The Pennsylvania State University

The Graduate School

College of Earth and Mineral Sciences

HIGHER EDUCATION IN THE UNITED STATES:

A HISTORICAL, DESCRIPTIVE, AND SPATIAL ANALYSIS

A Dissertation in

Geography

by

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Submitted in Partial Fulfillment
of the Requirements
for the Degree of

Doctor of Philosophy

August 2014
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ABSTRACT

This dissertation represents the first historical, descriptive, and spatial analysis of higher education in the United States. The principal contribution of the dissertation is a database which allows for multiple ways to visualize and investigate spatial patterns of institutions of higher education (hereafter, IHE). The lack of a geo-referenced database of the nation’s IHE previously inhibited the spatial analysis of the U.S. higher education system as a whole. The secondary contribution of the dissertation is identifying a series of factors that influenced the spatial patterns of IHE. Educational, federal, state, and demographic factors have shaped the geography of IHE and enrollment in the U.S.

Literature reviews trace the history of U.S. higher education from the founding of Harvard in 1636 through to the twenty-first century. Maps of the historical spread of IHE set the review of literatures within a spatial context. Periods of structural change in U.S. higher education between 1939 and 2007 are identified. Traditional and spatial statistical analyses for IHE and their enrollments were conducted using the dissertation database. Results are presented across multiple spatial scales, including the nation, state, and ZIP Code™ levels. A notable finding of the dissertation is that the spatial core of “traditional” IHE has remained in the Northeast. Western and southern states could not “catch up” with the Northeast in terms of the concentration of either four-year or private, non-profit IHE relative to the college-aged population. However, western states compensated for the lack of private, non-profit IHE by establishing public and two-year IHE.

Scholars have examined the post-WWII expansion of U.S. higher education in great detail, yet the analysis of higher education change from a geographic perspective previously has been limited. This dissertation fills a recognized research void with two contributions:
the creation of a spatial database of IHE and the preliminary interpretation of spatial patterns of IHE in light of educational, federal, state, and demographic factors. A third contribution, in the longer run, will be making the database available to other researchers and policy makers.
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ACKNOWLEDGMENTS

It is only fitting that writing a geography dissertation should be journey. The journey for me was filled with the best of times and the worst of times. However, everything along the journey enabled me to turn a discussion with Glenda Laws into a dissertation I am proud to call my own. This journey would not have been possible without the unwavering support and patience of Roger Downs. I truly am grateful for Roger’s thoughtful guidance in every stage of the dissertation process. I sincerely thank Rod Erickson for his considerate advice and calming presence throughout my time at Penn State. I also give thanks to Stephen Matthews and Irwin Feller for providing valuable advice and commentary.

This journey could not have been completed without the loving and constant support of my family. I have the best parents, Norman and Patricia Adams, who always have shown me love and believed in me. The love of my husband, Craig Williams, has enabled me to happily live every day to the fullest. Moreover, Craig’s unflailing belief in and support of me helped me finally finish my dissertation. Last, but not least, I dedicate this dissertation to my daughter, Beatrix. She truly is the light of our lives. I hope to continue to show her that anything is possible with love, patience, and dedication.
Part I

THE FRAMEWORK
Chapter 1
INTRODUCTION

Some people have even speculated that, in our present age of enormous emphasis on skill, the university may soon become as characteristic an institution in America as the church was three hundred years ago (Veysey, 1965: ix-x).

1.1. Introduction

Geographers study the changing patterns of institutions and industries across space and through time. Institutions of higher education (hereafter, IHE) (see List of Abbreviations) form a major industrial sector and provide a fundamental service, yet their analysis from a spatial perspective has been limited. Even basic inquiries into where particular types of IHE are located, either across the nation or at smaller geographic scales (i.e., within regions, states, counties, and ZIP Codes™), are lacking (Fonseca and Andrews, 1993; Adams, 1998). Consequently, neither geographers nor higher education scholars have sufficiently addressed how and why the current spatial arrangement of IHE developed in the United States. This dissertation represents a historical, descriptive, and spatial analysis of higher education in the United States. The present chapter sets the context for the dissertation by defining the contributions of the research, identifying existing literatures within geography and higher education, and outlining the structure of the dissertation.

1.2. Research contributions

The principal contribution of the dissertation is a spatial database which allows for multiple ways to visualize and investigate spatial patterns of IHE (see Chapter 2). The lack of a geo-referenced database of the entire nation’s IHE has inhibited the spatial analysis of the U.S. higher education system as a whole. Thus, the database designed specifically for the
dissertation research is invaluable to understanding the historical and spatial patterns of
IHE over time. Future plans to make the database available to other researchers (see
Chapter 7) will permit even greater spatial understanding of U.S. higher education.

The secondary contribution of the dissertation is identifying a series of factors that
influenced the spatial patterns of IHE. Chapter 3 introduces the four explanatory factors:

- the educational context,
- the federal context,
- the state-level context, and
- the demographic context.

Each factor shaped the geography of higher education institutions and enrollment in the
U.S., yet the implications of changing educational, federal, state, and demographic influences
on IHE previously have been overlooked in geographic research.

1.3. Geography and higher education in literature

There have been historical (McCune, 1968) and modern (Olds, 2004, 2009; Thiem,
2009; Erickson, 2012) appeals for the spatial study of education within geography.
Likewise, education scholars have noted the potential benefits of geographic analyses
within their discipline (i.e., Riddle, 1989; Gulson and Symes, 2007). Despite a recognized
research void, research into “‘geography education’ has, in the United States, been taken to
exclude what in the United Kingdom is referred to as the geography of education” (Bednarz,
et al., 2003: 463). When geographers have examined U.S. higher education, their research
may be classified into one of four areas.

Firstly, the most prevalent line of inquiry linking geography and higher education
compiled essays on the linkages between IHE and learning regions which follow this
tradition, as do theses and dissertations in geography (e.g., Murray, 2006; Kim, 2004; Ziolkowski, 2004) and economics (i.e., Wang, 2004; Groen, 2002). Spatial research by geographers and economists in this vein acknowledge that IHE influence local (Beeson and Montgomery, 1990; Smith, 1990; Saxenian, 1994; Howells, 2002; Smith, 2011) and regional (Castells and Hall, 1994; Caniëls and van den Bosch, 2011; O’Neal and Lasrado, 2012) economies in terms of research and development (hereafter, R&D) (Geiger and Feller, 1995; Henderson, et al., 2001; Buzard and Carlino, 2008), high-technology centers (Florida and Kenney, 1990; Hall, 1997; Smilor, et al., 2007), technology transfer (Feller, 1997; Abreu and Grinevich, 2013), and the supply of new graduates (Kodrzycki, 1999).

Secondly, there have been a number of topical studies of higher education from a spatial perspective. Theobald’s research into foreign-born geography faculty in the U.S. (2007) and in Colorado (2008) is an example of this analysis vein. Gumprecht’s (2003: 51) “concise portrait” of college towns in the U.S. also falls into this category. Additional topical inquiries into higher education include Torbenson’s (1992) study of the diffusion of fraternities and sororities in the U.S., Fisher’s (1988) analysis of the origins of four-year IHE in west Texas, and McConnell’s (1965), Kariel’s (1968), and Medwick’s (2010) examinations of the spatial variability of college enrollment.

Thirdly, geographers have studied the characteristics of specific IHE. Examples of institution-based inquiries include Godwin’s (2008) study of the consumers of distance education courses at Montana State University, Carroll and Smith’s (2006) analysis of the economic impact of Bowling Green State University, and Turner’s (2003) research into the demographic and geographic accessibility of the University of Virginia. Dissertations in education, geography, and/or political science also have examined the effects of specific IHE
on their surrounding urban (Cortes, 2002; Eisenstein, 2005) or service areas (Tjaden, 2001).

Finally, several atlases of U.S. higher education exist (Fonseca and Andrews, 1993; Council of State Governments, 1952; Millett, 1952). While these atlases provide detailed maps and data about U.S. higher education, the atlas format offers minimal interpretation and explanation of spatial patterns. One exception is Andrews’ and Fonseca’s (1998) overview of U.S. community colleges, which includes a detailed study of the two-year college system in Virginia.

One commonality within existing research linking geography and higher education is a relatively limited scope and scale: systematic study of the U.S. higher education system as a whole is lacking. This dissertation expands existing research and inquiry into the geography of higher education in two ways. Firstly, the database designed and created for the dissertation permits some of the first extensive analyses of U.S. higher education over space and through time. Secondly, a series of educational, federal, state, and demographic factors coalesced to shape the history and geography of U.S. higher education after World War II (hereafter, WWII). Analyzing the database and interpreting the analyses in light of these factors yields a greater historical and spatial understanding of higher education institutions and enrollment in the U.S.

1.4. Dissertation outline

The dissertation is formally divided into three sections. Part I establishes the methodological (Chapter 2) and contextual (Chapter 3) framework of the dissertation. Chapter 2 presents the database design, data sources, and methodology for the dissertation. The selections of time periods and institutions are explained, data sources and variables are
delimited, and analytical measures are detailed. Chapter 3 identifies the four explanatory factors underlying the dissertation’s historical, descriptive, and spatial analysis of U.S. higher education. Each factor is identified, explained, and set within interdisciplinary literatures.

Part II includes the historical, descriptive, and spatial analyses of the dissertation. Chapter 4 traces the history of U.S. higher education from the founding of Harvard in 1636 through to the twenty-first century. Maps of the historical spread of IHE set the review of literatures within a spatial context. Chapters 5 and 6 contain the results of empirical analyses for IHE (Chapter 5) and their enrollments (Chapter 6). Within each chapter, the findings are organized by spatial scale of analysis, which includes the nation, state, and point (i.e., ZIP Code™) levels. Traditional statistical applications (e.g., location quotient, hereafter LQ) and spatial statistical methods (e.g., hot spot analysis) are employed across space and over time. Empirical findings are interpreted in light of the explanatory factors described in Chapter 3. Maps within the chapters use small multiples (Tufte, 1983) for optimal spatio-temporal display.

Part III contains the concluding chapter of the dissertation. Chapter 7 highlights the contributions of the dissertation and summarizes the findings of the research. In addition, the value of the dissertation’s database is examined, particularly with regard to the potential futures of U.S. higher education.
Chapter 2
THE METHODS

Analysis of the spatial distribution of universities within countries would . . . add to an understanding of patterns of university founding . . . . The spatial distribution of universities should be systematically examined over time to describe the distribution, and to identify changes over time (Riddle, 1989: 166).

2.1. Introduction

The study of U.S. higher education from a geographic perspective previously has been limited by the lack of a database joining institutions of higher education (IHE) with basic geographic and institutional characteristics. The database constructed for this dissertation links institutional characteristics of IHE across seven decades with the geo-referenced locations of those IHE, thereby enabling the first multi-scale, longitudinal analyses of the universe of two- and four-year IHE in the U.S. Therefore, the principal contribution of this dissertation is the creation of a spatial database permitting the investigation and visualization of changes in the locations, numbers, characteristics, and enrollment of IHE across space and through time. The present chapter describes the methodological aspects of the dissertation. The procedures for designing (Section 2.2.) and constructing (Section 2.3.) the database are detailed, and the methods of historical, descriptive, and spatial analysis of the database are explained (Section 2.4.).

2.2. Database design

2.2.1. Time periods

There are two complementary temporal scales of analysis within the dissertation. The beginning date of study differs for each time period based upon the scope and nature of the
analyses. Within the literature-based component of the dissertation (Chapter 4), the history of U.S. higher education is detailed from the founding of Harvard in 1636 through to the twenty-first century. Examining higher education from its inception to the recent day provides both historical and current contexts to the dissertation’s descriptive and spatial analyses.

Within the analytical component of the dissertation (Chapters 5 and 6), one time period is utilized: 1939 to 2007. There are two reasons for selecting this time frame as the focal period for analyses. Firstly, key federal, state, socioeconomic, and demographic factors shaped U.S. higher education both before and after WWII (see Chapter 3). Understanding how this series of factors coalesced to influence the provision of U.S. higher education from before WWII through to the twenty-first century is essential to understanding the history and geography of U.S. higher education. Secondly, although this study emphasizes changes in IHE and their enrollment after World War II (WWII), the collection and analysis of data for IHE and enrollment prior to WWII provides a baseline for comparative purposes.

