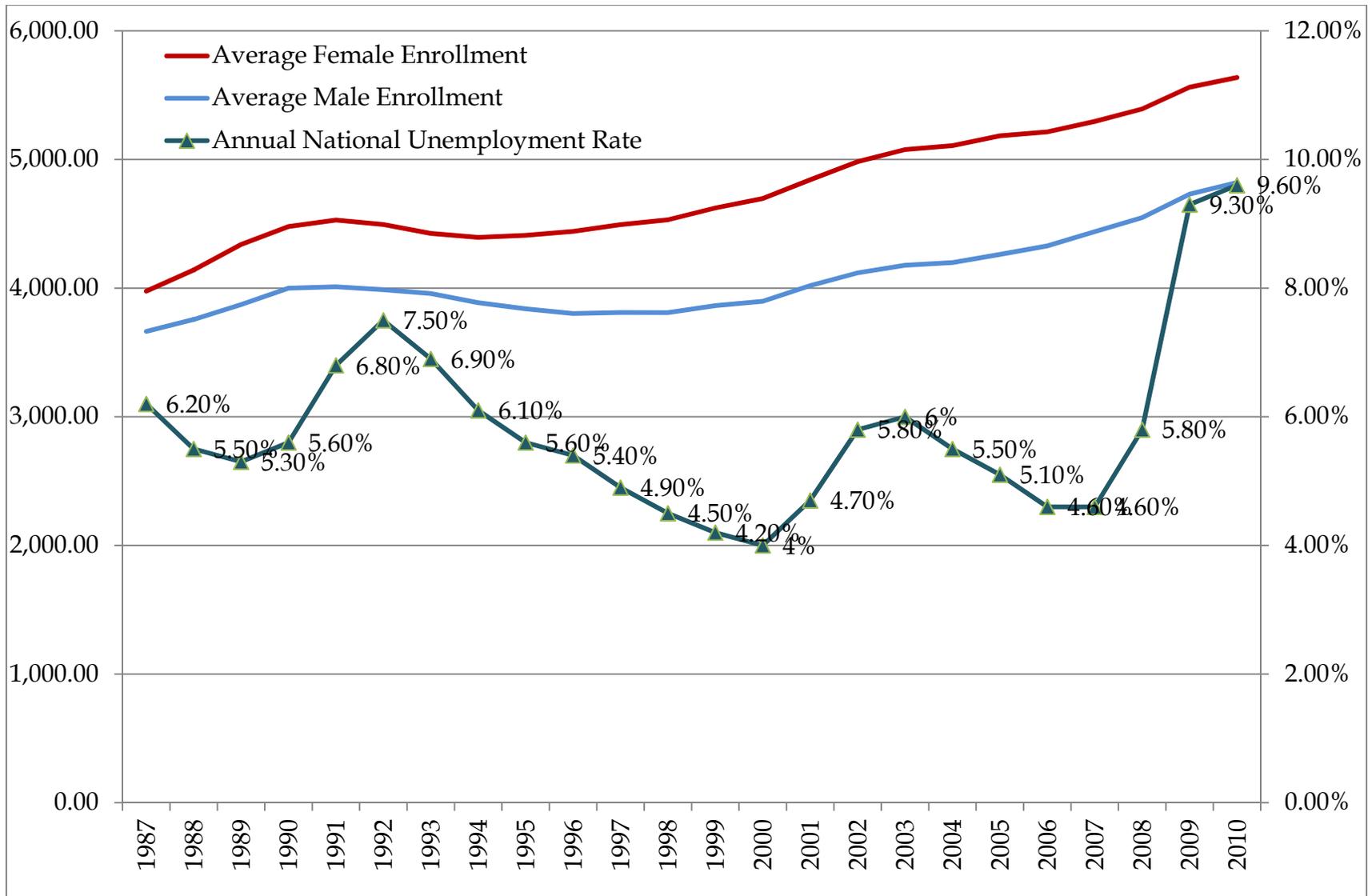


Figure 4.2. Average annual enrollments by gender versus the annual national unemployment rate; Outliers were removed from the datasets which served as data sources for this plot.

**Enrollment by socio-economic status.** Hypothesis 1.C. suggests that the NUR impacts negatively student enrollment for students from the second, third, and fourth socio-economic (SES) quintiles and positively for students from the first and fifth SES quintiles. Results included in table 4.5 provide partial support for this hypothesis. First, the current NUR was found to negatively impact the enrollment patterns of students from the first and second lowest SES quintiles. Students from the two lowest SES quintiles, Q1 and Q2, decreased enrollment in public 4-year IHEs by 5 and 5.4 percent, respectively, when the current NUR increased by one percent, all else being equal ( $p < 0.0001$  for both Q1 and Q2). It is worth noting that the decrease in enrollment for students from Q2 is higher (5.4 percent) than the Q1 (5 percent). Therefore, students from Q2 were found to be more sensitive to variations in the unemployment rate than the ones from Q1.

Students from the third quintile Q3 were found to exhibit a negative relationship with the current NUR; however, the relationship did not rise to the level of statistical significance ( $p = 0.6187$ ). For Q3 students, the NUR at time  $t-2$  was found to play a statistically significant role, and increases in the national unemployment rate were found to prompt increases of 3.2 percent in public 4-year IHEs ( $p < 0.0001$ ). In other words, students from Q3 were found to exhibit a lagged effect in enrollment, being more sensitive to variations in the NUR from two years prior.

Table 4.4. Enrollment by race/ethnicity regressions

|  | American<br>Indian Enr<br>(N=10,444) | Asian Enr<br>(N=10,478) | Black Enr<br>(N=10,535) | Hispanic Enr<br>(N=10,516) | White Enr<br>(N=10,463) |
|--|--------------------------------------|-------------------------|-------------------------|----------------------------|-------------------------|
| Variables  | B<br>(SE)                            | B<br>(SE)               | B<br>(SE)               | B<br>(SE)                  | B<br>(SE)               |
| Constant   | 3.100***<br>(0.379)                  | 3.140***<br>(0.331)     | 3.763***<br>(0.259)     | 3.654***<br>(0.334)        | 6.725***<br>(0.142)     |
| NUR (Annual National Unemployment Rate at time t)      | -0.002<br>(0.003)                    | -0.003<br>(0.003)       | 0.010***<br>(0.002)     | -0.001<br>(0.003)          | 0.014***<br>(0.001)     |
| NUR2 (Annual National Unemployment Rate at time t-2)   | -0.035***<br>(0.005)                 | -0.030***<br>(0.005)    | -0.004<br>(0.004)       | -0.047***<br>(0.005)       | 0.010***<br>(0.002)     |
| SUR1 (state unemployment rate at time t-1)             | -0.036***<br>(0.004)                 | -0.020***<br>(0.003)    | -0.022***<br>(0.003)    | -0.015***<br>(0.003)       | -0.002<br>(0.001)       |
| Gross state product (GSP) at time t<br>(in million \$) | -0.124***<br>(0.030)                 | 0.240***<br>(0.03)      | -0.030<br>(0.020)       | 0.135***<br>(0.030)        | -0.139***<br>(0.010)    |
| In State Tuition & Fees<br>(in thousand \$)            | 0.114***<br>(0.004)                  | 0.123***<br>(0.004)     | 0.055***<br>(0.003)     | 0.141***<br>(0.004)        | -0.002<br>(0.002)       |

Table 4.4. - continued

|  | American<br>Indian Enr<br>(N=10,444) | Asian Enr<br>(N=10,478) | Black Enr<br>(N=10,535) | Hispanic Enr<br>(N=10,516) | White Enr<br>(N=10,463) |
|--|--------------------------------------|-------------------------|-------------------------|----------------------------|-------------------------|
| State Appropriations<br>(in million \$)  | 0<br>(0)                             | 0.001***<br>(0)         | 0***<br>(0)             | 0**<br>(0)                 | 0***<br>(0)             |
| Pell Grant Amount by Institution<br>(in million \$)                                      | 0.001<br>(0.000)                     | 0.001<br>(0)            | 0.003***<br>(0)         | 0.003***<br>(0)            | 0<br>(0)                |
| Number of High School Graduates from Public<br>High Schools at time t-1<br>(in millions) | -0.034<br>(0.030)                    | 0.035<br>(0.02)         | 0.370***<br>(0.02)      | 0.372***<br>(0.030)        | 0.028***<br>(0.010)     |
| R <sup>2</sup>   | 0.934                                | 0.969                   | 0.977                   | 0.966                      | 0.988                   |

\*p<0.10, \*\*p<0.05, \*\*\*p<0.01; The dependent variables were transformed using the natural logarithm function.

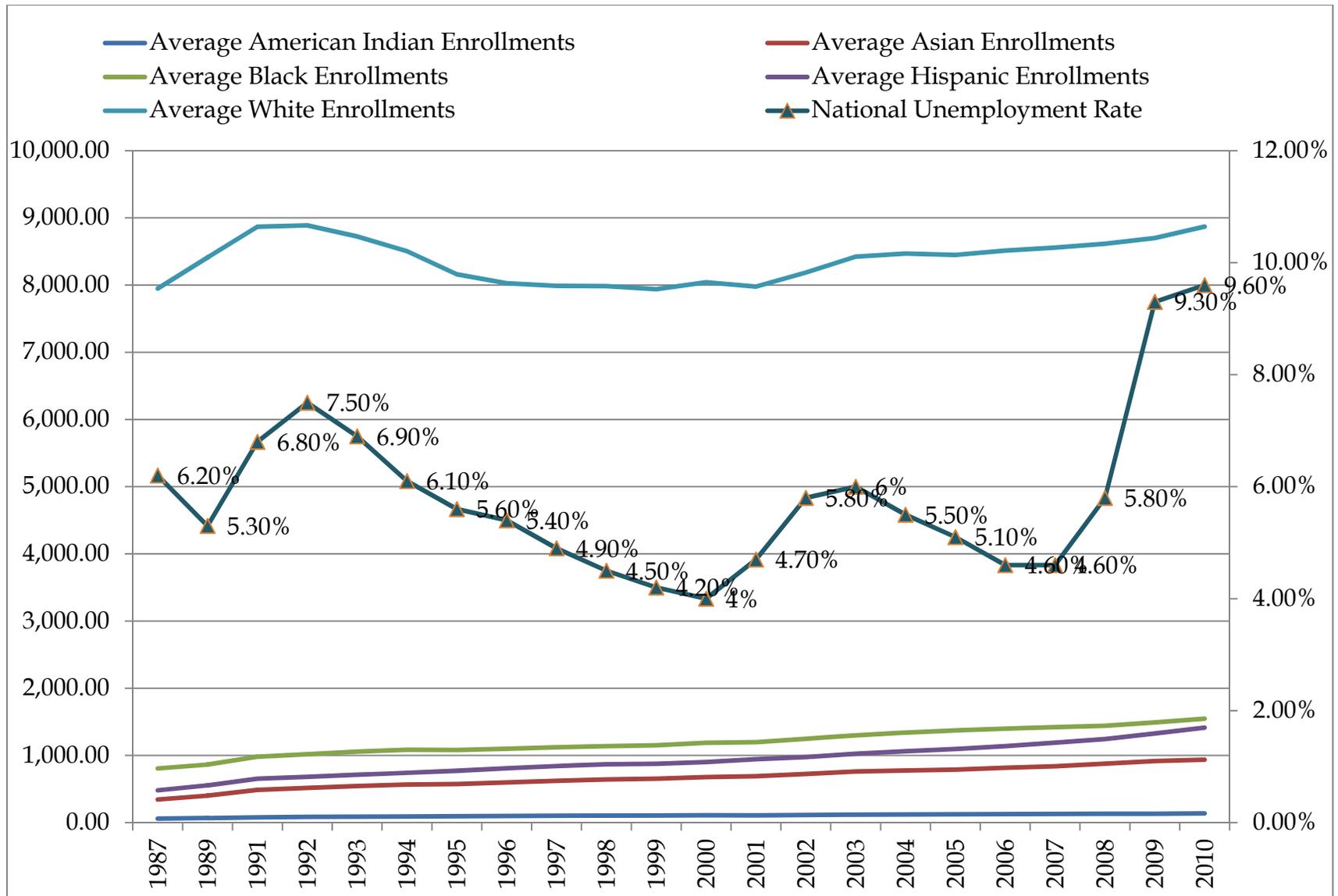


Figure 4.3. Average annual enrollment by race/ethnicity and the annual national unemployment rate; Outliers were removed from the datasets that served as data sources for this plot; Data were not available for years 1988 and 1990.