2.2.2. Institutions of higher education

The set of IHE in the database was compiled using data from the U.S. Department of Education (hereafter, USDE) (see Section 2.3.1. for sources). The database designed for the dissertation includes the universe of IHE offering (1) at least two, but less than four, years or (2) four or more years of postsecondary instruction within the fifty U.S. states and the District of Columbia. The specific types of IHE which fall into these two categories, and which are included in the database, include: junior and/or community colleges offering associate’s degrees; professional schools offering associate’s degrees and/or certificate programs; and IHE offering bachelor, master, and/or doctoral degrees.
The selection of IHE outlined herein excludes institutions offering less than two years of postsecondary education. Less-than-two-year IHE consist “mostly of vocational/technical and other occupationally-oriented schools” (Kroe, 1992: ix). Less-than-two-year schools are considered to be postsecondary institutions, but they generally are not said to offer “college-level” work (Center for Statistics, 1986: vii), which is why they were not included in the database. “College-level’ means a postsecondary associate, baccalaureate, postbaccalaureate, or rabbinical education program” (Center for Statistics, 1986: vii).

In addition to being restricted to “college-level” IHE, the database also is limited to those IHE which were accredited by an association or agency recognized by the USDE (see Appendix A).\(^1\) Accreditation first emerged in the 1900s as a way to “protect the integrity of the institutions against outside pressures and to protect society against educational frauds” (Council of State Governments, 1952: 57).\(^2\) Despite its continued role of ensuring consistency and quality within U.S. higher education, accreditation always has been voluntary for IHE in the U.S. However, the importance of institutional accreditation increased after WWII, when accrediting associations were called upon to determine the eligibility of institutions for federal funding. That made what had been a voluntary procedure more mandatory than voluntary for most institutions (Glidden, 1996: 1).

---

\(^1\) The database includes all IHE which were either accredited at the college level by a recognized agency or which had attained pre-accredited status [i.e., recognition that an institution was “progressing toward accreditation” (Center for Statistics, 1986: xi)].

\(^2\) This research is interested in accreditation only as “a status granted to an educational institution or program that has been found by its peers . . . to meet stated criteria concerning educational quality and accomplishment” (Christal and Jones, 1985: 1). Examining the processes, methods, and activities of accreditation is outside the scope of this dissertation. See Harcleroad (1980), Selden (1960), and Semrow, et al. (1992) for detailed treatment of these issues.
From a federal perspective, there are two key dates in accrediting history in the post-WWII era. Firstly, veterans flooded into IHE using federal funds from the WWII (1945), Korean War (1952), and Vietnam (1966) G.I. Bills. Secondly, Title IV of the Higher Education Act of 1965 (National Council of Higher Education Resources, 2012) opened the door to federal funding for non-veteran students attending IHE. Both the Higher Education Act and the G.I. Bills stipulated that students using those federal programs must attend accredited U.S. IHE. Therefore, even though institutional accreditation continues to be voluntary, accreditation became an implicit requisite for IHE by the 1960s, as IHE competed for students and their federal funding. Restricting the dissertation database only to accredited IHE provides a greater understanding of how federal factors (see Chapter 3, Section 3.3.) contributed to changes in the spatial structure of U.S. higher education after WWII.

2.3. Data sources and variables

2.3.1. Institutions of higher education

Based on the preceding criteria, institutional information was collected for 5,339 “college-level,” accredited IHE which were open at any time between 1939 and 2007. The database includes 544 IHE that were either closed or acquired (i.e., IHE which ceased operating independently, but which merged with another IHE) between 1939 and 2007 (see

3

The function, methods, and role of regional accreditation agencies have been debated (Casey and Harris, 1979; Marchese, 1991). Nontraditional IHE (i.e., private, for-profit IHE and online degree programs) have created new challenges for accrediting agencies (c.f., Hall, 1979; Council for Higher Education Accreditation, 2002; see Chapter 4, Section 4.4.5).
A combination of six data sources was used to collect the majority of institutional information:

- the *Integrated Postsecondary Data Survey (IPEDS)* (USDE, Institute of Education Sciences, National Center for Education Statistics, 2009),

- the *Higher Education General Information Survey (HEGIS)* (USDE, 1970),


- the *2009 Higher Education Directory* (Burke, 2009),

- the *College Blue Book* (Hurt, 1940, 1947, 1949; Burckel, 1956, 1965; Russell, 1969; Burgess, 1972), and


Using multiple data sources was essential to the validity of the data collection process. Prior to the creation of the dissertation database, there was no single source that combined institutional, enrollment, and geographic data for U.S. IHE. The comprehensive data collection enabled the coding of each IHE within the database across four variable categories: identification, geography, institutional characteristics, and enrollment. A complete variable list is provided in Appendix B. Variables analyzed within the dissertation

4 Compiling a geographically-linked database accounting for all closures, mergers, and acquisitions of IHE since 1636 is beyond the scope of this dissertation. See Tewksbury (1932) for an examination of IHE which closed prior to 1861, Marshall (1995) for an analysis of four-year IHE which closed prior to 1973, and Brown (2013) for a continually-updated listing of mergers, closures, and name changes.
are described below. Variable names are referenced throughout the dissertation text in CAPITALS.

2.3.1.1. Identification

Every institution in the database was identified by UNITID, FICE code, and NAME. The UNITID and FICE code are identifiers unique to an institution; using these variables helped ensure that each institution was entered only once in the database. While all IHE receive a UNITID from the USDE, only institutions accredited by a recognized agency or association are assigned the unique six-digit FICE code by the USDE’s Federal Interagency Committee on Education (FICE).

2.3.1.2. Geography

The geographic depiction of higher education previously has been limited by a lack of geo-referenced data. This dissertation represents the first attempt to assemble and analyze higher education data at multiple spatial scales over time. In analyses spanning multiple geographic scales, it is essential to address the complexities of spatial data with regard to the consequences of grouping data (i.e., aggregation effects), which may falsely alter the correlation between variables (i.e., scale effects). Specifically, combining the same data across multiple geographic scales or using different enumerations within one scale may either over- or under-state the magnitude of an effect or occurrence during analyses (Openshaw, 1977, 1983), a phenomenon known as the Modifiable Areal Unit Problem (hereafter, MAUP) (Gehlke and Biehl, 1934; Johnston, et al., 1994; Unwin and Unwin, 1998; O’Sullivan and Unwin, 2002).
The database design utilizes two ways of diminishing both the scale and aggregation effects of the MAUP:

- collecting data at the point level and
- analyzing data at the point level when possible.

Firstly, aggregation effects associated with the MAUP are minimized when data are collected at the smallest unit possible (here, the point level). The five-digit ZIP Codes™ (ZIP) of IHE were identified from addresses in a USDE (USDE, Institute of Education Sciences, National Center for Education Statistics, 2009) database. ZIP were then used to obtain the geographic coordinates (i.e., latitude and longitude) of the IHE for spatial data analyses. The STATE and COUNTY locations of each institution were identified as well. For mapping purposes, IHE were coded using Census state codes (popularly known as FIPS codes). IHE also were located within Census regions and divisions (CENDIV) (Table 2.1., Figure 2.1.).

<table>
<thead>
<tr>
<th>Census region</th>
<th>Census division</th>
<th>Constituent areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northeast</td>
<td>New England</td>
<td>CT, MA, ME, NH, RI, VT</td>
</tr>
<tr>
<td></td>
<td>Middle Atlantic</td>
<td>NJ, NY, PA</td>
</tr>
<tr>
<td>Midwest</td>
<td>East North Central</td>
<td>IL, IN, MI, OH, WI</td>
</tr>
<tr>
<td></td>
<td>West North Central</td>
<td>IA, KS, MN, MO, ND, NE, SD</td>
</tr>
<tr>
<td>South</td>
<td>South Atlantic</td>
<td>DC, DE, FL, GA, MD, NC, SC, VA, WV</td>
</tr>
<tr>
<td></td>
<td>East South Central</td>
<td>AL, KY, MS, TN</td>
</tr>
<tr>
<td></td>
<td>West South Central</td>
<td>AR, LA, OK, TX</td>
</tr>
<tr>
<td>West</td>
<td>Mountain</td>
<td>AZ, CO, ID, MT, NM, NV, UT, WY</td>
</tr>
<tr>
<td></td>
<td>Pacific</td>
<td>AK, CA, HI, OR, WA</td>
</tr>
</tbody>
</table>

Figure 2.1.: Census division boundaries

Secondly, analyzing data at the smallest practical unit reduces the problems associated with the MAUP. Hot spot analyses were conducted at the point (i.e., X and Y coordinate or ZIP) level to ensure minimal data scale and aggregation effects. In instances where point-level analyses were not practical, analyses are performed using areal units that either are relevant to the organization of IHE or are recognized boundaries. For example, states are appropriate units of analysis because (1) states constitute formally recognized boundaries and (2) public systems of IHE are organized at the state level. The combined use of the aforementioned techniques reduces the effects of the MAUP within the database, thereby, minimizing the inappropriate use of spatial data within the analyses.

2.3.1.3. Institutional characteristics

IHE in the database were coded across seven institutional characteristic variables selected to facilitate the investigation and visualization of spatial patterns in IHE:

- **ESTAB**: the year an institution was established. The database follows the USDE standard in using the year in which an institution came into existence or was chartered as its founding date. Establishment dates for the majority of IHE within the database were compiled using the sources listed in Section 2.3.1. When an establishment date could not be verified using traditional sources, every effort was made to determine ESTAB using institutional web sites and Internet searches (sources available from the author).

- **CLSD**: the year an institution closed and/or merged with another institution, if applicable. Closures were verified using the sources listed in Section 2.3.1., the resources of Brown’s (2013) directory, and institutional web sites.

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5 Other authors use different conventions for determining an institution’s founding date. Riddle (1989) used the year in which both a formal graduate school existed and at least one doctoral degree was awarded. Marshall (1995) used the first year a degree was awarded.
• **ACCRED:** the year an institution was accredited. Accreditation data were compiled using the sources listed in Section 2.3.1. Institutional (see Appendix A) and program-level accrediting organizations are listed in the database.

• **LEVEL:** the highest level of study offered by an institution. In the database, IHE were coded either as offering (1) at least two, but less than four, years or (2) four or more years of postsecondary instruction.

• **CONTROL:** the particular interest group with which an institution is associated. In the database, IHE were classified into one of three non-overlapping categories: public; private, non-profit; or private, for-profit.

• **SECTOR:** combines both the LEVEL and CONTROL variables to produce a single classification of IHE. SECTOR data were available for 1990, 2000, and 2007 (USDE, Institute of Education Sciences, National Center for Education Statistics, 2009). Prior to 1986, the USDE did not publish SECTOR data. SECTOR data were computed by the author using the LEVEL and CONTROL variables for years prior to 1990 (USDE, 1970; USDE, Institute of Education Sciences, National Center for Education Statistics, 2009).

• **UNIQUE:** variables providing information about IHE established under special circumstances or designed to serve a particular group of students. The three variables within this category use a binary classification system: IHE either are or are not part of these institution types. LGRNT identifies IHE designated as land-grant institutions under the first and second Morrill Acts. HBCU is used to denote historically black institutions. TRIBAL identifies IHE controlled by a Native American entity.

2.3.1.4. Enrollment

Total fall enrollment (ENRL) data were collected for 1939, 1949, 1960, 1970, 1980, 1990, 2000, and 2007. Data for 1939 (Hurt, 1940), 1949 (Federal Security Agency, 1952), and 1960 (U.S. Department of Health, Education, and Welfare, 1962) were not available electronically, and were hand-entered into the database. Data for 1970 through 2007 were

---

6 Data for 1940 and 1950 were not available, which is why data for 1939 and 1949 were substituted.
available electronically (USDE, 1970; USDE, Institute of Education Sciences, National Center for Education Statistics, 2009). In addition, enrollment data were available and were collected for students across sex (i.e., MALE or FEMALE) and ETHNICITY (i.e., White, Black, Hispanic, Asian, Indian, non-resident alien, no race identified) for 1980 through 2007 (USDE, Institute of Education Sciences, National Center for Education Statistics, 2009).

2.3.2. Population

Population data were collected at the state level using the National Historical Geographic Information System (NHGIS) (Minnesota Population Center, 2004). Data were collected for total population (POP) and college-age population (i.e., persons 18 to 29 years of age) (CAPOP) (Minnesota Population Center, 2004). Regional population counts (REGPOP) were calculated by aggregating state-level data for Census divisions (see Table 2.1.).

2.4. Historical, descriptive, and spatial analyses

Part II of the dissertation contains the results of historical, descriptive, and spatial analyses of U.S. higher education. The primary contribution of the dissertation is a database linking institutional and geographic data for U.S. IHE. Changes in the characteristics of IHE and enrollment are examined spatially and temporally within both the literature (Chapter 4) and empirical (Chapters 5 and 6) analyses. Analytical results are interpreted through an understanding of a series of educational, federal, state, and demographic factors, the exploration of which is the secondary contribution of the dissertation. The procedures and

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7 The database uses USDE (USDE, Institute of Education Sciences, National Center for Education Statistics, 2009) designations in reporting and discussing student ethnicity.
techniques for literature and empirical analyses are detailed below.

2.4.1. Higher education history in spatial context

Chapter 4 sets the history of higher education in a spatial context. Literature reviews within the chapter emphasize changes in institutional characteristics, variations in founding patterns, and fluctuations in enrollment trends over time and across space. Maps of institution founding (ESTAB) at the ZIP level augment the review of literatures.

2.4.2. Descriptive and spatial analyses of the database

Chapters 5 and 6 present the findings of the empirical analyses of the database for IHE and enrollment, respectively. Analyses used traditional and spatial statistics to identify and describe patterns of change in IHE and enrollment over space and through time. Empirical results are mapped and graphed using small multiples (Tuft, 1983), which permit visual comparability of time-series data. Within Chapters 5 and 6, findings are presented at the national, state, and point levels. Nesting the spatial hierarchy of results reduces the effects of the MAUP (see Section 2.3.1.2.) and extends the understanding of U.S. higher education across multiple spatial scales.

2.4.2.1. Nation-level analyses

At the national level, several layers of data description provide a basis for understanding historical and spatial change in U.S. higher education. Nation-level data discussions emphasize changes in the numbers of IHE and students between 1939 and 2007. Firstly, counts of IHE (Chapter 5) and students (Chapter 6) for each study year (i.e., 1939, 1949, 1960, 1970, 1980, 1990, 2000, and 2007) were derived from institutional
establishment dates (ESTAB). Secondly, the sums of IHE (Chapter 5) and enrollment (Chapter 6) were analyzed across LEVEL and CONTROL. Thirdly, in Chapter 6, enrollment is analyzed across SEX and ETHNICITY for 1980, 1990, 2000, and 2007.

2.4.2.2. State-level analyses

The nation-level analyses of higher education change provide a crucial context for understanding patterns of change for IHE (Chapter 5) and their enrollments (Chapter 6) within states. Traditional statistical analyses at the state levels mirror the descriptive techniques used at the nation level. Firstly, counts of IHE (Chapter 5) and enrollment (Chapter 6) for each study year were derived from institutional establishment dates (ESTAB) across states. Secondly, the populations of IHE (Chapter 5) and students (Chapter 6) were analyzed across LEVEL and CONTROL at the state level for each study year. Thirdly, in Chapter 6, enrollment is analyzed across SEX and ETHNICITY for states between 1980 and 2007.

In addition, the concentrations of IHE (see Chapter 5, Section 5.3.) and students (see Chapter 6, Section 6.3.) across states also were calculated across using location quotients (LQ). LQ calculations also were performed for IHE and enrollment across LEVEL and CONTROL. The LQ statistic relates the concentration of a phenomenon relative to population. Thus, the LQ is defined as “a measure of relative spatial incidence normalized to unity” (Scott, 1988: 49). The LQ is best utilized as a means of identifying patterns and benchmarks for further examination (Isard, 1960), which makes it a particularly useful measure for descriptive spatial analyses. Using the LQ, the concentration of a particular phenomenon within a unit can be interpreted as being over-represented (i.e., disproportionately more than would be expected), under-represented (i.e.,
disproportionately less than would be expected) or represented in the same proportion as the broader population (see Smith, 1975; Johnston, et al., 1994). Although the LQ has not been previously applied as a means of understanding the geography of higher education, geographers have used the LQ as a means of identifying spatial patterns of human capital (Florida, 2002), segregation (Brown and Chung, 2006), employment (e.g., Ellis, et al., 1993), and industrial specialization (e.g., Scott, 1988; Keeble and Nachum, 2002).

In the dissertation, the LQ is used to determine how the concentrations of IHE and their enrollments vary over time relative to the college-aged population (i.e., persons aged 18 to 29) (CAPOP). The following equations show the calculation of the LQ:

\[
LQ (\text{CAPOP}) = \frac{\text{IHE (or enrollment) in STATE}}{\text{IHE (or enrollment) in the U.S.}} \div \frac{\text{CAPOP in STATE}}{\text{CAPOP in the U.S.}}
\]

The LQ calculations yield an index measuring the number of IHE (or students) in a state relative to the concentration in the nation as a whole. The LQ results are described, compared, and contrasted within Chapters 5 and 6. The findings reveal state-level over- and under-representation in the concentration of IHE and enrollment in the U.S. between 1939 and 2007.

2.4.2.3. Point-level analyses

The Getis-Ord G\(^*_i\) (Ord and Getis, 1995, 2001; Getis and Ord, 1996) statistic yields individual standardized results for every point in the system. Therefore, the G\(^*_i\) statistic is called a "local" measure of spatial association. Local statistics may be used to analyze spatial patterns for smaller geographic extents (i.e., the point level).
Statisticians and geographers have developed a series of new approaches to the analysis of spatial data that rely on methods involving the mapping of what have been called local statistics in an exploratory framework. Typically, the aim is to learn more about each individual datum by relating it in some way to the values observed at neighbouring locations often by using visualization of the resulting maps as a direct analytical procedure (Unwin and Unwin, 1998: 416).

The $G'_i$ statistic is a local, additive statistic in that it "compare[s] local (weighted) averages to global averages to check for ‘hot spots’" (Getis and Ord, 1996: 262), “cold spots,” or clusters of activity. Recent applications of hot spot analysis include uncovering variations in homelessness (Rukmana, 2011) and West Nile Virus (Carnes and Ogneva-Himmelberger, 2012). Using the hot spot analysis spatial statistics tool within ArcMap™ (Esri® Inc., 2013), the $G'_i$ statistic was calculated at the point level for IHE (Chapter 5) and enrollment (Chapter 6). The results of the $G'_i$ computations generated a standardized z-score value for each ZIP. The z-scores were rendered and mapped using small multiples.

2.5. Summary of the methods

Spatial analysis of U.S. higher education change previously has been hindered by a lack of geo-referenced data. The principal contribution of this research is the spatial database created for the dissertation. The database permits multi-scale, longitudinal analyses of higher education change, allowing for multiple ways to visualize and investigate spatial patterns of higher education in the U.S. The use of spatial (i.e., hot spot analysis) and traditional (i.e., LQ) statistics provides new insights into higher education historically, descriptively, and spatially. The secondary contribution of the dissertation is a preliminary exploration of the spatial patterns of IHE as they are related to a series of educational, federal, state, and demographic factors which shaped U.S. higher education in the post-WWII period (see Chapter 3).
Chapter 3

THE CONTEXT

Instead of a simplistic alternative which defines schooling as either the passive product of society or the active motor of progress, the relationship between higher education and social change is circular and interdependent with both transforming each other (Jarausch, 1983: 9).

3.1. Introduction

The dissertation's primary contribution is the creation of geo-referenced database of institutions of higher education (IHE). The database expands the potential for understanding and visualizing patterns of U.S. higher education over time, and it provides the basis for historical, descriptive, and spatial analyses of IHE in the post-World War II (WWII) era. The dissertation's secondary contribution is identifying a series of factors that influenced the geography of higher education institutions and enrollment after WWII. Chapter 3 introduces the four explanatory factors that have shaped the spatial patterns of IHE in the U.S:

• the educational context,
• the federal context,
• the state context, and
• the demographic context.

Within the chapter, each factor is identified, explained, and set within key parts of interdisciplinary literatures. The chapter concludes by exploring how the factors coalesced to shape the history and geography of U.S. higher education after WWII.

3.2. The educational context

The importance of education in U.S. society is deeply rooted in the belief that education produces more productive and, therefore, more valuable citizens (e.g., Spaulding, 1920).
There is a strong literature tradition regarding education as a public and private good (e.g., Levin, 1987; Levin, 2000; Levin and Belfield, 2003). The notion of education as a private good relates to the idea of human capital (e.g., Kellerman, 1985), while the idea of education as a public good concerns the impacts of education on society more broadly (e.g., Dewey, 1970). The public-private nexus (Levin, 2000) of education creates challenges for educational policymakers, who are forced to balance public-sector issues and private-sector concerns (Wolfe and Haveman, 2002).

In the United States, both the federal government (see Section 3.3.) and individual state governments (see Section 3.4.) have direct and indirect influence on public and private IHE alike. Because education is a major public expense, government expenditures on education constrain capacity and resources and, thus, define the parameters of educational expansion and reform (Hall, 1981). Federal and state influence forged an "intimate" but complex relationship between IHE and the state (Veysey, 1965). At the basis of this relationship is the public purpose that IHE provide. "The public function argument concerns a combination of . . . factors . . . which indicate a dependence by the state on private institutions in meeting state educational needs" (Hendrickson, 1973: 73). Specifically, states rely on both public and private IHE to educate their citizens because "universities were organized and sustained to support and advance society and the general good of the community and state" (Dressel, 1980: viii). Thus, even private higher education serves a public good and, therefore, cannot be viewed as separate from the state.
Government spending on education can be viewed as an investment in physical, human, and social capital. Physical capital includes facilities and equipment for education, which provide essential physical infrastructure for places as well (Kirn, 1987; Chapman and Walker, 1991). Human capital "consists of teaching, administrative, and other services at all levels of the education system and scientific and R&D services both inside and outside of the educational establishment" (O’Connor, 1973: 101). Human capital encompasses “talent,” which is measured by Florida (2002: 743) as the attainment of a bachelor’s or higher degree. Researchers have explored the positive relationships among educational attainment, skilled labor, knowledge production, and economic development/prosperity (e.g., Smith, 1937; Eide, 1966; Cohn and Geske, 1990; Drucker, 1993; Berry and Glaeser, 2005). For example, Lange and Topel (2006) found a high correlation between human capital and productivity in the U.S. between 1940 and 2000. Moreover, the creation and sustenance of a skilled labor force depends upon the development and maintenance of formal educational systems (Benavot and Riddle, 1988).

Whereas human and physical capital can be “measured” through wages, educational attainment, and infrastructure, social capital is more difficult to define Eastis (1998). Coleman (1988: S98) developed the idea of social capital, which is “defined by its function” across social structures. Social capital exists within the family and/or within the community (Coleman, 1988). The social capital of IHE includes consumer services (e.g., teaching, socialization, residential services, food services, and other support services). In addition, the social capital of education creates and establishes a way for individuals to

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Physical, human, and social capital are dissertation topics in and of themselves. My interest herein focuses solely on introducing the notions of human and social capital as they relate to the historical and national context of the expansion of U.S. higher education.
participate in broader social processes (e.g., Dewey, 1970). For example, there is a recognized correlation between education and democracy at the social level. “Schools socialize young people and political involvement is one form of socialization; a variety of evidence shows a positive connection between education and civic engagement” (Glaeser, et al., 2007: 94).