For students from the upper SES quintiles, Q4 and Q5, variations in the current NUR were found to positively impact enrollments. Specifically, students from Q4 were found to increase enrollments in public 4-year IHEs by 1.1 percent when the current NUR (NUR at time  $t$ ) increased by one percent ( $p=0.0128$ ), all else being equal. The effect was even more pronounced for students from Q5, which were found to enroll in public IHEs in even higher numbers when the current NUR increased. Namely, for every one percent increase in the NUR, the percent of students enrolling in public 4-year IHEs increased by 8.1 percent ( $p<0.0001$ ,  $R^2=.978$ ), all else being equal.

Therefore, students from the lower (Q1 and Q2) and upper (Q4 and Q5) quintiles were found to respond quickly to variations in the NUR by decreasing or increasing their enrollments in public 4-year IHEs. At the same time, students from Q3 were found to exhibit a delayed response to variations in the NUR when enrolling in public 4-year IHEs. All in all, these findings provide mixed support for hypothesis 1.C.

Figure 4.4. illustrates average annual enrollments by socio-economic status, and the gap in enrollments is easily visible. It is interesting to note that over the period of the study for which DCP provided data (1998-2008), students from the highest and lowest SES quintiles, Q5 and Q1, respectively, increased enrollments in public 4-year IHEs, while students from the middle quintiles, Q2-4, actually decreased overall enrollments.

Table 4.5. Enrollment by socio-economic status regressions

|   | SES Q1<br>(Lowest)<br>(N=5,211) | SES Q2<br>(N=5,216)  | SES Q3<br>(N=5,209)  | SES Q4<br>(N=5,215) | SES Q5<br>(Highest)<br>(N=5,191) |
|---|---------------------------------|----------------------|----------------------|---------------------|----------------------------------|
| Variables   | B<br>(SE)                       | B<br>(SE)            | B<br>(SE)            | B<br>(SE)           | B<br>(SE)                        |
| Constant  | 5.926***<br>(0.187)             | 5.476***<br>(0.143)  | 3.803***<br>(0.131)  | 4.224***<br>(0.126) | 3.096***<br>(0.153)              |
| NUR (Annual National Unemployment Rate<br>at time t)                      | -0.050***<br>(0.006)            | -0.054***<br>(0.004) | -0.002<br>(0.004)    | 0.011**<br>(0.004)  | 0.081***<br>(0.005)              |
| NUR2 (Annual National Unemployment Rate<br>at time t-2)                   | 0.034***<br>(0.006)             | 0.011**<br>(0.005)   | 0.032***<br>(0.004)  | 0.014***<br>(0.004) | 0.026***<br>(0.005)              |
| SUR1 (state unemployment rate at time t-1)                                | 0.001<br>(0.005)                | 0.037***<br>(0.004)  | 0.019***<br>(0.003)  | 0.014***<br>(0.004) | 0.026***<br>(0.004)              |
| Gross state product (SGDP) at time t<br>(in million \$)                   | 0.584***<br>(0.070)             | 0.334***<br>(0.050)  | 0.709***<br>(0.050)  | 0.706***<br>(0.040) | 0.891***<br>(0.050)              |
| State Per Capita Personal Income (SPCPI) at<br>time t<br>(in thousand \$) | 0.016***<br>(0.001)             |                      | -0.008***<br>(0.001) |                     |                                  |

Table 4.5. – continued

|   | SES Q1<br>(Lowest)<br>(N=5,211) | SES Q2<br>(N=5,216)  | SES Q3<br>(N=5,209)  | SES Q4<br>(N=5,215)  | SES Q5<br>(Highest)<br>(N=5,191) |
|---|---------------------------------|----------------------|----------------------|----------------------|----------------------------------|
| In-State Tuition & Fees<br>(in thousand \$)                           | 0.010**<br>(0.005)              | -0.041***<br>(0.004) | -0.030***<br>(0.003) | -0.029***<br>(0.003) | 0.040***<br>(0.004)              |
| State Appropriations<br>(in million \$)                               | -0.001***<br>(0)                | -0.001***<br>(0)     | 0**<br>(0)           | 0*<br>(0)            | 0<br>(0)                         |
| Percent of Population with a Bachelor Degree<br>or higher at time t   |                                 | -0.042***<br>(0.002) |                      |                      | 0.038***<br>(0.002)              |
| Percent of Population with a Bachelor Degree<br>or Higher at time t-1 |                                 |                      |                      | -0.015***<br>(0.002) |                                  |
| Pell Grant Amount by Institution                                      | 0.012***<br>(0)                 | 0.013***<br>(0)      | 0.013***<br>(0)      | 0.011***<br>(0)      | 0.010***<br>(0)                  |
| R <sup>2</sup>  | 0.964                           | 0.979                | 0.982                | 0.983                | 0.978                            |

\*p<0.10, \*\*p<0.05, \*\*\*p<0.01; The dependent variables were transformed using the natural logarithm function.

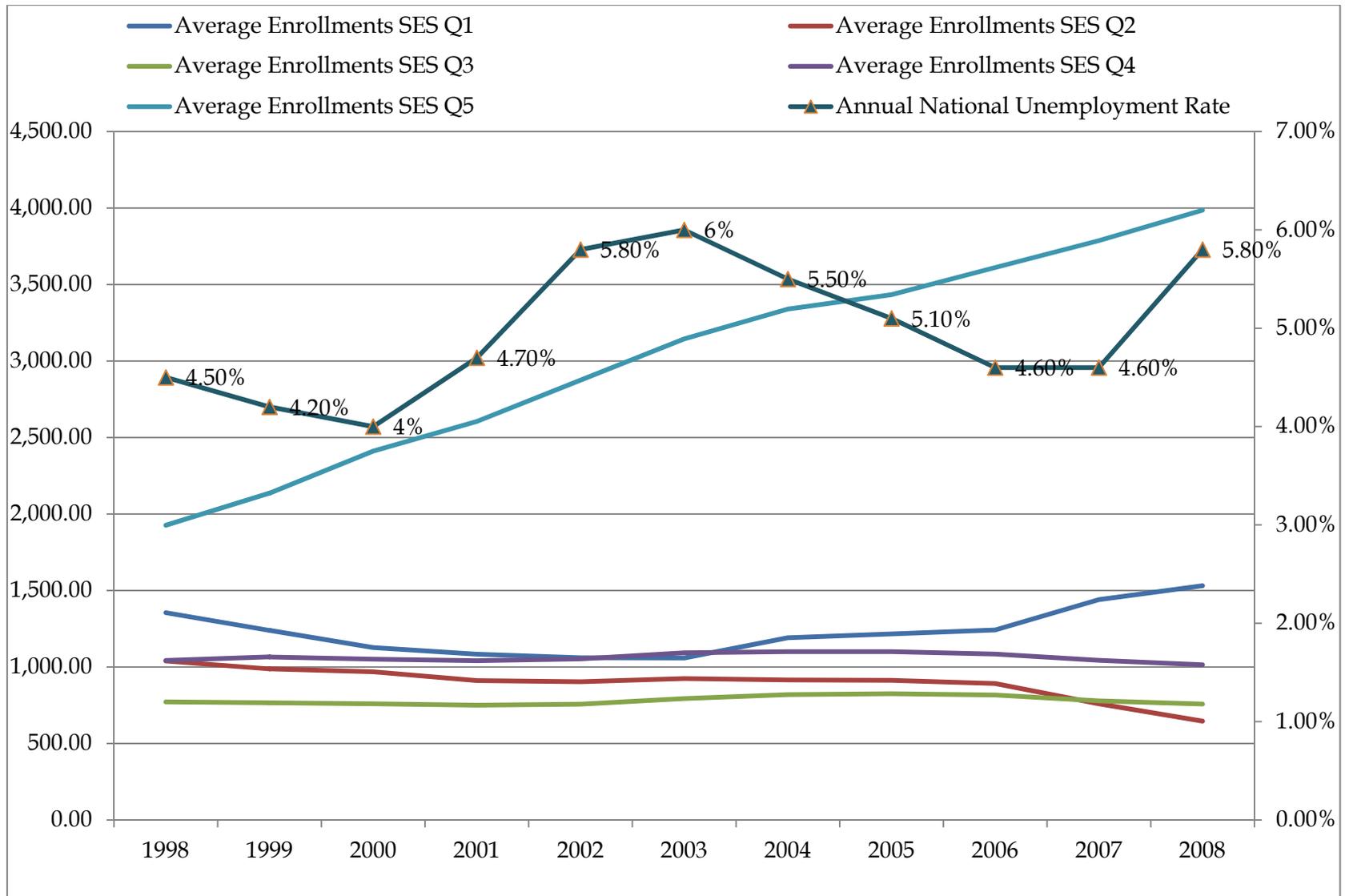


Figure 4.4. Average annual enrollment by socio-economic status versus the annual national unemployment rate; Outliers were removed from the datasets that served as data sources for this plot; DCP provided data only for the period between 1998-2008.

## Retention

Hypothesis 2 suggests that a relationship exists between variations in the NUR and college retention rates. Hypothesis 2.A. predicts that the NUR impacts positively the retention rates of full-time students. The results show that the retention rate of full-time students at public 4-year IHEs has a positive relationship with the national unemployment rate. Specifically, a positive connection was found between the retention rate of full-time students and the unemployment rate at time  $t-2$ ; i.e., the national unemployment rate from two years prior (NUR2) ( $p=0.0021<0.01$ ). In other words, students who enrolled full-time during their freshmen year were more likely to re-enroll or continue their studies, whether part- or full-time, when they witnessed increases in the unemployment rate two years prior to re-enrollment. A one percent increase in the national unemployment rate at time  $t-2$  was found to lead to a 0.4 percent increase in the full-time retention rate at public 4-year IHEs, *ceteris paribus* ( $p<0.01$ ). Other variables that play a statically significant role in influencing full-time retention rates were federal appropriations per institution - the amount of Pell grant received by institution -- and the percent of the population with a bachelor's degree or higher at time  $t$ . The  $R^2$  for the full-time retention rate model was 0.920. Therefore, hypothesis 2.A is supported.

Hypothesis 2.B suggests that the NUR negatively impacts the retention rates of part-time students. The retention rate of students attending part-time students was found to not be sensitive to variations in the national unemployment rate. Moreover, none of the variables included in the model were found to play a statistically significant

role in explaining the retention rate of part-time students ( $N=2,983$ ,  $R^2=0.474$ ).

Therefore, since no relationship was found between the national unemployment rate and part-time retention rates, hypothesis 2.B is not supported.

Therefore, mixed support was found for hypothesis 2 of the study. A relationship was found to exist between the national unemployment rate and the college retention rate; however, this relationship was found only for full-time retention rates.

### **Completions**

Hypothesis 3 suggests that a positive relationship exists between college completions and the national unemployment rate. Figure 4.6. shows that over the period of the study, average annual completions of bachelor degrees at public 4-year IHEs increased. Additionally, results in table 4.7. provide support for this hypothesis. Specifically, for every one percent increase in the current annual NUR, completions at public 4-year IHEs increase by 0.7 percent ( $p<0.0001$ ). Therefore, completions appear to adjust quickly to variations in unemployment, albeit the adjustment is small. Other variables that were found to play a statistically significant role in college completions were gross domestic product, in-state tuition and fees, state appropriations, and federal appropriations through the Pell grant amount ( $N=11,285$ ,  $R^2=.978$ ).

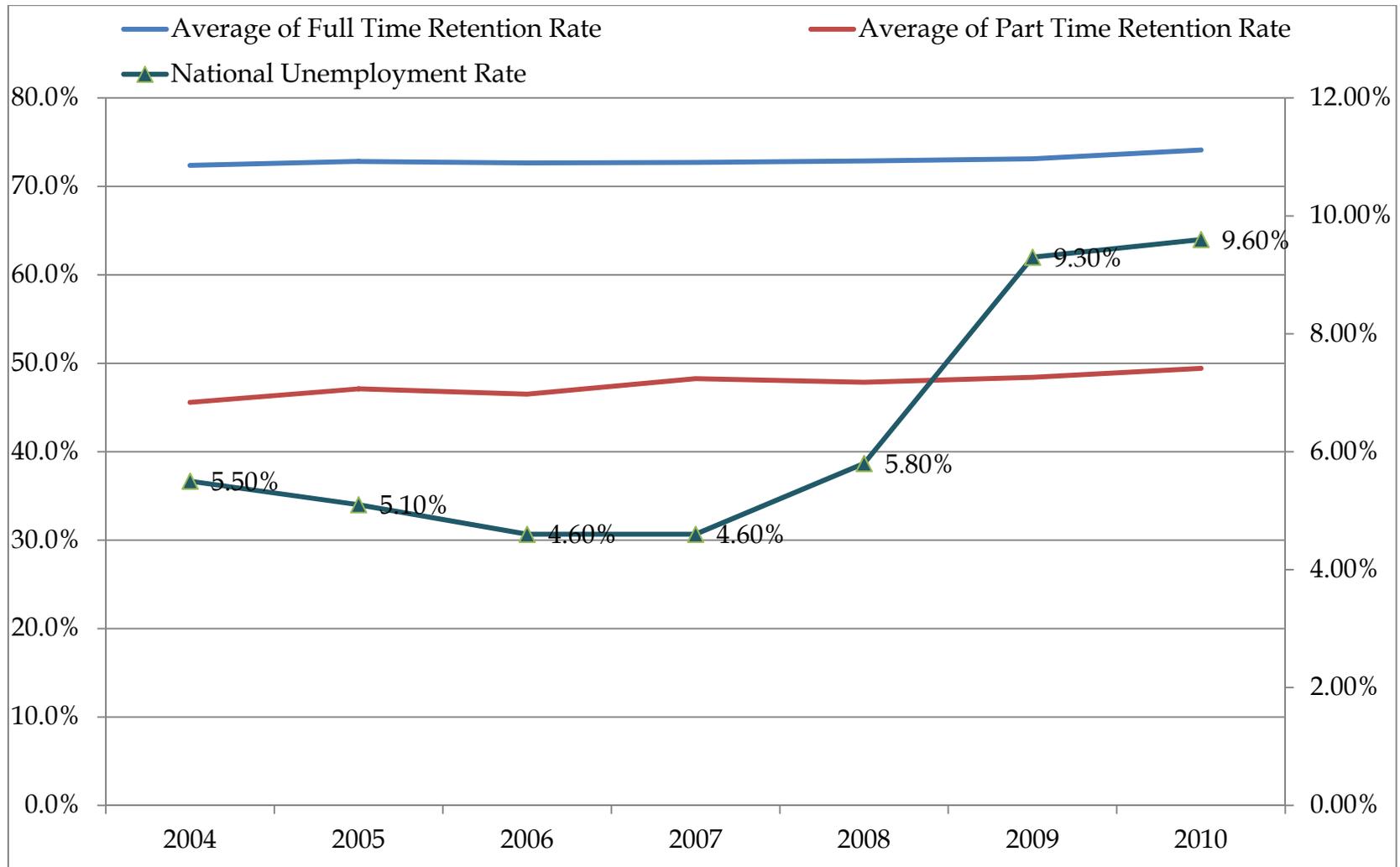


Figure 4.5. Average of full- and part-time retention rates by year versus the annual national unemployment rate; Outliers were removed from the datasets that served as data sources for this plot; THE DCP provided data only for the period between 2004-2010.

Table 4.6. Full- and part-time retention rate regressions

| Variables  | Full-Time Retention<br>Rate<br>(N=3,130) | Part-Time Retention<br>Rate<br>(N=2,983) |
|--|--|--|
|  | B<br>(SE)                                | B<br>(SE)                                |
| Constant   | -0.075*<br>(0.040)                       | -0.167<br>(0.194)                        |
| NUR (Annual National Unemployment Rate at time t)                      |  | 0.002<br>(0.002)                         |
| NUR2 (Annual National Unemployment Rate at time t-2)                   | 0.005***<br>(0.002)                      | 0.006<br>(0.008)                         |
| Gross state product (SGDP) at time t<br>(in million \$)                | 0.027<br>(0.040)                         | 0.190<br>(0.190)                         |
| State Per Capita Personal Income (SPCPI) at time t<br>(in thousand \$) | 0<br>(0)                                 | 0.001<br>(0.002)                         |
| Out-of-State Tuition & Fees<br>(in thousand \$)                        | 0<br>(0)                                 | 0.002<br>(0.002)                         |

Table 4.6. - continued

|   | Full-Time Retention<br>Rate<br>(N=3,130) | Part-Time Retention<br>Rate<br>(N=2,983) |
|---|--|--|
| Percent of Population with a Bachelor Degree or higher at<br>time t | 0.001***<br>(0)                          |  |
| Pell Grant Amount by Institution<br>(in million \$)                 | 0***<br>(0)                              | 0.001<br>(0)                             |
| R <sup>2</sup>  | 0.920                                    | 0.474                                    |

\*p<0.10, \*\*p<0.05, \*\*\*p<0.01; The dependent variables were not transformed.

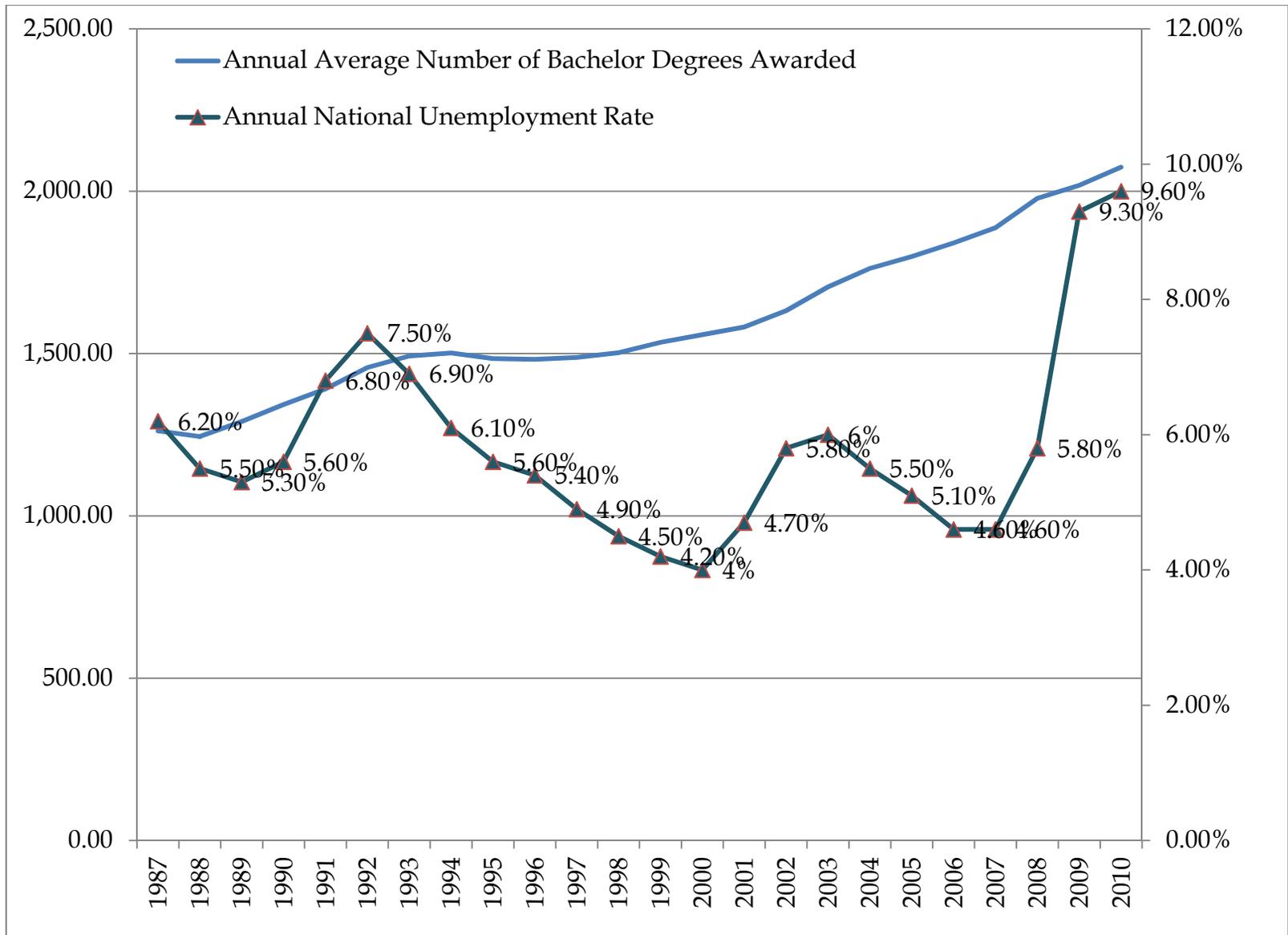


Figure 4.6. Average annual number of bachelor degrees awarded versus the annual national unemployment rate; Outliers were removed from the dataset that served as the data source for this plot.

Table 4.7. Completions regression

| Variables   | Completions<br>(N=11,285) |
|---|---------------------------|
|   | B<br>(SE)                 |
| Constant  | 5.175***<br>(0.163)       |
| NUR (Annual National Unemployment Rate at time t)       | 0.007***<br>(0.001)       |
| NUR2 (Annual National Unemployment Rate at time t-2)    | -0.0041*<br>(0.002)       |
| SUR1 (state unemployment rate at time t-1)              | -0.0003<br>(0.002)        |
| Gross state product (SGDP) at time t<br>(in million \$) | 0.276***<br>(0.01)        |
| In-State Tuition & Fees<br>(in thousand \$)             | 0.043***<br>(0.001)       |
| State Appropriations<br>(in million \$)                 | 0***<br>(0)               |
| Pell Grant Amount by Institution<br>(in million \$)     | 0.002***<br>(0)           |
| R <sup>2</sup>  | 0.978                     |

\*p<0.10, \*\*p<0.05, \*\*\*p<0.01; The dependent variable was transformed using the natural logarithm function.

## Summary

This study found a statistically significant relationship between the current national unemployment rate and enrollments in public 4-year IHEs. Also, both men and women were found to increase college enrollments when the current annual NUR increased. Students of different race/ethnicities were found to respond differently to variations in the NUR. Blacks and Whites were found to increase enrollments in college when the current NUR increased, while American Indians, Asians, and Hispanics were found to exhibit a lag in college enrollment, being more likely to decrease enrollments when the annual national unemployment rate increased two years prior, all else being equal. The current NUR did not seem to influence college enrollments in a statistically significant way for American Indians, Asians, or Hispanics at any level of statistical significance. Finally, in terms of SES and enrollments, students from the lower quintiles (Q1 and Q2) were found to decrease enrollment in college when the current annual NUR increased, while students from the upper quintiles (Q4 and Q5) were found to increase enrollment when the current NUR increased. Students from the middle quintile - Q3 - were found to be insensitive to variations in the current NUR; however, they were found to exhibit a lagged response to the NUR. Specifically, these students were found to increase enrollment in college when the annual NUR from two years prior (or at time  $t-2$ ) increased.

College retention rates were found to be sensitive to variations in NUR. Specifically, full-time retention rates were found to increase when the annual NUR from two years prior (at time  $t-2$ ) increased; therefore, exhibiting a lagged response to

variations in the NUR. However, the part-time retention rate was found to be insensitive to variations in the NUR.

Finally, completions were found to be responsive to variations in the unemployment rate. Specifically, a positive relationship was found between college completions at public 4-year IHEs and the current annual NUR. Tables 4.8 and 4.9 provide a summary of the relationships that were found between the dependent and independent variables of the study. A “+” or “-” identifies a statistically significant positive or negative relationship between the dependent and independent variables. A missing value (no “+” or “-”) indicates that no statistically significant relationship was found between these variables.

All in all, the study found support for the hypothesis that variations in the annual national unemployment rate impact college enrollment and success outcomes at public 4-year IHEs.

Table 4.8. Summary table - enrollment

| Independent Variables                         | Total Enrollment | Female | Male | American Indian | Asian | Black | Hispanic | White | SES Q1 (lowest) | SES Q2 | SES Q3 | SES Q4 | SES Q5 (highest) |
|---|------------------|--------|------|-----------------|-------|-------|----------|-------|-----------------|--------|--------|--------|------------------|
| National Unemployment Rate at time t (NUR)    | +                | +      | +    |                 |       | +     |          | +     | -               | -      |        | +      | +                |
| National Unemployment Rate at time t-2 (NUR2) |                  | -      |      | -               | -     |       | -        | +     | +               | +      | +      | +      | +                |

Table 4.9. Summary table - retention rate and completions

| Independent Variables                         | Full-time | Part-Time | Completions |
|---|-----------|-----------|-------------|
| National Unemployment Rate at time t (NUR)    |           |           | +           |
| National Unemployment Rate at time t-2 (NUR2) | +         |           | -           |

A "+" or "-" identifies a statically significant positive or negative relationship between the dependent and independent variables. A missing value (no "+" or "-") indicates that no statically significant relationship was found between the variables; The national unemployment rate at time *t-1* (NUR1) was found to be collinear with the NUR, and, therefore, it is not included in the table.