There are recognized linkages between human and social capital, changing economic structures, and the rising importance of a higher education. A shift from farm-based to non-farm employment in the U.S. during the nineteenth century coincided with increasing numbers of high school and college-level graduates, as well as growing numbers of students in general. The declining demand for agricultural workers contributed to an increase in the proportion of workers employed in non-farm occupations. The percent of workers employed in non-farm occupations was:

- 59 percent in 1900,
- 78.5 percent in 1930,
- 84 percent in 1945,
- 96 percent in 1970, and
- 98.1 percent in 2000 (Dimitri, et al., 2005).

As the proportion of U.S. workers employed in non-farm occupations rose steadily after 1900, educational attendance increased as well. In 1910, less than 14 percent of U.S. residents aged 25 and older had completed high school and fewer than 3 percent had completed four or more years of college (Table 3.1). In forty years, completions more than doubled; more than one-third of U.S. residents had completed high school and 6 percent had completed four or more years of college by 1950. High school and college completions both

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2 Farm-related occupations include agriculture, fishing, forestry, and hunting. Non-farm occupations include goods-producing industries (e.g., manufacturing, mining, construction) and service-producing industries (e.g., business services, information, health, education, government, the arts).
grew considerably after 1960. In addition, there was an increased "credentialism," in which the high school diploma became a minimal requirement for entry into most occupations" (Caplow, et al., 1991: 472). High school completions surpassed 50 percent by 1970 and grew to 87 percent by 2010. Bachelor’s degree completions more than doubled between 1970 and 2010 as well.

<table>
<thead>
<tr>
<th>Year</th>
<th>High school completion or higher</th>
<th>Bachelor's or higher degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1910</td>
<td>13.5</td>
<td>2.7</td>
</tr>
<tr>
<td>1920</td>
<td>16.4</td>
<td>3.3</td>
</tr>
<tr>
<td>1930</td>
<td>19.1</td>
<td>3.9</td>
</tr>
<tr>
<td>1940</td>
<td>24.5</td>
<td>4.6</td>
</tr>
<tr>
<td>1950</td>
<td>34.3</td>
<td>6.2</td>
</tr>
<tr>
<td>1960</td>
<td>41.1</td>
<td>7.7</td>
</tr>
<tr>
<td>1970</td>
<td>55.2</td>
<td>11.0</td>
</tr>
<tr>
<td>1980</td>
<td>68.6</td>
<td>17.0</td>
</tr>
<tr>
<td>1990</td>
<td>77.6</td>
<td>21.3</td>
</tr>
<tr>
<td>2000</td>
<td>84.1</td>
<td>25.6</td>
</tr>
<tr>
<td>2010</td>
<td>87.1</td>
<td>29.9</td>
</tr>
</tbody>
</table>

Source: USDE, Institute of Education Sciences, National Center for Education Statistics (2010).

Notes: 1 Estimates based on Census Bureau reverse projection of 1940 census data on education by age.

2 Data for years prior to 1993 are for persons with 4 or more years of high school. Data for later years are for high school completers.

3 Data for years prior to 1993 are for persons with 4 or more years of college.
The role of education in human and social capital contributed to the rising importance of education in national society (e.g., Goldin and Katz, 1999). Changing occupational structures prior to WWII played a role in growing primary and secondary educational attainment. Specifically,

\[\text{structural arrangements and interaction patterns that foster positive relationships are regarded as social capital and are conceptualized as investments that can yield human capital returns in terms of higher education attainment (Smith, et al., 1995: 363).}\]

After WWII, federal measures—such as the G.I. Bill of Rights—and demographic factors—such as the baby boom—contributed to marked enrollment increases at IHE. In the decades following WWII, government investment in education at all levels benefitted individuals and places by advancing knowledge, raising skill levels, and, thereby, increasing physical, human, and social capital. Therefore, education provides a "crucial" link to the state through its function of socialization, connection to economic development, and association with research and technology growth (Hall, 1981: 4). The next sections of this Chapter focus on the key players in higher education’s connection to the state: “the federal and state governments, who underwrite much of higher education...” (Klor de Alva and Schneider, 2011: 4).

3.3. The federal context

The U.S. federal government exerts minimal control over the operation and maintenance of educational institutions at all levels.\(^3\) Since the late 1700s, federal action

\(^3\) The seven military service academies—the U.S. Air Force Academy (Colorado), Army Command and General Staff College (Kansas), Coast Guard Academy (Connecticut), Merchant Marine Academy (New York), Military Academy (New York), Naval Academy (Maryland), and Sports Academy (Alabama)—are the only U.S. IHE which receive the majority of their funding from federal sources.
has shaped higher education in four areas: land allocations for schools, tax exemptions for IHE, research and development (hereafter, R&D), and funding to students. Land allocation and tax exemptions are addressed briefly, while federal R&D spending and federal aid to students are explored in more detail below.

3.3.1. Federal land allocation

Federal land allocation began with Land Ordinance of 1785, which set aside land for public schools in each newly created township (Hyman, 1986; Library of Congress, 2013). Land allocations continued with the Northwest Ordinance of 1787, which encouraged the promotion of education and granted land for townships to establish public schools (The Carnegie Council on Policy Studies in Higher Education, 1975; Hyman, 1986) and state IHE (Stewart, 1949). The Morrill Acts\(^4\) of 1862 and 1890 enabled states to set aside land—based on state populations at the time—to establish IHE (see Chapter 4, Section 4.3.1.). The motivation behind the passage of the Morrill Acts reflected changes in occupational structures and educational demands in U.S. society. The so-called land-grant IHE aimed to prepare students for practical learning and professional training in the agricultural and mechanical fields. The Equity in Educational Land-Grant Status Act of 1994 later approved land-grant status to 29 Native American IHE (Ingram, 2012). As of 2007, there were 103 land-grant IHE under the 1862, 1890, and 1994 acts (U.S. Department of Agriculture, 2009).

\(^4\) The legislation was formally entitled, *An Act donating Public Lands to the several States and Territories which may provide Colleges for the Benefit of Agriculture and the Mechanic Arts* (Hyman, 1986). The Act commonly is referred to as the Morrill Land-Grant Act, the Land-Grant Act, or the Morrill Act in literatures.
3.3.2. Federal tax exemptions

Tax-free status for IHE is granted under Internal Revenue Code Section 501(c)(3), which grants exempt status to organizations involved in the “advancement of education or science” (Internal Revenue Service, 2013: no page number). Private, non-profit IHE are granted tax-free status under this directive, while public IHE are tax-free based on their educational purposes and/or their state-government purposes (Association of American Universities, 2013). Taxpayers receive the benefit of college graduates’ higher wages, yet taxpayers invest “substantial amounts of money in colleges and universities to gain those benefits—and these investments are skewed toward more elite schools” (Klor de Alva and Schneider, 2011: 17-18). For each bachelor’s degree that is granted at a private, non-profit IHE, the cost to taxpayers is approximately $8,000 (Klor de Alva and Schneider, 2011). Conversely, for each bachelor’s degree conferred from a private, for-profit institution, the gain to taxpayers is approximately $6,000 (Klor de Alva and Schneider, 2011). The private, for-profit sector is a growing part of U.S. higher education (see Chapter 4, Section 4.4.5.). However, there were nearly three times more students enrolled in private, non-profit IHE than in private, for-profit IHE in 2007. Thus, the cost to taxpayers for federal tax exemptions for private, non-profit IHE exceeds the benefit of taxes received for private, for-profit IHE. In addition to the federal government granting tax exemptions for IHE, the federal government also grants tax exemptions for students.

3.3.3. Federal R&D spending

Service-sector activities associated with IHE include both consumer (see Section 3.2.) and producer (e.g., research, technology transfer, and consulting) services. Consumer services are instrumental in attracting students to IHE and, therefore, are crucial to the
overall success of IHE. However, the R&D functions of IHE—particularly for those institutions with strong R&D linkages in the sciences, engineering, or computing (see Chapter 4, Section 4.4.4.)—have been increasingly identified as being important stimuli of local and regional economic development (see Chapter 1, Section 1.3.). Literatures about the geopolitics of research funding reinforce the linkages between IHE and economic development by concluding that strong research universities are “seen as a first step in bringing development to a region, and allowing new entrants to participate in front-line R&D” (Higgins, 1991: 507). This section provides an overview both of federal R&D spending and federal R&D allocations to IHE.

The federal government funds R&D in order to advance basic research. Total federal R&D spending rose dramatically from 1955 (14.3 billion constant 2012 dollars) to 2010 (141.7 billion constant 2012 dollars) (American Association for the Advancement of Science, 2013b) (Table 3.2.). Non-defense R&D increased dramatically after the Soviet Union’s 1957 launch of Sputnik. For instance, space-related R&D grew from 31 million dollars in 1955 to 2 billion dollars in 1960 and to 26 billion dollars in 1965 (American Association for the Advancement of Science, 2013c). Space-related R&D comprised the majority of non-defense R&D until the mid-1980s, when health-related R&D surpassed space-related R&D for the majority of non-defense R&D (American Association for the Advancement of Science, 2013c). Since the mid-1980s, defense-related R&D has accounted for the majority of R&D spending (American Association for the Advancement of Science, 2013a and 2013c). Defense-related R&D accounted for more than 57 percent of all R&D in 2010, while non-defense R&D (i.e., health, space, energy, science, etc.) accounted for approximately 42 percent of R&D (American Association for the Advancement of Science, 2013c).
### Table 3.2: Federal R&D funding by performer, 1955-2010

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Total Federal R&amp;D</th>
<th>Intramural</th>
<th>Industry</th>
<th>Universities/Colleges</th>
<th>FFRDCs</th>
<th>All Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>1955</td>
<td>14,308</td>
<td>46.5</td>
<td>31.1</td>
<td>6.8</td>
<td>14.1</td>
<td>1.4</td>
</tr>
<tr>
<td>1960</td>
<td>46,923</td>
<td>22.8</td>
<td>57.7</td>
<td>6.1</td>
<td>10.9</td>
<td>2.5</td>
</tr>
<tr>
<td>1965</td>
<td>84,928</td>
<td>21.2</td>
<td>59.2</td>
<td>8.2</td>
<td>8.3</td>
<td>3.2</td>
</tr>
<tr>
<td>1970</td>
<td>74,116</td>
<td>26.6</td>
<td>50.7</td>
<td>9.6</td>
<td>9.3</td>
<td>3.8</td>
</tr>
<tr>
<td>1975</td>
<td>67,682</td>
<td>28.1</td>
<td>44.2</td>
<td>12.7</td>
<td>9.8</td>
<td>5.2</td>
</tr>
<tr>
<td>1980</td>
<td>73,338</td>
<td>25.6</td>
<td>43.5</td>
<td>14.3</td>
<td>11.3</td>
<td>5.3</td>
</tr>
<tr>
<td>1985</td>
<td>90,631</td>
<td>26.8</td>
<td>44.9</td>
<td>13.1</td>
<td>11.0</td>
<td>4.3</td>
</tr>
<tr>
<td>1990</td>
<td>102,016</td>
<td>24.9</td>
<td>46.2</td>
<td>14.4</td>
<td>10.1</td>
<td>4.4</td>
</tr>
<tr>
<td>1995</td>
<td>96,427</td>
<td>25.0</td>
<td>44.3</td>
<td>17.5</td>
<td>8.2</td>
<td>5.0</td>
</tr>
<tr>
<td>2000</td>
<td>98,819</td>
<td>24.1</td>
<td>38.7</td>
<td>22.3</td>
<td>8.6</td>
<td>6.3</td>
</tr>
<tr>
<td>2005</td>
<td>137,650</td>
<td>21.8</td>
<td>41.1</td>
<td>21.6</td>
<td>8.7</td>
<td>6.8</td>
</tr>
<tr>
<td>2010</td>
<td>141,686</td>
<td>23.7</td>
<td>39.7</td>
<td>22.9</td>
<td>7.7</td>
<td>6.1</td>
</tr>
</tbody>
</table>

Source: National Science Foundation data (American Association for the Advancement of Science, 2013b).

Notes:
1. Total R&D is in millions of constant FY 2012 dollars.
2. Intramural R&D refers to research conducted at the federal level.
3. FFRDCs refers to Federally Funded Research and Development Centers, which are government-owned contractor-operated laboratories.