## CHAPTER FIVE

### DISCUSSION, IMPLICATIONS, AND CONCLUSIONS

The main focus of this study was to evaluate the impact of the national unemployment rate on college enrollment and success outcomes (retention and completion) at 4-year public IHEs in the United States. While scholars have previously focused on exploring what factors may impact these outcomes, as well as how state or local unemployment rates may impact these outcomes (Cameron & Hackman, 2001; Black & Sufi, 2002; Dellas & Sakellaris, 2003; Perna & Titus, 2004; Turner, 2004; Stratton, et al., 2007; Goyette 2008), assessing the impact of the national unemployment rate on these outcomes has received very little attention in the literature (Betts & McFarland, 1995; Dellas & Sakellaris, 2003; Boffy-Ramirez, et al., 2010). Betts and McFarland (1995) found a positive relationship between the national unemployment rate and community college enrollments, however that same relationship was never examined in regards to public 4-year IHEs. The results of this study show that a relationship exists between variations in the national unemployment rate and college enrollment and success outcomes at public 4-year IHEs.

The sample of the study includes all public 4-year IHEs in the United States, about 500 institutions, over a period of 24 years, for a total number of more than 12,000 observations. However, the sample size varies with the dependent variable analyzed. The study is significant for the following reasons. First, it provides empirical evidence of how cycles of economic expansion and contraction, as measured by the national unemployment rate, impact public 4-year IHEs. The study focused on public 4-year

IHEs since they enroll the vast majority of students (NCES), and this relationship has not been explored before in the literature. Second, the study benefits scholars, policy makers, and higher education administrators (more details are included in the implications section later in this chapter). Finally, the study uses human capital investment theory as its theoretical framework and finds that students with certain characteristics (gender, race, socio-economic status, part- or full-time attendance) are more likely to enroll, continue, or complete their undergraduate education.

The human capital investment theory serves as the theoretical framework for this study. The theory posits that investments in human capital development (in this case, education) are more likely to occur during periods of increased unemployment rates since the opportunity costs (foregone earnings) tend to be lower during these times. In other words, according to the human capital investment theory, individuals are more likely to invest in capital development during periods of higher unemployment rates (Betts & McFarland, 1995; Dellas & Koubi, 2003; Dellas & Sakellaris, 2003; Perna, 2005; Arkes, 2010). The study's findings provide support for the theory; however, this support is contingent on the different characteristics (gender, race, socio-economic status, part- or full-time attendance) of the students involved.

This chapter presents the study's hypotheses and discusses their significance and implications. Recommendations in regards to how the study may benefit higher education research, policy makers, and administrators, as well as recommendations for future research, are also provided.

## Discussion

This study found that a relationship exists between the national unemployment rate and college enrollment and success outcomes at 4-year public IHEs. The discussion section is separated into three areas – enrollment, retention, and completions.

### Enrollment

Scholarly literature guided the development of the first hypothesis of the study that enrollments at public 4-year IHEs are impacted by the national unemployment rate. The relationship between the unemployment rate – national, state, and/or local – and institutions of higher education has received some attention in the literature. Previous studies have found that the national unemployment rate has a positive relationship with enrollments at community colleges (Betts & McFarland, 1995), state unemployment rates have an impact on college enrollment decisions (Black and Sufi, 2002), and both state and national unemployment rates have a positive relationship with college enrollments (Dellas and Sakellaris, 2003). However, Delaney and Doyle (2011) found no relationship between state unemployment rates and college enrollments. Therefore, the findings have been mixed, and the focus in most of these studies was not on institutional level data and not on the impact on public 4-year IHEs. Therefore, it has been difficult to determine the impact of variations in the national unemployment rate on public 4-year IHEs enrollments. These findings led to the development of the first hypothesis of the study, namely that a positive relationship exists between the national unemployment rate and undergraduate enrollments at

public 4-year IHEs. This study provides support for this hypothesis, showing that a one percent increase/decrease in the national unemployment rate prompts a 1.3 percent increase/decrease in enrollments at public 4-year IHEs.

As mentioned in the literature review (chapter two) various student level factors can impact universities, such as parental education, parental expectations of their children as they relate to education, peers' plans for attending a postsecondary institution, returns to a college degree, etc. An argument can be made that one of the drawbacks of this study is the inability to control for these student level characteristics. Even though we have been unable to control for these student level data, due to the nature of the dataset, scholars found that these student characteristics played a significant role in college enrollment, retention and attainment (Turner 2004; Perna & Titus, 2005; Goldrick-Rab, 2006; Stratton et al., 2007; Rocksa, 2011). The following section uses the literature to explore possible reasons of why the national unemployment rate has a positive relationship with enrollments at public 4-year IHEs.

First, the literature revealed a connection between parental educational achievement and college attendance and between parental education and the probability of enrollment in a 4-year IHE (Kane, 1994; Turner, 2004; Black & Sufi, 2002; Perna, 2005; Perna & Titus, 2005; Sandefur, et al., 2006; Goyette, 2008; Boffy-Ramirez, et al., 2010). Therefore, children whose parents were more educated were more likely to enroll in a 4-year IHE (Sandefur, et al., 2006, p. 540). Second, parental expectations in terms of their children education were influencing the probability of attending college, with children whose parental expectations related to high school completion being less

likely to enroll in a postsecondary institution than the ones whose parental expectations related to postsecondary attainment (Sandefur, et al., 2006). Third, the frequency of conversation related to education between parents and children were also determining factors in postsecondary enrollment (Perna & Titus, 2005; Sandefur, et al., 2006). Additionally, Perna and Titus (2005) found that peers and their plans in regards to enrolling in postsecondary education greatly influenced an individual's likelihood of enrolling in a postsecondary institution (p. 543).

Therefore, college enrollments can be influenced by a variety of factors some of which we were able to control for in our models, such as economic indicators, institutional level indicators, and parental education and others for which only access to student level data would have allowed control for. All in all, we have found support for the human capital investment theory and the fact individuals are likely to seize periods of decreased opportunity and enroll in a public 4-year institution. Therefore, these institutions are impacted by the variations in the economy as measured by the national unemployment rate.

This finding is relevant for the following reasons. First, it provides empirical support for the fact that public 4-year IHEs are impacted by unemployment rate increases. Second, since no other study has examined the relationship between the national unemployment rate and enrollments at public 4-year IHEs, the findings of this study add to the current body of scholarly literature. Third, this study provides higher education administrators, legislators, and/or policy makers with empirical evidence on enrollment trends in public 4-year IHEs during periods of economic expansion and

recession, as measured by the national unemployment rate. This evidence can help with resource allocation and enrollment management from the institutional, state, and national perspectives. For example, a recent series of articles have pointed to the fact that IHEs are facing significant difficulties recruiting students and that enrollments have dropped significantly in the past few years (e.g. Bidwell, 2013; Lederman, 2013; Fine, 2014). The past few years also coincide with a period of economic expansion. For higher education administrators, the findings of this study may be important, since more students or higher enrollments can translate into more revenues, which can translate into the university being able to offer more and better services to its student body. However, decreased enrollments usually point to the opposite scenario.

On the other hand, this finding also illustrates the fact that public 4-year IHEs may find themselves in a bind on a continuous basis. For example, this study's results point to the fact that during periods of increases in the national unemployment rate, enrollments increase; however, during these periods, state appropriations tend to decrease (Delaney & Doyle, 2011). In turn, when the national unemployment rate decreases, enrollments decrease with them, although state appropriations were found to increase (Delaney & Doyle, 2011). Therefore, IHEs located in states following funding models based on enrollments may be affected by funding issues on a continuous basis. On one hand, decreases in enrollments prompt decreases in revenues from tuition and fees. On the other hand, increases in national unemployment rates prompt increases in enrollments and decreases in revenues from state appropriations.

**Enrollment by gender.** Scholars have found mixed support when assessing how variations in state, national, and/or local unemployment rates impact the propensity of males and females to enroll in college. Dellas and Sakellaris (2003) found no differences in the college enrollment decisions of males and females when the state and national unemployment rates increased. Boffy-Ramirez, et al. (2010) found that male college enrollments “increased by 1.2 percentage points following a 1 percentage point increase in [national and/or state] unemployment rates, with the increase for women being smaller and statistically non-distinguishable from zero” (p. 10). However, no study has examined how male and female enrollments are impacted by variations in the national unemployment rate at 4-year public IHEs. Given these findings, the second hypothesis of the enrollment section was developed, predicting that males are more likely to enroll in college when the national unemployment rate increases.

This study shows that the relationship between enrollments and the national unemployment rate was positive and statistically significant for both males and females. However, the increase in enrollments was 59 percent higher for males (1.9%) than for females (1.2%). Put differently, males were found to be 59 percent more likely to increase/decrease enrollments in college than females when the national unemployment rate increased/decreased. It is not clear why males respond more strongly to the variations in the national unemployment rate than females. One explanation is provided by Rodgers (2013) who coined the most recent recession as a “men-cession” since the national unemployment rate for males was higher than for females. Figure 5.1 also illustrates this trend in the average annual unemployment rate for males for the entire period

of the study (1987-2010). Therefore males would be more likely to capitalize on decreased opportunity costs and advance their education during recessions since they are more likely to be unemployed.

This finding may have implications for college administrators, labor market trends, and the scholarly literature. First, this finding can assist higher education administrators with enrollment planning and management. Second, in relation to labor force trends, this research shows that while females enroll in higher numbers in college on a regular basis – as shown in figure 4.2 – men enroll in a higher percentage during recessions or periods of high unemployment. However, while periods of economic recession and expansion tend to occur on a cyclical basis, recessionary periods are shorter in duration than economic expansion periods. Therefore, economic implications may follow the fact that males enroll in college in overall smaller numbers than females. These college enrollment trends could point to a possible shift in the workforce, which may come to be dominated by women. Finally, this finding provides empirical evidence that male and female enrollments are impacted by variations in the national unemployment rate, and it adds to the body of scholarly literature as it relates to public 4-year IHEs. Plus, this finding supports the HCIT and shows that both males and females are likely to advance their educations during periods of lower opportunity costs; however, for males, these increases are higher than for females.

**Enrollment by race/ethnicity.** Scholars have found mixed results when examining

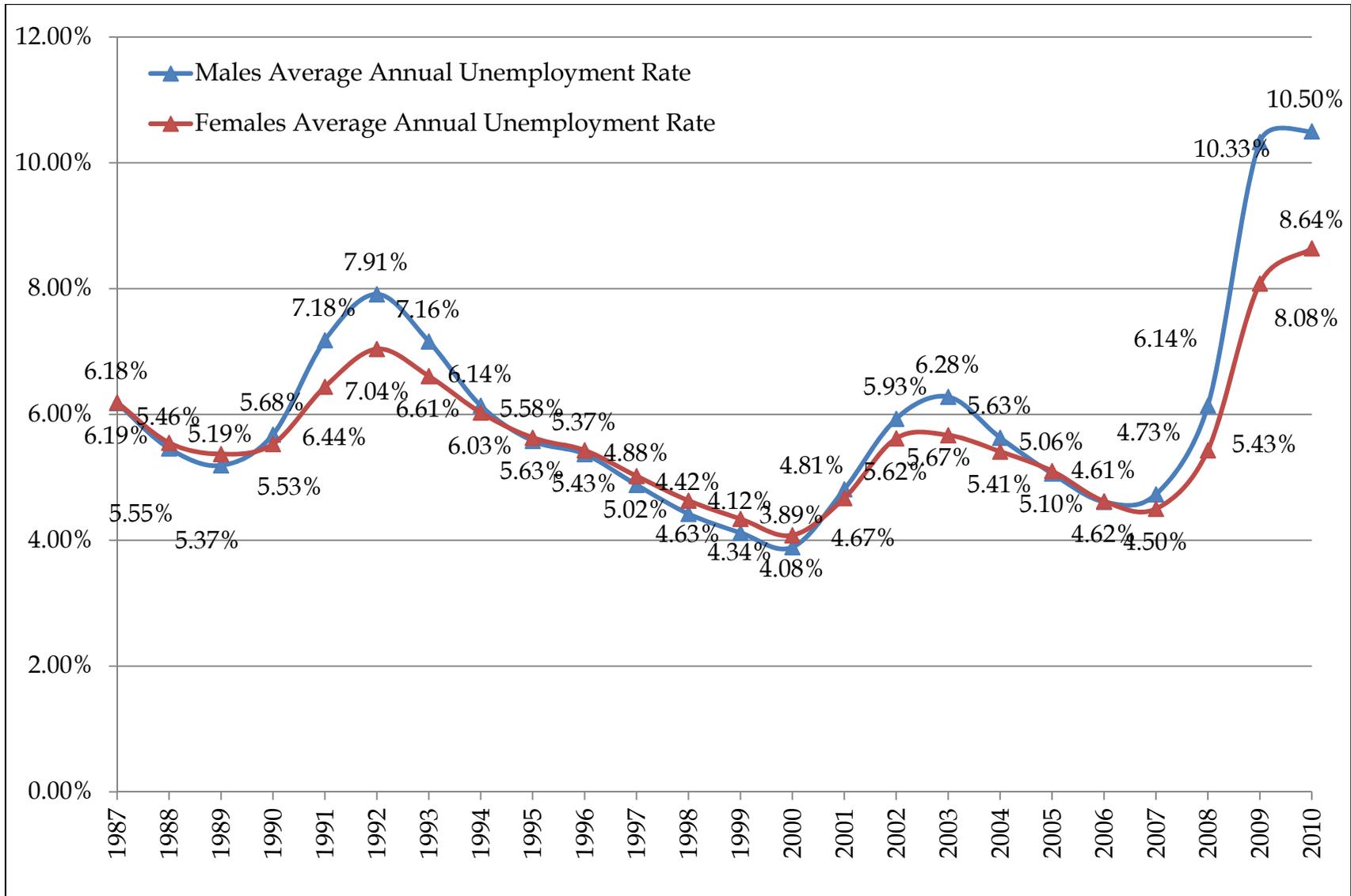


Figure 5.1. Average annual unemployment rates by gender.