Just as federal R&D funding grew between 1955 and 2010, so too did the proportion of federal R&D funding for IHE increase as well. Prior to WWII, the federal government was not the leader in funding academic research. After WWII, federal spending on defense and other research areas was seen as an investment in human capital and national security. Most notably, the National Science Foundation was established in 1950 to promote non-medical research funding (Gumport, 1990; Cowley and Williams, 1991). Federal R&D
funding to IHE rose from 6.8 percent of all federal R&D in 1955 to 22.9 percent of all federal R&D in 2010 (see Table 3.2.). The 1960s expansion of doctoral programs in the U.S. was an important part of the growth of academic R&D after WWII (Gumport, 1990) (see Chapter 4, Section 4.4.4.).

The federal government historically has funded the majority of R&D at IHE (National Science Board, 2012). Moreover, it has been estimated that IHE have conducted more than half of the nation’s basic research since the late 1990s (c.f., Rothblatt, 1997; National Science Board, 2012). Academic R&D from non-federal sources comes from IHE, state and local governments, industry, or other sources (National Science Board, 2012). Public IHE tend to rely on non-federal sources of R&D (46 percent non-federal) more than their private counterparts (29 percent non-federal) (National Science Board, 2012). While federal R&D funding to IHE played an important role in IHE, federal funding to students was pivotal in shaping higher education as well.

3.3.4. Federal aid to students

Federal funding to students emerged in the 1900s. The Vocational Rehabilitation Act of 1918 provided World War I veterans with vocational training (USDE, 2000). During the 1930s, notions of the "American way of life" and the "American ideal" emerged as symbolic ideas uniting persons of diverse origins, politics, and backgrounds amid poor economic conditions (e.g., Lears, 1989; Wall, 1998). Concurrently, growing concerns over the costs of higher education accompanied the Great Depression (Coffman, 1934). To assist students during the Depression, the National Youth Administration (NYA) gave students funding to attend IHE between 1935 and 1943. Brubacher and Rudy (1958: 228) contend that the
NYA’s financial support “was motivated more by temporary economic considerations than by any purposeful plan to give federal aid to college students.” Regardless of the NYA’s motivations, the NYA’s actions set a precedent for the federal funding of students in IHE.

As the U.S. faced an extended economic depression, the linkages between the federal government, the states, and higher education became increasingly apparent; there was a growing dialogue about the impact of unequal educational opportunities upon the nation’s economy (Educational Policies Commission, 1940). President Franklin Delano Roosevelt began considering the role of education in post-WWI demobilization in 1940, when he signed the Selective Training and Service Act, which was the first peacetime military draft. Once the U.S. entered WWII in 1941, lingering fears of a post-War recession concerned soldiers, civilians, and policymakers alike. The demobilization of nearly 16 million veterans prompted the drafting and enactment of the single largest federal intervention in U.S. higher education—the WWII G.I. Bill of Rights (i.e., Public Law 346).\(^5\) While the G.I. Bill was by no means the first, or will be the last, federal measure affecting U.S. higher education, the pervasiveness of the Bill had lasting impacts for IHE in the United States. The discussion herein focuses on the roles of the G.I. Bills (Section 3.3.3.1.) and federal grant and loan programs (Section 3.3.3.2.) in funding students.

3.3.4.1. The G.I. Bill

The return of nearly 16 million veterans to the U.S. following WWII was expected to be an adjustment on many levels, including the home, the community, the state, and the nation

\(^5\) For the specifics of the Congressional debate and lineage of the final version of the G.I. Bill, see Ross (1969).
(Cartwright, 1944). The 1944 G.I. Bill of Rights was a demobilization policy designed to ease veterans' transition to civilian life, yet the pervasiveness of the Bill accomplished much more. Federal funding for veterans under the G.I. Bill gave rise to marked increases in home ownership, small business start-ups, and higher education enrollments. The scale and scope of the Bill was driven both by changes in the economy and by concerns that the end of WWII would prompt another economic depression.

During the Depression, it became evident that the unemployment of many men was not entirely due to lack of job opportunities or to their age, but primarily due to lack of vocational training and experience in useful productive skills. This appeared to be particularly true of veterans of the last war [World War I] who had drifted into civilian life, and continued drifting occupationally until economic conditions prevented unemployment of unskilled workers. Veterans returned to civilian life with economically valuable skills would constitute a substantial national asset (Committee on Education, 1944: 3).

The logic underlying the educational component of the G.I. Bill (i.e., Title II of Public Law 346) was based in a growing realization of the linkages between advanced education and strong economic growth (e.g., Ballard, 1983; Severo and Milford, 1989; Bennett, 1996) (see Section 3.2.).

The educational component of the G.I. Bill provided federal aid for WWII veterans to pursue training either in higher education, vocational education (i.e., less-than-two-year

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6 The G.I. Bill is a dissertation topic in and of itself (e.g., Mosch, 1970; Chapman, 1983; Hylander, 1985; Frydl, 2000; Lieb, 2001). For comprehensive inquiries into the G.I. Bill, see also Waller (1944), Levitan and Zickler (1973), Bennett (1996), Gambone (2005), MacLean (2005), Humes (2006), and Semrow (2004).

7 Veterans compensation did not begin with the 1944 G.I. Bill of Rights, nor did it end there. Veterans' compensation programs in the U.S. have included post-service pensions, compensation for disabled veterans, recompense for dependents, and re-education and training programs. The G.I. Bill is just one example of social legislation outlining the federal government’s obligation to those who have served the country militarily. For a review of the history of military benefits in the U.S., see Waller (1944), Wecter (1944), Severo and Milford (1989), and Skocpol (1992).
IHE or schools below college-level), job training, or on-farm training. Veterans were eligible to receive education or training for a period of one to four years, depending on the veteran’s length of active service in the military (see Patman, 1945, for the full stipulations of the G.I. Bill). The G.I. Bill covered full-time enrollment in IHE (i.e., tuition and fees), monthly subsistence allowances, and fees for supplies (i.e., books) (Patman, 1945). Since “three out of every five men in the service did not graduate from high school” (Brown, 1946: 41), accommodations were made to admit veterans to IHE based on veterans establishing an “ability to do college work” (Brown, 1946: 59).

While it was clear that the G.I. Bill would have some impact on IHE, the magnitude of that impact was unclear. Amid early discussions of educational funding for WWII veterans, there were marked discrepancies in the estimates of the number of veterans who would use G.I. Bill funds to attend IHE. The Osborn Committee approximated that “ten percent of those in the Armed Forces, or roughly one million veterans, will take advantage of the education and training opportunities” (Committee on Education, 1944: 3-4). The estimate of 10 percent of returning WWII veterans using G.I. Bill funds to attend IHE has been repeated elsewhere (c.f., Goodykoontz, 1945).

8 Offering entrance to IHE for those veterans who had not completed high school was considered prior to the enactment of the G.I. Bill, as long as it was understood that such measures would be temporary and that the circumstances surrounding them would be extenuating (Brumbaugh, 1943).

9 It was particularly difficult to gauge the extent to which veterans would enroll in IHE using G.I. Bill funds for two reasons. Firstly, higher education was financially inaccessible for many individuals prior to the enactment of the G.I. Bill. The economic hardship of the Great Depression exacerbated the financial disparities between those students who could and could not afford to attend IHE. Secondly, many of the veterans utilizing G.I. Bill funds to attend IHE were first-generation students. Based on the combination of these factors, many assumed that the vast majority of veterans would prefer vocational training over higher education (e.g., Committee on Education, 1944; Goodykoontz, 1945). Recent studies indicate that only 20 percent of the veterans who graduated from IHE would have been able to achieve a higher education without the G.I. Bill (Haydock, 1999).
others’ assumptions about veteran use of the G.I. Bill, Floyd Reeves, who chaired the National Resources Planning Board, anticipated a much greater initial demand.

The colleges and universities are going to have to prepare to assume a tremendous load in the first two or three years following the beginning of demobilization. There may be as many as two or three million veterans and war workers who will want to enter higher institutions (Reeves, 1943: 56).

Reeves’ approximation proved to be more accurate. It has been estimated that nearly 2.2 million veterans—roughly one-third of all veterans returning from WWII—entered U.S. IHE under the G.I. Bill (Rudolph, 1962; Kiester, 1994; Greenberg, 2004).

In a relatively short period of time, it became clear that veterans returning to the U.S. and using G.I. Bill benefits to attend IHE would have a dramatic impact on higher education. More than 87,000 veterans had enrolled in IHE using the G.I. Bill by November 1945; more than 1 million veterans were enrolled by November 1946 (Table 3.3.).

By late Spring of 1946 it was apparent that colleges and universities faced problems of such magnitude and of such seriousness that they constituted a critical situation in higher education. It was apparent too that these problems could be solved only by ever closer cooperation between government and the institutions and organizations of higher education (Zook, 1946: iii).

The challenge facing higher education in 1946 was to accommodate veterans in the approximately 2,300 existing and accredited IHE in response to the growing demand for higher education services. This challenge was not a minor hurdle. In order to satisfy the new demand for higher education fueled by the WWII G.I. Bill, existing IHE expanded their enrollments, and nearly 560 new IHE were founded between 1947 and 1960, when the last of the WWII veterans completed their training.
### Table 3.3: Participation in the WWII G.I. Bill, 1945-1960

<table>
<thead>
<tr>
<th>Date</th>
<th>Veterans Entered Training</th>
<th>Total Veterans in Training</th>
<th>Number</th>
<th>Percent</th>
<th>In Schools Below College-Level</th>
<th>In Job Training</th>
<th>In on-Farm Training</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/30/1945</td>
<td>181,211</td>
<td>155,158</td>
<td>87,805</td>
<td>56.6</td>
<td>21.1</td>
<td>17.1</td>
<td>5.2</td>
</tr>
<tr>
<td>11/30/1946</td>
<td>2,290,040</td>
<td>2,080,440</td>
<td>1,012,700</td>
<td>48.7</td>
<td>18.1</td>
<td>29.6</td>
<td>3.7</td>
</tr>
<tr>
<td>11/30/1947</td>
<td>4,461,648</td>
<td>2,546,163</td>
<td>1,149,941</td>
<td>45.2</td>
<td>25.6</td>
<td>21.4</td>
<td>7.8</td>
</tr>
<tr>
<td>11/30/1948</td>
<td>5,606,038</td>
<td>2,302,120</td>
<td>974,945</td>
<td>42.3</td>
<td>28.9</td>
<td>17.1</td>
<td>11.6</td>
</tr>
<tr>
<td>11/30/1949</td>
<td>6,552,498</td>
<td>2,288,083</td>
<td>843,677</td>
<td>36.9</td>
<td>37.7</td>
<td>12.1</td>
<td>13.4</td>
</tr>
<tr>
<td>11/30/1950</td>
<td>7,249,524</td>
<td>1,759,021</td>
<td>580,597</td>
<td>33.0</td>
<td>41.6</td>
<td>8.8</td>
<td>16.6</td>
</tr>
<tr>
<td>11/30/1951</td>
<td>7,775,592</td>
<td>1,486,272</td>
<td>396,186</td>
<td>26.7</td>
<td>49.7</td>
<td>6.9</td>
<td>16.8</td>
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<tr>
<td>11/30/1952</td>
<td>7,802,044</td>
<td>719,589</td>
<td>231,708</td>
<td>32.2</td>
<td>43.6</td>
<td>6.2</td>
<td>18.0</td>
</tr>
<tr>
<td>11/30/1953</td>
<td>7,809,691</td>
<td>356,037</td>
<td>138,131</td>
<td>38.8</td>
<td>41.0</td>
<td>4.2</td>
<td>16.0</td>
</tr>
<tr>
<td>11/30/1954</td>
<td>7,813,219</td>
<td>180,518</td>
<td>78,491</td>
<td>43.5</td>
<td>44.1</td>
<td>2.1</td>
<td>10.3</td>
</tr>
<tr>
<td>11/30/1955</td>
<td>7,814,562</td>
<td>87,768</td>
<td>41,987</td>
<td>47.8</td>
<td>50.4</td>
<td>0.5</td>
<td>1.3</td>
</tr>
<tr>
<td>11/30/1956</td>
<td>7,800,000 3</td>
<td>1,869</td>
<td>1,169</td>
<td>62.5</td>
<td>28.0</td>
<td>3.9</td>
<td>5.5</td>
</tr>
<tr>
<td>11/30/1957</td>
<td>7,800,000 3</td>
<td>625</td>
<td>406</td>
<td>65.0</td>
<td>31.2</td>
<td>1.0</td>
<td>2.9</td>
</tr>
<tr>
<td>11/30/1958</td>
<td>7,800,000 3</td>
<td>156</td>
<td>88</td>
<td>56.4</td>
<td>40.4</td>
<td>0.0</td>
<td>3.2</td>
</tr>
<tr>
<td>11/30/1959</td>
<td>7,800,000 3</td>
<td>34</td>
<td>26</td>
<td>76.5</td>
<td>20.6</td>
<td>0.0</td>
<td>2.9</td>
</tr>
<tr>
<td>6/30/1960</td>
<td>7,800,000 3</td>
<td>9</td>
<td>6</td>
<td>66.7</td>
<td>33.3</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>


Notes: 
1 Cumulative from enactment of Public Law 346, June 1944.
2 Funding for Public Law 346 formally ended on July 25, 1956. A small number of veterans remained in training after that date.
3 Figure is rounded.
Later iterations of the G.I. Bill continued to broaden access to higher education for veterans, albeit at lower funding levels and shorter funding durations. In August 1952, Public Law 550 was enacted to assist Korean War veterans in demobilization and rehabilitation.