the relationship between local, state, and/or national unemployment rates and college enrollments for students from different race/ethnicities. Kane (1994) found no relationship between the individual enrollment decisions of Blacks and Whites and the annual state unemployment rate. Black and Sufi (2002) found that local labor market conditions had a differential impact on student enrollments for students from different race/ethnicities as well and that the impact was statistically significant for Whites and almost statistically insignificant for Blacks (p. 19). Dellas and Sakellaris (2003) found a positive relationship between the enrollment rates of minority students and unemployment rates and a negative relationship between the enrollment rates of Whites and state and national unemployment rates. These findings led to the development of the second and third hypotheses of this study, namely that students from different race/ethnicities were likely to be impacted differently by variations in the national unemployment rate and Whites would be positively impacted by variations in the unemployment rate.

This study found support for both hypotheses. Specifically, enrollments of American Indians, Asians, and Hispanics in public 4-year IHEs had a negative relationship with the national unemployment rate, while enrollments of Blacks and Whites in public 4-year IHEs exhibited a positive one. These findings re-emphasize the gap in college enrollments, pointing to the fact that Whites continue to enroll in college at higher rates than students of other race/ethnicities.

It is worth noting that while a negative relationship was found between enrollments of American Indian, Asian, and Hispanic students at public 4-year IHEs,

and the enrollment percentages were quite large, 3.5%, 3.0% and 4.7%, respectively, these students were found to exhibit a delayed response to the national unemployment rate, reacting to the rate from two years ago. Therefore, increases in the national unemployment rate at time  $t-2$  led to decreases in enrollment at time  $t$ . This was an unexpected finding, considering that the number of traditional aged college Hispanics “hit an all-time high in October 2010” (Cardenas & Kerby, 2012, n.p.), when the national unemployment rate reached 9.6%, the highest level in the past 25 years.

Scholarly literature provides a partial explanation for these results. Scholars found that student characteristics related to race/ethnicity can explain enrollments in postsecondary institutions. Therefore, differences in enrollment in higher education by race/ethnicity could be attributed factors such as perceived benefits of a college degree, availability of funds to pay for college, cultural perspectives on debt, parental education, as well as the high school attended (Perna, 2005; Perna & Titus, 2005; Sandefur, et al., 2006; Cunningham & Santiago, 2008; Taylor, et al., 2010). Specifically, Perna (2005) found that Blacks and Hispanics underestimated the economic benefits of college when compared to Whites and that these perceptions have been reflected in enrollments patterns in postsecondary IHEs. Additionally, differences in enrollment in higher education by race/ethnicity and SES were found to be related to “differences in the supply of funds available to pay for the costs of an investment in higher education, including parental wealth, and availability of federal and financial aid” (Perna, 2005, p. 46).

Moreover, students of different race/ethnicities were found to have different predispositions towards borrowing for college and consequently different postsecondary attendance patterns (Cunningham & Santiago, 2008; Taylor, 2010). Cunningham & Santiago (2008) found that Asians and Hispanics were the most debt adverse students among all race/ethnicities categories. Asians were found to have the lowest “percentage of students borrowing to pay for college than all other groups” (p. 18). Plus, they were the least likely group to apply for and receive “financial support from any source,” including grants and loans (Cunningham & Santiago, 2008, p. 18). One reason was that in the Asian culture “debt was seen as a negative condition for families” and it was common for families to pool resources together to provide financial support a student in college as a way to minimize debt (Cunningham & Santiago, 2008).

Hispanic students were found to be the second most debt adverse category of students, refraining from borrowing to attend a postsecondary institution and being most likely ones to attend a 2-year IHEs due to cost constraints (Cunningham & Santiago, 2008). Hispanics debt aversion was explained by the fact that “they will have to pay them even if they do not complete college, and they [did] not think they can afford to take the chance” (p. 18). Another common perception was that quality education can be acquired at any type of IHE “as long as they are motivated” (p. 18). Hispanics were also found to have the highest probability of enrolling in 2-year colleges following high school graduation because they “are less expensive” (Cunningham & Santiago, 2008, p. 18), followed by Asians, Whites and Blacks (Perna & Titus, 2005, p. 505). Additionally, Hispanics and Blacks were found to have “lower levels of family

income [and] parental education” than Whites and Asians and were “concentrated in schools in the lowest quartiles of average family income and parental education” (Perna & Titus, 2005, p. 509).

Therefore, Asians and Hispanics were most likely to shift their attendance patterns and attend a community college, “delay entry in an effort to work and save money,” enroll part-time, or use savings or work income to finance their postsecondary education. Therefore, it may be that Hispanics and Asians are reacting to NUR from two years ago since cultural perspectives in regards to debt accumulation are likely to push them into community colleges and/or delay enrollments in a postsecondary institution until the economic conditions improve and funds are available.

Alternatively, my result shows that Blacks and Whites responded positively and immediately to increases in the national unemployment rate. They were found to increase enrollments in public 4-year IHEs by 1 percent and 1.4 percent, respectively with every one percent increase in the national unemployment rate at time  $t$ . Even though both Blacks and Whites were found to respond positively to variations in the national unemployment rate in terms of enrollment in public 4-year IHEs, the gap in college enrollments between them is still pronounced (see figure 4.3 – average annual enrollment by race/ethnicity). Perceptions related to debt can be one explanation for why these categories of students were more likely to enroll in public 4-year IHEs when the unemployment rate increased. Scholars found that Blacks and Whites were the least debt adverse students among all race/ethnicity categories. Blacks were found to be most likely to borrow to continue their education after high school at any type of IHE

(Cunningham & Santiago, 2008). Additionally, Black and Hispanic students were found to be more likely to apply for financial aid and work full-time than White students (Cunningham & Santiago, 2008). However, Blacks were found to be sensitive to college costs “in their decision to enroll in 4-year IHEs” (Kane, 1995; Perna & Titus, 2005, p. 508). Additionally, Taylor et al. (2010) found that minority students were more likely to attend 2-year colleges than 4-year IHEs, while Whites were found to be more concentrated in 4-year IHEs (p. 6).

Therefore, factors such as attitude towards debt, parental education, high school attended, and sensitivity to college costs can be used to explain at least in part the findings of my study - that Asians, Hispanics were negatively impacted by the variations in the national unemployment rate at time  $t-2$ , and that Blacks and Whites had a positive relationship with the national unemployment rate at time  $t$ .

Finally, Perna (2005) found that “rational human capital investment models do not accurately explain racial/ethnic or SES differences in college enrollment” (p. 47). Therefore, our findings as they relate to enrollments by race/ethnicity are in line with the literature in regards to the human capital investment theory. Similarly, we found that students from different race/ethnicity categories were indeed responding differently to the variations in the unemployment rate and some used while others ignored decreased opportunity costs associated with recessions from the perspective of enrolling in a public 4-year IHE.

This information may benefit both policy makers and higher education administrators, as it can assist in policy development to bridge the enrollment gap, as

well as to increase diversity and facilitate access to higher education. For example, policy makers can observe the economic environment and know that the demand for higher education is likely to decrease from Asians and Hispanics given their cultural perception towards debt. Therefore, they could direct funds towards community colleges where these students are likely to enroll due to the fact that community colleges are low cost options. Additionally, policy makers may want to consider targeting financial resources towards public 4-year IHEs during recessions so that access is preserved independent of the economic conditions. Finally, higher education administrators may want to develop targeted aid packages to attract these students to public 4-year IHEs.

**Enrollment by socio-economic status.** The third hypothesis of the enrollment section refers to socio-economic status and suggests that students from different SES quintiles will respond differently to variations in national unemployment rates. Plus, the students from the lowest and highest SES quintiles (Q1 and Q5) are more likely to enroll in college when the national unemployment increased than the ones from the middle quintiles (Q2-Q4). These hypotheses were developed based on the fact that students from the lowest quintile would be more likely to have access to college subsidies in the form of federal and state need-based grants and therefore be more likely to enroll in a public 4-year IHE when jobs are scarce. Alternatively, individuals from the highest SES are expected to increase enrollment in public 4-year IHEs since these individuals are likely to have access to funds independent of the state of the

economy, but be more likely to continue their education when jobs were scarce. Finally, individuals from the middle quintiles (Q2-Q4) were expected to decrease enrollments in public 4-year IHEs when jobs are scarce because they are more likely to be confronted with lack of funds, possible unavailability of family savings to subsidize education, be less likely to qualify for need-based financial aid especially in the form of grants (Baum & Payea, 2011).

My results showed mixed support for these hypotheses. Students from the two highest SES quintiles (Q4 and Q5) were found to have a positive relationship with the national unemployment rate, while the ones from the lowest quintiles were found to have a negative relationship with the national unemployment rate in terms of enrollments in public 4-year IHEs. Additionally, students from the middle SES quintile (Q3) exhibited a delayed positive response to increases in the national unemployment rate, increasing enrollment in public 4-year IHEs at time  $t$  (i.e. current year) when the unemployment rate increased at time  $t-2$  (i.e., two years ago).

The finding that students from the lowest SES quintiles (Q1 and Q2) were less likely to enroll in a public 4-year IHEs when the unemployment rate increased seem a bit counter-intuitive. However, the literature may provide some explanations. First, scholars found that parental education has implications for future generations because it leads to higher average income for the family and better potential for education for their children (Perna, 2005; Sandefur, et al., 2006). Consequently, families where one or none of the parents completed college were found to be lower income families and their children were found to be less likely to enroll in college due to lack of college advise,

guidance on how to access college funding, and difficulty navigating the complexity of the federal financial aid application process (Oliverrez & Tierney, 2005; King, 2006; Venezia, Kirst, Antonio, 2008; Cunningham & Santiago, 2008).

Second, scholars brought attention to the fact that families where one or none of the parents attended college were more likely to encounter difficulty in navigating the financial aid process. King (2006) noted that many students from low- and middle-income families do not apply for college and the much needed financial aid even though they are likely to qualify for it. The main reason was that the application process for Free Application for Federal Student Aid (FAFSA), was very complex, “confusing, inefficient [and] duplicative” requiring students and their parents to respond to more than 100 questions (Spellings, 2006; Scott, 2009). Therefore, students who would benefit most from FAFSA were the least likely to apply for it (Oliverrez & Tierney, 2005; King, 2006; Venezia, Kirst, Antonio, 2008; Cunningham & Santiago, 2008). All in all, the complexity of applying for federal financial aid through the Free Application for Federal Student Aid (FAFSA) before year 2010 may be one of the explanations for why students from the lowest income quintiles decreased enrollments in public 4-year IHEs when the unemployment rates increased. Following the reauthorization of HEA in 2008 the FAFSA form was simplified considerably, therefore it is likely that a similar study examining the same relationship over a different period of time may arrive to different results.

Third, Cunningham and Santiago (2008) found that that low-SES were more debt adverse than students from other SES categories. Lower SES student were unwilling to

borrow for attending any type of postsecondary institutions and altered postsecondary attendance patterns contingent on the funds availability (p. 16). Plus, parents' "limited or negative experience with credit was found to impact their children's willingness to take up credit to fund their education (p. 10). Additionally, high school counselors were more likely to advise low-SES students to attend a community college to prevent borrowing and potential loan defaults (p. 17). Therefore, students from lower SES backgrounds were found be more likely to attend part-time, unlikely to receive financial help from their parents, continue to work to fund their education, attend lower-cost IHEs, or community colleges to avoid going into debt, and/or delay college entry altogether. Therefore, it is likely that cycles of economic contraction could contribute to debt aversion and channel lower income students away from public 4-year IHE.

Forth, a recent Government Accountability Office (2014) report found that tuition increased in the past ten years. While these increases occurred at almost all IHEs in the United States, their impact was strongest for students from the lowest SES categories, as a portion of the total family income, as compared with the ones from the middle and higher SES categories. Therefore, a college education has become increasingly unaffordable students from the lowest SES categories as compared with the ones from the middle and high SES quintiles (Perna, 2005; Baum & Payea, 2011; GAO, 2014, p. 13). Additionally, when comparing tuition levels at public 2-year IHEs and public 4-year IHEs, between academic year 2003-2004 and academic year 2011-2012, tuition actually decreased at public 2-year IHEs for students from the bottom two SES quintiles and increased at public 4-year IHEs for the same students (GAO, 2014). Therefore, it is very

likely that due to increases in costs at public 4-year IHEs lower SES students are more likely to enroll in public 2-year IHEs rather than public 4-year IHEs when the unemployment rate increases.

Other reasons why lower SES students are less likely to enroll in a public 4-year IHEs when unemployment rate increased may be state support for higher education, perceptions of economic returns to a college degree, or a student's family size. Delaney and Doyle (2011) found that during periods of economic contraction state support for higher education decreases and the institutions may have less leeway in allocating funds for institutional aid in terms of grants for incoming students. Therefore, unavailability of institutional aid may deter lower SES students from enrolling in a public 4-year IHE. Perna (2005) found that students from lower SES had lower estimates of salaries of college graduates, therefore an inaccurate perception of the benefits of a college education. Therefore, students from the lower SES quintiles are more likely to decrease enrollments in public 4-year IHEs during times of economic contraction and shift their postsecondary attendance patterns by either selecting to attend 2-year IHEs, or enroll part-time, or delay entry until funds become available.

Another finding of this study is that students from the middle quintile (Q3) exhibited a delayed negative response to the variations in the national unemployment rates. Specifically, they were found to decrease enrollments in public 4-year IHEs when the national unemployment rate increased two years prior. Intuitively this finding makes sense and is in line with the literature since these students are likely to have less access to funds to subsidize their education and are more likely to wait the recession

out, work to accumulate funds to pay for their education, select lower costs postsecondary options, and/or delay enrollment in public 4-year IHEs (Cunningham & Santiago, 2008; Baum & Payea, 2011).

Finally, the current study found that the enrollments of individuals from top two SES quintiles in public 4-year IHEs had a positive relationship with the national unemployment rate. Scholars found that students from highest income quintiles are more likely to attend a 4-year IHE and have more educated parents than the ones from the rest of the income quintiles. On one hand, higher levels of parental education were found to be positively related to the overall family income and these parents were more likely to invest children's education (Sandefur et al, 2006, p. 539). Plus, higher levels of family income were found to be positively related with the probability of attending a 4-year IHE rather than a 2-year one (Perna & Titus, 2005; Sandefur, et al., 2006). Therefore, the finding of our study is in line with the literature.

The findings of the SES section showed that students from the top SES quintiles were more likely to enroll in college and therefore, were more likely than the ones from the two lowest SES quintiles to take advantage of the decreased opportunity costs when the national unemployment rate increased. At the same time, the rest considered other factors such as debt accumulation when making their decision to continue their education.

These findings provide empirical evidence that the national unemployment rate impacts undergraduate enrollments in 4-public IHEs, but its impact varies with socio-economic status. Second, since this relationship did not receive much attention in the

literature, this study provides some guidance on enrollment patterns at public 4-year IHEs. Finally, these findings can assist higher education administrators with planning for enrollment access and diversity and policy makers in developing future policies to assist students from all SES quintiles in terms of access to postsecondary education. Moreover, since students from the lowest SES quintiles were found to be more likely to enroll in public 4-year IHEs when the national unemployment rate decreased, this finding shows that the poverty cycle may be broken and access to education tends to be enhanced during periods of economic expansion.

**Enrollment summary.** All in all, mixed support was found for human capital investment theory when enrollments in public 4-year IHEs were examined using different student characteristics and these findings are in line with the literature. Perna (2005) found that “rational human capital investment models are not sufficient for understanding differences across groups in the demand for higher education” (p. 47) and they do not accurately explain racial/ethnic or SES differences in college enrollment” (p. 47).

Specifically, males and females, Blacks and Whites, and students from the top SES quintiles were found to increase enrollments in public 4-year IHEs when national unemployment rates increased and opportunity costs decreased. Alternatively, it may be that students from the middle to lowest quintiles, American Indians, and Hispanics shifted their attendance patterns and enrolled in private 2- or 4-year IHEs or public 2-year IHEs or delayed the start of their college education altogether when the economy

went through periods of high national unemployment due to debt aversion and funds unavailability. Future studies should focus on exploring this relationship at the national level and examining whether students from different SES quintiles are more likely to attend college when the national unemployment rate varies and, if they do, what type of IHE - public/private 2-/4-year - they tend to favor most for accessing an undergraduate education.

### **Retention**

While many studies have focused on exploring the impact of factors such as parental education, race/ethnicity, gender, etc., on the retention of first-year college students, only one study has examined the impact of local unemployment rates on college retention. Stratton, et al. (2007) found that local unemployment rates impact positively both full-time and part-time retention rates, but the relationship was statistically significant only for full-time students. Guided by the human capital investment theory and in the absence of additional literature, I hypothesized that a relationship exists between retention rates and the national unemployment rate at public 4-year IHEs. Specifically, I predicted that full-time retention rates would be positively related to the national unemployment rate and part-time retention rates would be negatively related. I further anticipated that full-time retention rates would be positively impacted by variations in the national unemployment rate, since full-time students would be more likely to stay in school and continue their studies when opportunity costs were low. Finally, I argued that part-time retention rates would be

negatively impacted by the national unemployment rate since part-time students would be more likely to work to support their studies and possibly be less likely to continue their studies when the national unemployment rate increased.

This study shows that full-time retention rates are, indeed, positively related to the national unemployment rate. In other words, students attending as first-time, full-time students during their freshmen year were found to be more likely to re-enroll either full- or part-time in their sophomore year when the national unemployment rate increased. However, no statistically significant relationship was found between part-time retention rates and the national unemployment rate. These findings are in line with the findings of Stratton, et al. (2007). Therefore, this study is one of the first to focus directly on the relationship between full- and part-time retention rates and the national unemployment rate.

The findings of this study are important for at least two reasons. First, they provide empirical evidence for a relationship between the national unemployment rate and full- and part-time retention rates at public 4-year IHEs. Second, administrators can benefit from these findings by knowing which categories of students are more likely to be retained during periods of economic expansion and/or contraction. In terms of human capital investment theory, the findings of this study point to the fact that full-time students are more likely to take advantage of lower opportunity costs and continue their education. The same, however, is not true for students attending college part-time in their freshmen year.

## **Completions**

The literature reveals that the relationship between state and/or national unemployment rates and college completion has received little attention from scholars. To date, two studies have examined the relationship between state unemployment and graduation rates indirectly (Arkes, 2010; Boffy-Ramirez, et al., 2010). Both studies found that high state and/or national unemployment rates impacted college attainment for students who experienced high unemployment rates during their teenage years. However, no studies have examined whether or not a relationship exists between college completions and the national unemployment rate or whether this relationship is likely to impact completions at public 4-year IHEs. Therefore, the last hypothesis of this study argues that students are more likely to graduate during periods of high national unemployment rates since funding for further schooling may have become an issue, due to possible increases in tuition and decreased state appropriations (Delaney & Doyle, 2011). Support was found for this hypothesis, as any one percent increase in the national unemployment rate was found to promote a 0.7% increase in college completions at public 4-year IHEs.

This finding is important from various perspectives. First, this finding adds to the body of scholarly literature as it relates to the examination of the factors impacting college completions at public 4-year IHEs. Second, this finding provides college administrators with empirical information on how the national unemployment rate impacts completions at public 4-year IHEs. Finally, in the context of the recent shifts in higher education towards performance-based funding and the fact that graduation or

completion tends to be a metric in these models, higher education administrators, legislators, and/or policy makers may choose to consider this metric in models to benefit the public 4-year IHE. In terms of placing this finding into the human capital investment framework, it shows that higher numbers of individuals complete their education when the national unemployment rate increases. However, it is not clear how likely students completing a bachelor degree during periods of high unemployment rates (low opportunity costs) are to continue their education by pursuing graduate degrees.

### **Limitations**

The major finding of this study is that a relationship exists between the national unemployment rate and college enrollment and success outcomes at public 4-year IHEs. The following section discusses the limitations of the study as they relate to the DCP dataset and data changes, as well as the generalizability of the study findings.

Undergraduate enrollment data by gender was missing from the DCP for multiple years, so these data were downloaded from IPEDS and paired with the DCP dataset by institution and year. Therefore, the sum of male and female enrollment columns will not coincide with the totals included in the total undergraduate enrollment numbers provided by DCP. The undergraduate enrollment total provided by DCP was included as the dependent variable of the study in the regression, while undergraduate male and female enrollments from IPEDS were included as dependent

variables in the regressions testing enrollments by gender. The values of the rest of the dependent variables used in this study were provided by the DCP dataset.

One of the main limitations of this study is the fact that college enrollment and success outcomes may be influenced by a multitude of personal as well as institutional factors that are not captured by the DCP dataset. First, a variety of factors can impact student success, such as parental education, academic preparation, parental status, marital status, age, gender, race/ethnicity, time of entry to the IHE, and academic ability (e.g., Kane, 1994; Black & Sufi, 2002; Turner, 2004; Goldrick-Rab, 2006; Stratton, et al., 2007; Goyette, 2008; Boffy-Ramirez, et al., 2010; McPherson & Shulenburger, 2010; Roksa, 2011). Second, while the DCP dataset focuses on institutional level data, it does not capture information related to specific initiatives and policies that have been proven to enhance college enrollment and success outcomes. Institution-specific policies, such as the involvement of students in campus activities, early intervention systems, or advising efforts, have been found to impact college retention and completion (e.g., Cox, Reason, Tobolowsky, Underwood, Luczyk, Nix, Dean, & Wetherell, 2012). Due to the fact that the focus of this study is on institutional-, rather than student-, level data, these factors could not be controlled for in our models. Therefore, a variety of other factors may play a role in explaining college enrollment and success outcomes, many of which were unaccounted for due to the limitations of the DCP dataset.

Additionally, this study uses secondary data; therefore, the researcher had no control over the process of data collection. However, given the fact that IPEDS data were collected in response to federal reporting requirements and the fact that IHEs can

face steep fines for misreporting data, a certain degree of confidence in the data used for this study exists (Cook & Pullaro, 2010). Additionally, a conversation with Mr. Richard Reeves, Program Director of the Postsecondary Institutional Studies Program (IPEDS) at NCES, U.S. Department of Education, revealed that DCP totals may not match IPEDS totals. He explained that due to the expenses incurred with changes in totals, updates to DCP were made only when these changes were significant (R. Reeves, personal communication, November 6, 2013).

Finally, this study examined the relationship between the national unemployment rate and college enrollment and success outcomes at 4-year public IHEs. While a significant amount of data were included in the study – about 500 IHEs, over a period of 24 years (1987-2010) – the findings of this study cannot be generalized to IHEs in other higher education sectors, such as public 2-years and/or private 2- or 4-years. Private IHEs tend to have different funding models; and, therefore, it is likely that during periods of variations in the national unemployment rate, they may react differently than public IHEs. In addition, since 2-year IHEs tend to be open access in terms of enrollment, their responses to variations in the national unemployment rate may be different in terms of success outcomes, such as retention and completions. Also, the findings of this study may not be generalizable to IHEs outside of U.S. since different countries have unique economic, demographic, and social patterns. For example, Sakellaris and Spilimbergo (1999) found that for non-OECD (Organization for Economic Cooperation and Development) countries, enrollment patterns are pro-cyclical; i.e., college enrollment increases with economic expansion (n.p.). All in all, the

findings of this study are generalizable only to public 4-year IHEs; however, this generalization should be made with great caution, keeping in mind the DCP dataset limitations.

### **Implications for Practice**

The purpose of this study is to examine the relationship between the national unemployment rate and college enrollment and success outcomes at public 4-year IHEs. This section discusses the recommendations for practice from the perspective of policy makers, higher education administrators, and scholars.