The Korean GI Bill made several changes, however, in education benefits, reducing financial benefits generally and imposing new restrictions. In contrast to the 48 months of education allowed by the 1944 law, the Korean GI Bill permitted a maximum of 36 months. The Korean GI Bill also did not provide tuition payments to the colleges. Instead, veterans were paid subsistence checks, which were also to cover their college expenses. The effect of the changes was that the benefit no longer completely covered the cost of the veteran’s education (U.S. Department of Veterans Affairs, 2006: 16).

Although the total numbers of Korean War veterans were lower than the numbers of WWII veterans, Korean War veterans used their funds to attend IHE in higher proportions than their WWII counterparts (Table 3.4.). In total, nearly 51 percent of Korean War veterans using the G.I. Bill for training entered IHE, compared to nearly 29 percent of WWII veterans (Educational Testing Service, 1973). The peak of Korean War veteran enrollment in IHE was in 1956, when more than 473,000 veterans were enrolled (U.S. Veterans Administration, 1965).

Ten years later, the Vietnam-era Veterans’ Readjustment Benefits Act (i.e., Public Law 358) was signed by Lyndon B. Johnson on March 3, 1966.

Well, I must be frank. I had felt that we could start the new GI program, and that we should, by providing special funds for soldiers who served in combat areas. Others could be provided opportunity grants through the Higher Education Act. In that way, I was hopeful that we would not ask for more than we could get, or bite off more than we could chew in educational costs (Johnson, 1966).
Table 3.4.: Comparison of participation rates for the G.I. Bills

<table>
<thead>
<tr>
<th></th>
<th>World War II</th>
<th>Korean War</th>
<th>Vietnam Era</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>June 1944-</td>
<td>September</td>
</tr>
<tr>
<td></td>
<td></td>
<td>April 1951</td>
<td>1952-July</td>
</tr>
<tr>
<td>Veteran population</td>
<td>15,440,000</td>
<td>5,443,000</td>
<td>6,476,000</td>
</tr>
<tr>
<td>Total veteran</td>
<td>7,451,971</td>
<td>2,280,412</td>
<td>2,647,993</td>
</tr>
<tr>
<td>population trained</td>
<td></td>
<td>48.3</td>
<td>41.9</td>
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<tr>
<td>Percent trained</td>
<td>48.3</td>
<td>41.9</td>
<td>40.9</td>
</tr>
<tr>
<td>Percent in college</td>
<td>14.0</td>
<td>21.2</td>
<td>23.2</td>
</tr>
<tr>
<td>Percent below college</td>
<td>21.1</td>
<td>15.0</td>
<td>13.4</td>
</tr>
<tr>
<td>Percent on-job</td>
<td>9.1</td>
<td>4.0</td>
<td>4.2</td>
</tr>
<tr>
<td>training</td>
<td>9.1</td>
<td>4.0</td>
<td>4.2</td>
</tr>
<tr>
<td>Percent on-farm</td>
<td>4.1</td>
<td>1.7</td>
<td>0.1</td>
</tr>
<tr>
<td>training</td>
<td>4.1</td>
<td>1.7</td>
<td>0.1</td>
</tr>
<tr>
<td>Total veterans in</td>
<td>2,155,988</td>
<td>1,153,448</td>
<td>1,505,248</td>
</tr>
<tr>
<td>college</td>
<td></td>
<td>28.9</td>
<td>50.6</td>
</tr>
<tr>
<td>Percent of trained</td>
<td></td>
<td>28.9</td>
<td>50.6</td>
</tr>
<tr>
<td>veterans in college</td>
<td></td>
<td></td>
<td>56.8</td>
</tr>
</tbody>
</table>

Note: The table details comparisons of the G.I. Bills after the first 83 months of enactment.

By 1973, more than 1.5 million Vietnam veterans—nearly 57 percent of Vietnam veterans who entered training—had enrolled in college (Educational Testing Service, 1973). “By 1980, the Veterans’ Readjustment Benefits Act of 1966 had trained 5.5 million veterans.” (U.S. Department of Veterans Affairs, 2006: 18). Educational funding for veterans serving after the Vietnam War include the:

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10 The U.S. Veterans Administration did not publish their Annual report of the Administrator of Veterans’ Affairs during the Vietnam War. Annual data on Vietnam-era veterans’ use of the G.I. Bill are lacking, and comparative data are difficult to locate.
• Reserve Educational Assistance (REAP) and Veterans Educational Assistance Program (VEAP) of 1977,
• Persian Gulf Conflict Supplemental Authorization and Personnel Benefits Act of 1991, and

Later iterations of the G.I. Bills enabled veterans, reservists, and their dependents to attend IHE at reduced cost. The Post-9/11 G.I. Bill, for example, capped private IHE tuition reimbursement at a maximum level per year (U.S. Department of Veterans Affairs, 2012).

In summary, the WWII G.I. Bill provided the impetus for the expansion of higher education enrollments and institutions in the immediate post-WWII era and into the 1950s. The Bill sought to expand educational opportunities and, thus, the future employability of veterans as a means of averting an economic downturn as a result of demobilization. By expanding access to higher education for veterans of WWII, the G.I. Bill also had a profound and lasting impact on who attended and benefitted from IHE.

By granting a paid education to every qualified veteran, the bill transformed America's colleges and universities, cranked out a huge pool of trained professionals, changed the educational goals of the nation and fueled a giddy postwar boom. Suddenly a college degree was within the reach of millions—and remained that way (Kiester, 1994: 130).

Thus, the G.I. Bill symbolized a new era for U.S. higher education—an era in which access to a higher education was broadened. As the 1950s and 1960s continued, the Korean and Vietnam G.I. Bills continued to make a higher education financially accessible to veterans returning from war. Access to a higher education was expanded further by an increasing diversity of institutional types after 1960 (see Part II of the dissertation) and the rise of federal grant and loan programs.
3.3.4.2. Federal grant and loan programs

After the enactment of the G.I. Bill, the federal role in U.S. society as a whole grew considerably (Caplow, et al., 1991). Many of the policies drafted after WWII (i.e., the Full Employment Act of 1946, the National Housing Act of 1954) reinforced the idea that the federal government was responsible for general and economic welfare (Susman with Griffin, 1989). The strong linkages between education, economic well-being, and democracy paved the way for the enactment of significant legislation providing higher education financial aid to civilian students. The National Defense Education Act (NDEA) and the Higher Education Act (HEA) are examined herein.

The NDEA of 1958 was a Cold War response to the Soviet Union's launch of Sputnik. The NDEA aimed to advance training in science and technical fields at the collegiate level, including offering low-interest loans and graduate fellowships for students (USDE, 2013). The NDEA established that "no student of ability will be denied an opportunity for higher education because of financial need" (U.S. Congress, 1958: 1581). The NDEA also provided "debt cancellation" of loans for students entering the teaching profession after graduation (Gladieux, 1995: 2). The NDEA loans were re-named the Perkins Loans after Kentucky Representative Carl D. Perkins in 1986 (FinAid, 2013).

The HEA of 1965 extended the federal role in civilian education by enhancing teacher quality, offering institutional aid, and providing student assistance (U.S. Congress, 2013). The HEA aimed "[t]o strengthen the educational resources of our colleges and universities and to provide financial assistance for students in postsecondary and higher education" (Higher Education Resource Hub, 2006: 1). Title IV of the HEA in 1965 established federal "Educational Opportunity Grants" for low-income students (National Council of Higher Education Resources, 2012: 14), the College Work-Study program, and the Guaranteed
Student Loans (GSL) program, which was re-named the Stafford Loan program after Vermont Senator Robert Stafford in 1988 (Associated Press, 2006).

Since 1965, the HEA has been re-authorized and amended\textsuperscript{11} numerous times. The 1972 amendments\textsuperscript{12} to the HEA offered what some have called a “‘civilian’ GI Bill of Rights” (Kerr, 1994: 4). The 1972 HEA Title IV amendments re-classified the Educational Opportunity Grants as “Basic Educational Opportunity Grants” (BEOG), which were later re-named after Rhode Island Senator Claiborne Pell in 1980 (USDE, 2011: no page number). The 1972 legislation utilized the term “‘postsecondary education’” (Gladieux, 1995: 3), which expanded the use of federal funds to two-year, part-time, and vocational students. In addition, private, for-profit IHE were granted eligibility to participate in Title IV programs (Gladieux, 1995).

Whereas Pell Grants provide financial aid which does not need to be re-paid, “GSLs provide subsidized loans that must be repaid but that frequently are not repaid” (Hanushek, 1989: 49). The 1992 re-authorization of the HEA eliminated a cap for the Parent PLUS Loan program and established a loan option for students irrespective of financial need (Gladieux, 1995). In addition, the Federal Direct Loan Demonstration Program—which later became the Federal Direct Student Loan Program (FDLP) and then the William D. Ford Direct Loan Program—was authorized by the HEA amendments in 1992 (USDE, 2002). Beginning in 1992, the GSL program was re-named the Federal Family Education Loan

\textsuperscript{11} The initial HEA 1965 legislation was 55 pages (National Council of Higher Education Resources, 2012); in 2008, the legislation was 1,158 pages (Field, 2013). An analysis of the thousands of sections of regulation in Title IV of the HEA revealed that the regulations’ “collective weight is immense” for IHE (Merisotis, 1994: no page number).

\textsuperscript{12} The 1972 HEA included Title IX legislation, which prohibited discrimination by sex in federally-funded IHE (see Section 3.5.3.2.).
(FFEL) program; Stafford Loans and PLUS Loans fell under this program until 2010, when FFEL was eliminated and the Direct Loan Program became the primary federal loan program (USDE, 2002; FinAid, 2013).