The intent of this study was to provide policy makers with empirical evidence that public 4-year IHEs are impacted by variations in the national unemployment rate. The results of the study show a relationship between variations in the national unemployment rate and enrollment, retention, and completion numbers of public 4-year IHEs. Considering that public 4-year IHEs rely on federal funding, state funding to a different extent, and have differential flexibility in setting their tuition levels, the results of this study can provide policy makers with empirical information and actionable data for policy development that can help advance national, state, and local goals. For example, policy makers may refer to the findings of this study to develop policies that can enhance access by providing more generous funding to IHEs to be used as need-based grants. In this manner, policy makers may help to break the poverty cycle by providing additional educational incentives for students from the bottom two SES quintiles.

This study also shows that undergraduate enrollments, full-time retention rates, completions are likely to increase when the national unemployment rate increases. However, in terms of enrollments, individuals from the lowest SES quintiles (Q1, Q2) are more likely to respond negatively to increases in unemployment rates. Therefore, policies could be devised to supplement the level of need-based financial aid and help these individuals break the cycle of poverty, acquire an education, and become more marketable in the labor market.

Additionally, this study provides a comprehensive image of how long-term business cycles impact public 4-year IHEs in terms of college enrollment and success outcomes, as well as how students with different characteristics (gender, race/ethnicity, socio-economic status) react to them. Plus, due to the fact that this study examines data for a period of 24 years, these results can help states and the federal government with long term planning and forecasting.

Moreover, the study can assist administrators at public 4-year IHEs with actionable information in regards to how variations in the national unemployment rate may impact their institutions in the long run. This study shows that students are more likely to enroll, be retained full-time, and complete their college degrees when the national unemployment rate increases. However, it is worth noting that students with different characteristics are likely to respond differently to increases in the national unemployment rate. For example, students from the two lowest SES quintiles are about 5 percent less likely to enroll when the national unemployment rate increases.

Additionally, students of race/ethnicities other than Black and White (American Indian,

Asian, and Hispanics) are likely to respond negatively, in terms of enrollment, to increases in the national unemployment rate from two years prior. . This type of empirical data can provide administrators with valuable information in terms of enrollment, the potential composition of freshmen classes, and overall campus diversity. Plus, it can assist them with planning, resource allocation, faculty and space needs, etc.

Finally, this study adds to the body of research available in regards to the relationship between the national unemployment rate and college success indicators. This is the first of its kind to examine the national unemployment rate and its association with college success indicators for public 4-year IHEs at the national level. Every public 4-year IHE in the United States is included in this study, and its evolution in terms of college success indicators is tracked over a period of 24 years. Moreover, this study takes a comprehensive look at the factors that may mediate the relationship between unemployment and college success as national, state, and institutional level indicators were included as control variables in the statistical models. Therefore, this study provides a national perspective on the relationship between the national unemployment rate and college enrollment and success outcomes, while also examining the impact of these factors on students with different characteristics (gender, race/ethnicity, and socio-economic status).

In conclusion, this study is meant to provide empirical and actionable data and analysis for policy makers and higher education administrators, as well as to contribute to the scholarly research in the area of higher education.

## **Recommendations for Future Research**

The following section provides a list of recommendations in regards to future research. First, since the last twenty years brought about many changes in the area of higher education, as well as in the way we access information, a re-evaluation of the impact of national unemployment rates on both public and private 2-year IHE enrollments and completions is warranted. Plus, a comparison between these two sectors may provide a more comprehensive picture in terms of schooling decisions when the economy goes through peaks and troughs to researchers and policy makers, as well as to higher education administrators.

Second, an exploration of how private 4-year IHEs respond to variations in the national unemployment rate is also suggested. Private 4-year IHEs tend to have higher flexibility in setting tuition and typically charge higher tuition levels to their students. They also tend to rely more on students and families than on the federal government or states for funding; therefore, it would be useful to see how college enrollment and success outcomes are impacted by variations in the national unemployment rate at these IHEs. Furthermore, a comparison of how public and private 4-year IHEs react to variations in the national unemployment rate in their college enrollment and success outcomes would provide a clearer picture of student preferences and movements contingent on variations in the national unemployment rate.

Third, it would be interesting to explore whether all the regions of the country respond the same to variations in the national unemployment rate. Specifically, it would be useful to see whether or not potential students from the Northeast region

respond similarly to ones from the Midwest region to variations in the national unemployment rate in terms of post-secondary enrollment, retention, and completion.

Finally, an exploration of graduate student enrollments and completions is suggested. It would be useful to see whether or not the investment in human capital findings of this study hold for graduate education. In other words, would individuals who witness increases in the national unemployment rate, and, consequently, a potential decrease in opportunity costs, be more likely to continue their educations by enrolling in graduate school or by completing a graduate degree? If that is the case, then what type of institutions (private or public 4-year IHEs) and what program levels (masters, professional, or doctoral) are likely to see the highest increases in enrollments and completions?

The additional studies mentioned above could provide scholars, policy makers, and higher education administrators a comprehensive picture of the response of the population in regards to schooling. Policies could be devised to assist individuals with different characteristics, contingent on their responses to variations in the unemployment rates, to enroll and complete their educations.

### **Conclusion**

The purpose of this study was to explore the relationship between the national unemployment rate and indicators of college success (enrollment, retention, and completion), controlling for student characteristics (gender, race/ethnicity, and socioeconomic status) and macroeconomic factors such as state unemployment rates,

gross domestic product, gross state product, per capital personal income at the national and state levels, state appropriations per IHE, federal funds, and other variables for all the public 4-year universities in the United States. The study provided empirical, actionable information for policy makers and higher education administrators, as well as researchers.

Human capital investment theory served as the theoretical framework for the study (Becker, 1962). This theory posits that people are more likely to invest in human capital activities (i.e. education) when opportunity costs decrease, or during high unemployment spells. The study used pooled time-series panel data covering a period of 24 years (1987-2010) and focused on exploring the relationship between variations in the national unemployment rate and college enrollment and success outcomes at the undergraduate level for all public 4-year IHEs in the United States..

The study found that college enrollment and success outcomes are impacted by variations in the national unemployment rate. A positive relationship was found between the national unemployment rate and undergraduate enrollment, full-time retention, and college completions. However, the impact was different for students with different characteristics (gender, race/ethnicity, and socioeconomic status). Both males and females were found to increase enrollments in public 4-year IHEs when the national unemployment rate increased. Students from different race/ethnicities were found to increase (Blacks and Whites) or decrease (American Indian, Asian, and Hispanics) enrollments in public 4-year IHEs when the national unemployment rate increased. Finally, students from the lowest SES quintiles (Q1, Q2) were found to

decrease enrollments, while the ones from the mid- to highest quintiles (Q3-Q5) were found to increase enrollments when unemployment rates increased.

Future research is needed to assess if these relationships hold for private 4-year IHEs as well as public and private 2-year IHEs. This research can help scholars, policy makers, and higher education administrators to gain a better understanding of the student distribution in higher education institutions at the national level when the national unemployment rates go up or down. This understanding could lead to development of policies that would better serve the needs of the population and the country.

## APPENDIX A

### LIST OF VARIABLES

| VARIABLES                          | DESCRIPTION   | SOURCE   |
|------------------------------------|---|--|
| <b>Primary Dependent Variables</b> |   |  |
| <b>Enrollment</b>                  |   |  |
| Total undergraduates               | Total number of undergraduates enrolled at an institution in the fall of the academic year  | Delta Cost Project   |
| Total females                      | Total number of females enrolled at an institution during the fall of the academic year   | Integrated Postsecondary Educational Data System (IPEDS) – historical file |
| Total males                        | Total number of males enrolled at an institution during the fall of the academic year   | IPEDS historical file  |
| Total American Indian              | Total number of students having origins in any of the original peoples of North America and who maintain cultural identification through tribal affiliation or community recognition enrolled at an institution during the fall of the academic year  | Delta Cost Project   |
| Total Asian                        | Total number of students having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands. This includes people from China, Japan, Korea, the Philippine Islands, American Samoa, India, and Vietnam, enrolled at an institution during the fall of the academic year | Delta Cost Project   |
| Total Black                        | Total number of students having origins in any of the black racial groups of Africa (except those of Hispanic origin) enrolled at an institution during the fall of the academic year   | Delta Cost Project   |
| Total Hispanic                     | Total number of students of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race, enrolled at an institution during the fall of the academic year  | Delta Cost Project   |
| Total White                        | Total number of students having origins in any of the original peoples of Europe, North Africa, or the Middle East (except those of Hispanic origin) enrolled at an institution during the fall of the academic year.   | Delta Cost Project   |

|                          |  |                    |
|--------------------------|--|--------------------|
| SESQ1                    | Includes the total number of students applying for financial aid: (1) whose dependent FTI(FISAP total income) is below \$15,000 in current dollars; and (2) whose independent FTI(FISAP total income) is below \$5,000 in current dollars                                | Delta Cost Project |
| SESQ2                    | Includes the total number of students applying for financial aid: (1) whose dependent FTI(FISAP total income) is between \$15,000 and \$29,999 in current dollars; and (2) whose independent FTI(FISAP total income) is between \$5,000 and \$9,999 in current dollars   | Delta Cost Project |
| SESQ3                    | Includes the total number of students applying for financial aid: (1) whose dependent FTI(FISAP total income) is between \$30,000 and \$41,999 in current dollars; and (2) whose independent FTI(FISAP total income) is between \$10,000 and \$13,999 in current dollars | Delta Cost Project |
| SESQ4                    | Includes the total number of students applying for financial aid: (1) whose dependent FTI(FISAP total income) is between \$42,000 and \$59,999 in current dollars; and (2) whose independent FTI(FISAP total income) is between \$14,000 and \$19,999 in current dollars | Delta Cost Project |
| SESQ5                    | Includes the total number of students applying for financial aid: (1) whose dependent FTI(FISAP total income) is at or above \$60,000 in current dollars; and (2) whose independent FTI(FISAP total income) is \$20,000 or more in current dollars                       | Delta Cost Project |
| <b>Retention</b>         |  |                    |
| Full-time retention rate | Annual percent of students retained from the previous year's fall first-time full-time cohort (minus exclusions) that re-enrolled at the institution as either full-time or part-time the following fall   | Delta Cost Project |
| Part-time retention rate | Annual percent of students retained from the previous year's fall first-time part-time cohort (minus exclusions) that re-enrolled at the institution as either full-time or part-time the following fall   | Delta Cost Project |
| <b>Completions</b>       |  |                    |

|                                      |  |                             |
|--------------------------------------|--|-----------------------------|
| Total completions                    | Total number of awards conferred (baccalaureate or equivalent degree, as determined by the Secretary, U.S. Department of Education) that normally require at least 4 but not more than 5 years of full-time equivalent college-level work. This includes all bachelor's degrees conferred in a 5-year cooperative (work-study) program. A cooperative plan provides for alternate class attendance and employment in business, industry, or government; thus, it allows students to combine actual work experience with their college studies. Also includes bachelor's degrees in which the normal 4 years of work are completed in 3 years | Delta Cost Project          |
| <b>Primary Independent Variable</b>  |  |                             |
| National Unemployment Rate           | The annual national unemployment rate  | Bureau of Labor Statistics  |
| <b>Control Variables</b>             |  |                             |
| <b>Macroeconomic Variables</b>       |  |                             |
| Gross Domestic Product               | Annual gross domestic product  | Bureau of Economic Analysis |
| Per Capita Personal Income           | Annual per capita personal income at the national level  | Bureau of Economic Analysis |
| Gross State Product                  | Annual gross state product   | Bureau of Economic Analysis |
| Per Capita Personal Income per State | Annual per capita personal income at the state level   | Bureau of Economic Analysis |
| State Unemployment Rate              | Annual unemployment rate per state   | Bureau of Labor Statistics  |
| <b>Institutional Variables</b>       |  |                             |
| In-state Tuition                     | Total amount charged to an in-state full-time undergraduate student by an institution that covers tuition and required fees.   | Delta Cost Project          |
| Out-of-state Tuition                 | Total amount charged to an out-of-state full-time undergraduate student by an institution that covers tuition and required fees.   | Delta Cost Project          |

|                          |   |  |
|--------------------------|---|--|
| State Appropriations     | Total revenues received by the institution through acts of a state legislative body (except grants and contracts and capital appropriations) each year. | Delta Cost Project                           |
| <b>Federal Variables</b> |   |  |
| High School Graduates    | Total number of high school graduates per year  | United State Department of Education (USDOE) |
| Pell Grants              | Total amount of Pell grant dollars received by an institution on a yearly basis   | USDOE  |
| Loans                    | Total amount of loan dollars received by an institution on a yearly basis   | USDOE  |
| Work-study               | Total amount of funds received by an institution on a yearly basis  | USDOE  |