In 1965, approximately 172.8 million federal dollars were awarded to students, primarily in the form of Perkins Loans (Table 3.5). After the HEA was enacted, Stafford Loans (later known as GSL and FFEL) began to comprise the majority of student aid. In 1970 alone, the FFEL Program aid accounted for more than 4.5 billion dollars. By 1990, FFEL aid had more than tripled to nearly 18.7 billion dollars. After the Direct Loan Program was instituted in 1994, total federal aid to students increased from 19.3 billion dollars in 1990 to 35.7 billion dollars in 1995. The mis-use of FFEL funds by private, for-profit IHE during the 1990s has been documented (Gladieux, 1995; McCluskey and Edwards, 2009). Overall, there has been a growing emphasis on federal student loans (c.f., Skocpol and Mettler, 2008). Kerr (1994) reported that approximately 30 percent of students received some form of federal support (e.g., federal loans or grants) to attend IHE in the early-1990s. By the 2003-2004 academic year, nearly half (48 percent) of all undergraduates received federal loans to attend IHE (USDE, Institute of Education Sciences, National Center for Education Statistics, 2007). Total federal aid to students was projected to be more than $110 billion dollars in 2010.
Table 3.5: Funds to higher education generated by federal legislation, 1965-2012  
(In millions of constant 2012 dollars\(^1\))

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>Direct Loan Program(^3)</th>
<th>FFEL Program(^4)</th>
<th>Perkins Loans(^5)</th>
<th>Leaning Educational Assistance Partnerships(^6)</th>
<th>Supplemental Educational Opportunity Grants(^7)</th>
<th>Work-Study Aid(^8)</th>
<th>Estimated federal tax expenditures for education(^9)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1965</td>
<td>$172.8</td>
<td>†</td>
<td>†</td>
<td>†</td>
<td>†</td>
<td>†</td>
<td>†</td>
<td>$55.4</td>
</tr>
<tr>
<td>1970</td>
<td>4,938.2</td>
<td>†</td>
<td>$4,567.0</td>
<td>124.4</td>
<td>†</td>
<td>†</td>
<td>†</td>
<td>246.7</td>
</tr>
<tr>
<td>1975</td>
<td>5,737.3</td>
<td>†</td>
<td>5,040.9</td>
<td>145.8</td>
<td>$81.8</td>
<td>†</td>
<td>468.9</td>
<td>$35,179.3</td>
</tr>
<tr>
<td>1980</td>
<td>13,284.0</td>
<td>†</td>
<td>12,578.2</td>
<td>26.9</td>
<td>210.1</td>
<td>†</td>
<td>408.7</td>
<td>36,438.0</td>
</tr>
<tr>
<td>1985</td>
<td>17,562.5</td>
<td>†</td>
<td>17,042.2</td>
<td>43.0</td>
<td>153.0</td>
<td>†</td>
<td>324.3</td>
<td>38,454.1</td>
</tr>
<tr>
<td>1990</td>
<td>19,318.4</td>
<td>†</td>
<td>18,694.7</td>
<td>25.9</td>
<td>102.2</td>
<td>84.3</td>
<td>410.5</td>
<td>32,878.9</td>
</tr>
<tr>
<td>1995</td>
<td>35,726.2</td>
<td>7,626.9</td>
<td>27,567.4</td>
<td>77.8</td>
<td>93.7</td>
<td>272.8</td>
<td>281.6</td>
<td>36,553.8</td>
</tr>
<tr>
<td>2000</td>
<td>45,262.6</td>
<td>13,939.5</td>
<td>30,964.4</td>
<td>44.9</td>
<td>67.4</td>
<td>269.0</td>
<td>345.4</td>
<td>53,181.0</td>
</tr>
<tr>
<td>2005</td>
<td>67,143.5</td>
<td>15,276.8</td>
<td>51,140.0</td>
<td>0.0</td>
<td>119.1</td>
<td>290.6</td>
<td>316.6</td>
<td>—</td>
</tr>
<tr>
<td>2010(^*)</td>
<td>110,387.8</td>
<td>89,210.7</td>
<td>20,662.0</td>
<td>0.0</td>
<td>103.2</td>
<td>211.7</td>
<td>200.1</td>
<td>—</td>
</tr>
</tbody>
</table>

\(†\) Not applicable.

--- Not available.

Source: USDE, NCES (2012).

Notes:  
\(^1\) Data adjusted by the federal funds composite deflator reported in the U.S. Office of Management and Budget, Fiscal Year 2013.

\(^2\) Losses of tax revenue due to provisions of the federal income tax laws which allow for special exclusions, exemptions, or deduction from gross income or provide a special credit, preferential rate of tax, or a deferral of tax liability affecting individual or corporate income tax liabilities.

\(^3\) The William D. Ford Direct Loan Program (i.e., the Direct Loan Program) provides students with the same benefits they were eligible to receive under the Federal Family Education Loan (FFEL) Program.

\(^4\) The FFEL Program provided student loans guaranteed by the federal government and disbursed to borrowers. After June 30, 2010, no new FFEL loans were originated; all new loans are originated through the Direct Loan Program.

\(^5\) Student loans created from institutional matching funds (since 1993 one-third of federal capital contributions).

\(^6\) Formerly the State Student Incentive Grant Program.

\(^7\) Institutions award grants to undergraduate students, and the federal share of such grants may not exceed 75 percent of the total grant.

\(^8\) Employer contributions to student earnings are generally one-third of federal allocation.

\(^9\) Estimated
3.4. The state-level context

Key federal and educational factors influenced higher education both historically and after WWII. In order to understand how state-level factors shaped IHE after WWII, it is important to place state-funded (i.e., public) education in a historical context. Public education was slow to develop in the colonies; "[e]ven the idea of education at public expense . . . took much of the Colonial period to gain wide acceptance" (emphasis in original) (Goodykoontz, 1945: 19). After the Revolutionary War, the land set aside for schools within the Land Ordinance of 1785 and the Northwest Ordinance of 1787 (see Section 3.3.1.) paved the way for the so-called common school movement (c.f., Goldin and Katz, 2003). The common school movement was based on the establishment of local taxes to pay for primary schools and on the availability of tuition-free instruction for children. In 1852, Massachusetts became the first state to establish compulsory primary school attendance (Storr, 1965).

While state-supported education developed slowly at the primary and secondary levels in the new nation, a strong relationship between the state and IHE already was forged at this time. Until the Dartmouth College Case of 1819, private, non-profit IHE were funded, in part, by public (i.e., Colonial) sources (see Chapter 4, Section 4.2.). The Dartmouth College Case established that private, non-profit IHE were not subject to control by Colonial legislatures. While the Dartmouth College Case contributed to the relative proliferation of private, non-profit IHE after 1819, it also fostered discussions about the public purpose of IHE. The dialogue about the public role of education—and IHE—in maintaining a strong

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13 Non-white and white children were prohibited from attending public schools together until May 17, 1954, when the Supreme Court ruled in favor of Brown v. the Board of Education (Walters, 1993). For more information on the history and outcomes of Brown v. the Board of Education, see Zirkel and Cantor (2004), U.S. Courts (n.d.), and NAACP Legal Defense and Educational Fund, Inc. (n.d.).
country culminated in the enactment of the Morrill Act in 1862 (see Chapter 4, Section 4.3.1.).

In the early twentieth century, the nation's elementary, secondary, and postsecondary school systems were already decentralized (Goldin and Katz, 2003), because each state controlled its own system of education. In the early twentieth century, higher education was diverse, and contained a wide-ranging, viable private sector and a growing multi-layered public sector. Competition existed both between and within the public and private sectors (Goldin and Katz, 2003: 8).

The scale and scope of higher education grew between 1890 and 1940, as enrollment in public higher education increased (Goldin and Katz, 1998b) (see Chapter 4, Section 4.3.). After WWII, the influx of students to higher education continued, and there was growing competition among IHE for students (see Chapter 6).

States faced similar challenges during this period, yet each state’s response to the growing demand for higher education was shaped by the history of higher education within that state and by the state’s commitment to higher education on a political and policy level. The role of state government policies and politics in shaping higher education after WWII is a complex, well-researched topic (c.f., Hendrickson and Mangum, 1977; Richardson, et al., 1998; Callan, 2002; Davies, 2006). In this dissertation, the role of states in higher education concerns state-level spending on higher education (Section 3.4.1.) and structural models for higher education systems (Section 3.4.2.).

3.4.1. State-level spending on higher education

States allocate funding for higher education in a variety of different ways. The focus herein is on changes over time and variations over space in the composition of state-level
funding for higher education. The components of state-level funding to higher education include:

- state and local appropriations,
- state-supported grant programs,
- state-based loan programs,
- state-based savings plans, and
- state-based college work-study.

State and local appropriations for higher education historically were the primary sources of funding for public higher education. State and local appropriations include state government support for higher education general operating expenses, local tax appropriations, state and local tax revenue, and lottery proceeds (The National Center for Higher Education Management Systems, 2014b). The funds generated from each of these categories varies from state-to-state depending on many factors, including the number of public IHE per state (see Chapter 5, Section 5.2.2.), whether states collect state and/or local taxes (Drenkard, 2011), and whether states participate in a lottery program.

Even though the demand for higher education has been increasing since WWII (see Chapter 6), state investment in higher education has been declining since the early 1980s (Mortenson, 2012). Per capita state and local government support for higher education general operating expenses increased nationally between 1991 and 2010, but there are regional and state-level variations in per capita spending on higher education (Table 3.6.). For example, per capita spending was below the national average for all states in the Northeast region in 1991 and 2000 (The National Center for Higher Education Management Systems, 2014a). In 2010, Connecticut and New York were the only states in the Northeast region with above-average per-capita appropriations. From a historical perspective, the early establishment of private, non-profit IHE within the northeastern states contributed to lower presences by public IHE in these states (see Section 3.4.2. and Chapters 4 and 5).
Table 3.6.: State and local government support for higher education general operating expenses, in per capita dollars, by Census region

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Northeast</td>
<td>119.5</td>
<td>153.8</td>
<td>186.9</td>
<td>28.7</td>
<td>21.5</td>
</tr>
<tr>
<td>Midwest</td>
<td>178.0</td>
<td>224.5</td>
<td>255.1</td>
<td>26.1</td>
<td>13.6</td>
</tr>
<tr>
<td>South</td>
<td>164.4</td>
<td>222.3</td>
<td>271.7</td>
<td>35.2</td>
<td>22.2</td>
</tr>
<tr>
<td>West</td>
<td>204.6</td>
<td>223.0</td>
<td>272.6</td>
<td>9.0</td>
<td>22.2</td>
</tr>
<tr>
<td>Nation</td>
<td>167.0</td>
<td>206.3</td>
<td>238.4</td>
<td>23.5</td>
<td>15.6</td>
</tr>
</tbody>
</table>

Source: Data from The National Center for Higher Education Management Systems (2014a).

Quigley and Rubinfeld (1993) identified and Goldin and Katz (1998a, 1998b, 2001, 2008) elaborated on an inverse relationship between state age and state appropriations; states founded later historically have higher levels of spending on higher education. Thus, per capita state spending on higher education in the traditional core of private, non-profit higher education (i.e., the Northeast) tends to be lower than per capita spending in areas with greater numbers of public IHE (i.e., the West) (c.f., Goldin and Katz, 1998a; Thomas, 2004).

However, the regional patterns are not perfect. Colorado, for example, cut their per capita state and local government support for higher education general operating expenses by nearly one-half between 2000 and 2010. Weerts, et al. (2012) identified attributes associated with higher- and lower-than-expected state appropriations between 1998 and 2009 (Figure 3.1.).
Figure 3.1.: State relationship to predicted levels of appropriations, 1998-2009
Source: Data from Weerts, et al. (2012).
The characteristics Weerts, *et al.* (2012: 7) identified for states with higher-than expected appropriations include:

- economic stability and diversity,
- reliance on educated workers,
- youthful population,
- higher tax rates, and
- historic importance of public higher education.

States possessing lower-than expected rates of appropriations exhibited the opposite characteristics (i.e., unstable economy, older population, spending on state services instead of higher education, history of private, non-profit IHE). Thus, when a multitude of factors are considered, patterns of state spending become more complex (see Chapters 5 and 6).

As state-level appropriations have been declining, the use of state-supported grant programs has been increasing. The three categories of state-supported grant aid include: need-based financial aid, merit-based financial aid, and blended aid. Need-based financial aid originated in the 1960s (Longanecker, 2008), and is supplemented by matching federal funds under the Leveraging Educational Assistance Partnership (LEAP) Program, formerly the State Student Incentive Grant (SSIG) Program (see Section 3.3.4.2.).

In response, most states developed modest financial aid programs to capture the federal funds. A minority of states developed substantial programs, with a number of them balancing this policy move with a greater reliance on tuition revenue. Yet most states continued to rely principally on low tuition as their primary financial affordability tool (Longanecker, 2008: 1).