## REFERENCES

- Adam, A. J., & Gaither, G. H. (2005). Retention in higher education: A selective resource guide. *New Directions for Institutional Research*, 2005(125), 107-122.
- Arkes, J. (2010). Using unemployment rates as instruments to estimate returns to schooling. *Southern Economic Journal*, 76(3), 711-722.
- Becker, G. S. (1962). Investment in human capital: A theoretical analysis. *The journal of political economy*, 70(5), 9-49.
- Becker, G. S. (1993). *Human capital: A theoretical and empirical analysis with special reference to education* (3rd ed.). Chicago: University of Chicago Press.
- Bidwell, A. (2013, Dec. 12). College Enrollment Falls for Second Year in a Row. The US News and Worlds Report. Retrieved from <http://www.usnews.com/news/articles/2013/12/12/college-enrollment-falls-for-second-year-in-a-row>
- Breneman, D. W. (2002). For colleges, this is not just another recession. *The Chronicle Review*. Issue from June 14, 2002.
- Breneman, D. W. (October 10, 2008). What colleges can learn from recessions past. *The Chronicle of Higher Education*. 55 (7).
- Betts, J. R. and McFarland, L.L. (1994). Safe port in a storm. The impact of labor market conditions on Community College enrollments. *The Journal of Human Resources*. 30 (4)
- Black, S.E., and Sufi, A. (2002). Who goes to college? Differential enrollment by race and family background. NBER Working Papers. National Bureau of Economic Research. October 2002.
- Boffy-Ramirez, E., Hansen, B., & Mansour, H. (2010). *The effect of business cycles on educational attainment*. Discussion paper.
- Baird, K. (2006). Access to college: the role of tuition, financial aid, scholastic preparation and college supply in public college enrollments. *Journal of Student Financial Aid*, 36(3), 16-38.
- Baum, S., & Payea, K. (2011). Trends in student aid: 2011.
- Berman, E. M. (2006). *Essential statistics for public managers and policy analysts*. CQ Press.

- Berman, E. & Wang, X. (2012). *Essential statistics for public managers and policy analysts*. 3rd Edition, CQ Press.
- Creswell, J. W. (2013). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage.
- Cooke, S. (2003). Information technology workers in the digital economy. *Digital Economy* 2003, 19-32.
- Cardona, A. R. (2009). Eight Ways to Retain Students in a Tough Economy. *Chronicle of Higher Education*, 55(33).
- Card, D. & Lemieux, T. (2001) Dropout and enrollment trends in postwar period: what went wrong in the 1970s. *Risky Behavior among Youths: An Economic Analysis*. January 2001.
- Cook, B., & Pullaro, N. (2010). *College graduation rates: Behind the numbers*. American Council on Education.
- Cox, B. E., Reason, R. D., Tobolowsky, B. F., Underwood, R. B., Luczyk, S., Nix, S., Dean, J., & Wetherell, T. K. (2012). *Linking institutional policies to student success: Initial results from a five-state pilot study*. Tallahassee: Florida State University's Center for Higher Education Research, Teaching, and Innovation. Retrieved from <http://cherti.fsu.edu/LIPSS/>
- Cunningham, A. F., & Santiago, D. A. (2008). Student Aversion to Borrowing: Who Borrows and Who Doesn't. *Institute for Higher Education Policy*.
- Dickey, A. K., Asher Jr, E. J., & Tweddale, R. B. (1989). Projecting headcount and credit hour enrollment by age group, gender, and degree level. *Research in Higher Education*, 30(1), 1-19.
- Dellas, H., Sakellaris, P. (2003) On the cyclicity of schooling: theory and evidence. *Oxford Economic Papers*. (55) pp. 148-172.
- Dellas, H., Koubi, V. (2003) Business cycles and schooling. *European Journal of Political Economy*. (19) pp.843-859
- Delaney, J. A., & Doyle, W. R. (2011). State spending on higher education: Testing the balance wheel over time. *Journal of Education Finance*, 36(4), 343-368.

- Fain, P. (2014, May 15). Nearing the Bottom. Inside Higher Ed. Retrieved from <https://www.insidehighered.com/news/2014/05/15/new-data-show-slowing-national-enrollment-decline>
- Fry, R. (2009). The changing pathways of Hispanic youths into adulthood. Pew Hispanic Center.
- Fry, R. and Parker, K. (2012). Record shares of young adults have finished both high school and college. Pew Research Center: Social and Demographic Trends.
- Ferreira, F. H., & Schady, N. (2009). Aggregate economic shocks, child schooling, and child health. *The World Bank Research Observer*, 24(2), 147-181.
- Feirris, D., Peeples, J., & Castro, M. (2011). First to second year retention & six-year graduation rates: An analysis by social identity groups at the campus and college level. *Undergraduate Education Institutional Research Report*. March 2011.
- Goyette, K. A. (2008). College for some to college for all: Social background, occupational expectations, and educational expectations over time. *Social Science Research*, 37(2), 461-484.
- Goldrick-Rab, S. (2006). Following their every move: An investigation of social-class differences in college pathways. *Sociology of Education*, 79(1), 67-79.
- Government Accountability Office (2014). State Funding Trends and Policies on Affordability. (GAO-15-151), Washington, D.C.: U.S. Government Printing Office.
- Hoover, E., & Keller, J. (2011). More students migrate away from home. *The Chronicle of Higher Education*.
- Humphreys, B. R. (2000). Do business cycles affect state appropriations to higher education?. *Southern Economic Journal*, 398-413.
- Holley, K., & Harris, M. (2010). Selecting Students, Selecting Priorities: How Universities Manage Enrollment during Times of Economic Crises. *Journal of College Admission*, 207, 16-21.
- Hsiao, C. (2003). Analysis of panel data (2nd ed.). New York: Cambridge University Press.
- Juhn, C., & Potter, S. (2006). Changes in labor force participation in the United States. *The Journal of Economic Perspectives*, 20(3), 27-46.

- Johnson, Burke & Christensen, Larry. (2012). *Educational Research: Quantitative, Qualitative, and Mixed Approaches, 4th Edition*. Los Angeles, CA: SAGE Publications
- Kiley, K. (2013, April 30). Crowded out. *Insider Higher Ed*. Retrieved from <http://www.insidehighered.com/news/2013/04/30/out-state-enrollment-decreases-minority-low-income-student-enrollment>
- Kane, T.J. (1994). College entry by Blacks since 1970: The role of college costs, family background, and the returns to education. *Journal of Political Economy*. 102 (5)
- King, J. E. (2006). Missed opportunities revisited: New information on students who did not apply for financial aid. *ACE Center for Policy Analysis*.
- Lederman, D. (2013, May 17). Enrollment Decline Picks-Up. *Inside Higher Ed*. Retrieved from <https://www.insidehighered.com/news/2013/05/17/data-show-increasing-pace-college-enrollment-declines>
- McPherson, P., & Shulenburg, D. (2010). Expanding undergraduate education to meet national goals: The role of research universities. *Change: The Magazine of Higher Learning*, 42(1), 51-56.
- Oliverez, P. M. and Tierney, W. G. (2005). Show us the money. Low-income students, families, and financial aid. *Center for Higher Education Policy Analysis*. University of Southern Carolina.
- Perna, L. W. (2005). The benefits of higher education: Sex, racial/ethnic, and socioeconomic group differences. *Review of Higher Education*, 29, 23-52.
- Perna, L. W., & Titus, M. A. (2004). Understanding differences in the choice of college attended: The role of state public policies. *The Review of Higher Education*, 27(4), 501-525.
- Perna, L. W., & Titus, M. A. (2005). The relationship between parental involvement as social capital and college enrollment: An examination of racial/ethnic group differences. *Journal of Higher Education*, 485-518.
- Roksa, J. (2011). Differentiation and work: inequality in degree attainment in US higher education. *Higher Education*, 61(3), 293-308.
- Rumberger, R. W. (2010). Education and the reproduction of economic inequality in the United States: An empirical investigation. *Economics of Education Review*, 29(2), 246-254.

- Rodgers III, W. M. (2013). Employment: a labor economist's response to Hanna Rosin's "end-of-men" hypothesis. *BUL Rev.*, 93, 815-1205.
- No Author (n.a.) (2004). The persisting racial gap in college student graduation rates. *The Journal of Blacks in Higher Education*. (45), p. 77-85.
- Sandefur, G. D., Meier, A. M., & Campbell, M. E. (2006). Family resources, social capital, and college attendance. *Social Science Research*, 35(2), 525-553.
- Stratton, L. S., O'Toole, D. M., & Wetzel, J. N. (2007). Are the factors affecting dropout behavior related to initial enrollment intensity for college undergraduates?. *Research in Higher Education*, 48(4), 453-485.
- Singell Jr, L. D. (2004). Come and stay a while: does financial aid effect retention conditioned on enrollment at a large public university?. *Economics of Education Review*, 23(5), 459-471.
- Spellings, M. (2006). *A test of leadership: Charting the future of US higher education*. US Department of Education.
- Scott, G. A. (2009). Federal Student Aid: Highlights of a Study Group on Simplifying the Free Application for Federal Student Aid. Report to Congressional Committees. GAO-10-29. *US Government Accountability Office*.
- St. John, E. P. (2003). *Refinancing the college dream: Access, Equal Opportunity, and Justice for taxpayers*. Baltimore, MD: The Johns Hopkins University Press
- Sakellaris, P. and Spilimbergo, A. (1999). Business cycles and investment in human capital: International evidence on higher education. Electronic Working Papers 99-009, University of Maryland, Department of Economics.
- Tandberg, D. A., & Hillman, N. W. (2014). State Higher Education Performance Funding: Data, Outcomes, and Policy Implications\*. *Journal of Education Finance*, 39(3), 222-243.
- Tandberg, D. A., Dorius, S. F., & Cram, B. (2014). Black student enrollments and returns to education rankings: A multilevel analysis of the determinants of the institutional variation in returns to higher education. (working paper).
- Turner, S. (2004). Going to college and finishing college. Explaining different educational outcomes. National bureau of Economic Research: College Choice: The economics of Where to Go, When to Go, and How to Pay for it.

Venezia, A., Kirst, M. W., & Antonio, A. L. (2008). Betraying the college dream: How disconnected K-12 and postsecondary education systems undermine student aspirations.

US Department of Education (2009). Report to Congress on efforts to simplify the Free Application for Federal Student Aid (FAFSA).

Woodhouse, K. (2012, October 25). Enrollment trends: Out-of-state students form 42.6 percent of University of Michigan's freshman class. *The Ann Arbor News*. Retrieved from <http://www.annarbor.com/news/university-of-michigan-sees-increase-in-out-of-state-students/>

Reeves, R. (2013, November 6). Telephone interview.

Zhao, J., Ren, L., & Lovrich, N. P. (2012). Political culture versus socioeconomic approaches to predicting police strength in US police agencies results of a longitudinal study, 1993 to 2003. *Crime & Delinquency*, 58(2), 167-195.

## Notes

[1] Explaining the Unemployment Rate: [http://www.bls.gov/cps/cps\\_htgm.htm](http://www.bls.gov/cps/cps_htgm.htm)

[2] IPEDS Retention <http://nces.ed.gov/ipeds/glossary/?charindex=R>

[3] The Business Cycle and the Unemployment Rate:  
<http://www.nber.org/cycles/recessions.html>

[UR definition 2]  
<http://jobsearch.about.com/od/unemployment/g/underemploymentrate.htm>

[UR definition] <http://www.businessdictionary.com/definition/unemployment-rate.html>

[DCP] description <http://www.deltacostproject.org/about-us>

[BLS] Bureau of Labor Statistics (BLS) Major Economic Indicators:  
<http://www.bls.gov/bls/newsrels.htm#major>

[October CPS] <http://nces.ed.gov/surveys/cps/>

[BLS NUR] [http://www.bls.gov/cps/cps\\_htgm.htm](http://www.bls.gov/cps/cps_htgm.htm)

[BEA] [http://www.bea.gov/iTable/index\\_regional.cfm](http://www.bea.gov/iTable/index_regional.cfm)

[USDOE] <http://www2.ed.gov/finaid/prof/resources/data/pell-institution.html>

[SC] standardized beta coefficients <http://www.jerrydallal.com/LHSP/importnt.htm>

[BLS College Enrollments]

[http://www.bls.gov/news.release/archives/hsgec\\_04272010.pdf](http://www.bls.gov/news.release/archives/hsgec_04272010.pdf)

## **BIOGRAPHICAL SKETCH**

Ms. Diana Barbu joined Florida State University's doctoral program in higher education during the fall of 2010, after already working in higher education for more than a year.

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