The different state-level philosophies on tuition revenue, known as high tuition/high aid and low tuition/low aid (Longanecker, 2008; Geiger and Heller, 2011), have a distinct

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14 The LEAP Program “provides grants to states to assist them in providing need-based grants and community service work-study assistance to eligible postsecondary students” (USDE, 2009: no page number). The LEAP Program accounts for a relatively small amount of state-level funding compared to other federally funded grant and loan programs (see Table 3.5.). The LEAP Program now includes Special Leveraging Educational Assistance Partnership (SLEAP) incentive grants for postsecondary students.
regional component. The Northeast and Midwest gravitated toward the former, while the West and South focused on the latter. "Over time, however, all states found it necessary to begin using tuition increases well above inflation as a way of expanding higher education" (Longanecker, 2008: 2). Perna and Titus (2004) found that increases in need-based financial aid increased the likelihood of students enrolling in an in-state, four-year IHE (see Chapter 6).

In contrast to aid available to students demonstrating financial need, merit-based aid is allocated based on academic qualifications. Since the 1990s, there has been an increased reliance on merit-based aid (Weerts, et al., 2012). Nearly one-third of U.S. states were implementing merit-aid programs by 2005 (Doyle, 2006). Whereas states in the South did not generally adopt need-based aid, most states in the South established merit-aid programs (Longanecker, 2008). Georgia's HOPE Scholarship Program (Longanecker, 2008) and Florida's Bright Futures Scholarship Program (Perna and Titus, 2004) are the largest merit-aid programs in the U.S. Doyle (2006) and McLendon, et al. (2005) found a positive correlation between a Republican-controlled legislature and the presence of merit-aid programs. Moreover, states with lower levels of higher education attainment tend to adopt merit-aid programs as a motivation to raise higher education attainment levels (Perna and Titus, 2004; Doyle, 2006; Longanecker, 2008). Some states have adopted a combined approach to student aid called blended aid, which incorporates both need- and merit-based aid. Indiana and Oklahoma are examples of two states using a blended aid model (Longanecker, 2008).

State-based loan programs, state-based savings plans (i.e., the 529), and state-based college work-study are more recent components of state-level higher education allocations. State-based loan programs emerged in the mid-1980s. Minnesota's Student Educational
Loan Fund (SELF) is one example (Longanecker, 2008). State-level college work-study programs are relatively recent, and are present in just fourteen states, with only five states (i.e., Colorado, Minnesota, New Mexico, Pennsylvania, and Washington) implementing a substantial state work-study program (Longanecker, 2008: 4).

Just as states are diversifying their funding for higher education away from state and local appropriations and toward grant and other aid programs, so too there is an increased state-level reliance on institutional revenue (i.e., tuition, fees, services, R&D). Whereas tuition and fees associated with public higher education generate state-level funds, there has been a growing reliance on private (i.e., non-state) sources of funding for public IHE. For example, state governments have encouraged greater collaboration between IHE and industry since the 1980s (Feller, 1992).

The relative mix of public and private revenue sources in public higher education institutions has changed significantly over time—including declines in state appropriations, increases in institutional revenues, and increases in revenue from other private sources, as a proportion of total revenue across all levels of public higher education (Change, 1999: 61).

Changes in revenue sources contribute to the increased privatization of public IHE (Change, 1999; Geiger and Heller, 2011; Mortenson, 2012).

3.4.2. Structural models for higher education systems

While the sources of state funding for higher education have become more diversified, state systems of higher education have become more diversified as well. State variations in higher education are based in historical and spatial contexts (see Section 3.4.1. and Chapter 4). In addition, there are key differences in how states organize and govern their systems of higher education. The complexity in classifying all fifty states and the District of Columbia into a unified taxonomy is a daunting task few researchers have attempted (c.f.,
Hendrickson and Mangum, 1977; McGuiness, 1997; Weerts, et al., 2012). McGuiness (1997) developed perhaps the most extensive classification of states into levels of authority based on their governing or coordinating boards. The more common approach has been to use state case studies representative of key patterns (c.f., Richardson, et al., 1998; Bracco, et al., 1999). These types of taxonomies are outside the realm of this dissertation. The focus herein is on the relationship between public and private higher education at the state level and on how this relationship has evolved over space and through time.

It has been well-documented that the ratio of public to private (i.e., private, non-profit) enrollment changed markedly in the early twentieth century. Goldin and Katz (1998a) reported that enrollment in public, four-year IHE as a percentage of total enrollment increased from 22 percent in 1897 to nearly 50 percent in 1941, when the U.S. entered WWII. When both four- and two-year enrollment is considered, public enrollment reached nearly 80 percent of total enrollment in higher education in 1980 and 1990 (c.f., Goldin and Katz, 2008; Table 6.3.).

Concurrently, there also were important changes in the provision of private higher education (see Table 5.3.). The private higher education market was almost entirely comprised of private, non-profit IHE from the founding of Harvard College in 1636 until the mid-1970s, when the private, for-profit higher education movement gained momentum (see Chapter 4, Section 4.4.5.). As public and private, for-profit IHE experienced strong growth in the 1980s, the proportion of private, non-profit IHE was declining (see Chapter 4, Section 4.4.6.). The share of private, non-profit IHE fell from 60 percent of all IHE in 1939 to 37 percent of all IHE in 2007. Meanwhile, the share of private, for-profit IHE grew from less than one percent in 1970 to 24 percent in 2007.
Understanding the patterns of change in the numbers of IHE across CONTROL at the state level provides insight into state priorities with regard to higher education (see Chapter 5). The traditional higher education core of U.S. higher education originated in the Northeast (see Figure 4.2). There is the notion that western states could not catch up with their northeastern counterparts in the establishment of private, non-profit IHE (c.f., Goldin and Katz, 1998a, 2001, 2008). Moreover, there is the contention that

[s]ome states have extremely good private higher education systems and some have extremely good public higher education systems, but few states have both, with California and Illinois among the notable exceptions (Goldin and Katz, 2001: 7).

Data show, however, that more states are developing diversified systems of higher education which offer strong systems of both public and private, non-profit IHE. Since 1930, eleven states consistently have shown above-average numbers of both public and private, non-profit IHE (Table 3.7.). The regional diversity within the table indicates that some states within each region have developed dual systems of public and private, non-profit higher education. Even though California was the only state in the West to appear in the table, California accounted for 8.4 percent of the nation’s public and 8.2 percent of the nation’s private, non-profit IHE in 2007. Only New York surpassed California in terms of the percentage of the nation’s private, non-profit IHE (11.7 percent) in 2007.
### Table 3.7.: States with above-average numbers of both public and private, non-profit IHE, 1939-2007

<table>
<thead>
<tr>
<th>State</th>
<th>Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>California</td>
<td>West</td>
</tr>
<tr>
<td>Georgia</td>
<td>South</td>
</tr>
<tr>
<td>Illinois</td>
<td>Midwest</td>
</tr>
<tr>
<td>Michigan</td>
<td>Midwest</td>
</tr>
<tr>
<td>Minnesota</td>
<td>Midwest</td>
</tr>
<tr>
<td>Missouri</td>
<td>Midwest</td>
</tr>
<tr>
<td>North Carolina</td>
<td>South</td>
</tr>
<tr>
<td>New York</td>
<td>Northeast</td>
</tr>
<tr>
<td>Ohio</td>
<td>Midwest</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>Northeast</td>
</tr>
<tr>
<td>Texas</td>
<td>South</td>
</tr>
</tbody>
</table>

Source: Calculations derived from author’s database. See Chapter 2, Section 2.3. for sources.

Nine of the states with above-average numbers of both public and private, non-profit IHE showed above-average numbers of private, for-profit IHE in 2007. Of the states in Table 3.7, only Michigan and North Carolina exhibited below-average numbers of private, for-profit IHE in 2007. Despite the relative newness of private, for-profit IHE, they were present in the database in all states except Delaware and Montana in 2007. The policies, quality, and governance of private, for-profit IHE have been called into question (c.f., Gladieux, 1995; Bailey, et al., 2001; McCluskey and Edwards, 2009; Wildavsky, 2011). However, the role of private, for-profit IHE in U.S. higher education is growing, and the sector is developing a distinct spatial component (see Chapter 4, Section 4.4.5., Chapter 5, and Chapter 6). Six states (i.e., California, Florida, Pennsylvania, Ohio, Texas, and New York)
contained approximately 45 percent of all private, for-profit IHE in 2007.

While there has been a diversification of higher education across CONTROL at the state level, it is clear that some of the patterns discussed here are tied to population. Usdan, et al. (1969) noted that the most populous states in 1965 also were the states with the highest enrollment in higher education. Many of these patterns hold true today. The changing relationship between IHE, enrollment, and population in terms of over- and under-representation of higher education at the state level will be addressed using LQ in Chapters 5 and 6. The next sections in this chapter address changing demographic factors and their role in shaping U.S. higher education after WWII.

3.5. The demographic context

Just as state, federal, and educational factors produced changes in the role of higher education in U.S. society, so too did demographic factors contribute to key changes in higher education after WWII. Education has long been viewed as a “major means of upward social mobility” (Dressel, 1956: 51). Access to education also has been shown to correlate with social change and social outcomes (e.g., Anderson, 1965; OECD, 2013a). Moreover, motivations to achieve a higher level of education have been linked both to socioeconomic circumstances and to economic opportunity. In particular, studies show that parents’ education levels contribute to their children’s attendance (USDE, 2001) and persistence (Warburton, et al., 2001) in higher education. Three aspects of the changing demographic context in the U.S. are examined herein: the geographic distribution of the population (Section 3.5.1.), the age structure of the population (Section 3.5.2.), and the demographic composition of the student population (Section 3.5.3.).
3.5.1. Geographic distribution of the population

Since the first Census of population was taken in 1790, the resident population of the U.S. has grown, the land area of the country has increased, and the population density per square mile has risen (Table 3.8.). The U.S. population increased more than sixteenfold between 1790 and 1890, while population density increased more than fourfold during the same time period. The density of population in the U.S. has grown steadily since the second industrial revolution in the late 1880s. As the U.S. became increasingly industrialized between 1890 and 1940, both population and population density more than doubled as there was a rural to urban shift in population (Educational Policies Commission, 1938; Fonseca and Wong, 2000). In the post-WWII period (i.e., 1940 to 2010), population more than doubled again, while population density nearly doubled as well.

Examining the largest cities in the U.S. between 1900 and 2010 reveals noticeable trends, both in terms of city size and geographic location. New York consistently was the largest city in the nation during this time period (Table 3.9.). The population of New York more than doubled between 1900 and 1940. In addition, the sizes of the ten largest U.S. cities grew considerably as well. In 1900, three of the largest ten cities had populations greater than one million. By 1940, four of the largest ten cities had populations greater than one million. By 2010, nine of the largest ten cities had populations over one million persons. As U.S. cities grew in size, a geographic shift in the locations of the largest cities occurred as well.
Table 3.8.: U.S. population and density of population, 1790–2010

<table>
<thead>
<tr>
<th>Year</th>
<th>Resident population</th>
<th>Land area, in square miles</th>
<th>Population per square mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>1790</td>
<td>3,929,214</td>
<td>864,746</td>
<td>4.5</td>
</tr>
<tr>
<td>1800</td>
<td>5,308,483</td>
<td>864,746</td>
<td>6.1</td>
</tr>
<tr>
<td>1810</td>
<td>7,239,881</td>
<td>1,681,828</td>
<td>4.3</td>
</tr>
<tr>
<td>1820</td>
<td>9,638,453</td>
<td>1,749,462</td>
<td>5.5</td>
</tr>
<tr>
<td>1830</td>
<td>12,866,020</td>
<td>1,749,462</td>
<td>7.4</td>
</tr>
<tr>
<td>1840</td>
<td>17,069,453</td>
<td>1,749,462</td>
<td>9.8</td>
</tr>
<tr>
<td>1850</td>
<td>23,191,876</td>
<td>2,940,042</td>
<td>7.9</td>
</tr>
<tr>
<td>1860</td>
<td>31,443,321</td>
<td>2,969,640</td>
<td>10.6</td>
</tr>
<tr>
<td>1870</td>
<td>39,818,449</td>
<td>2,969,640</td>
<td>13.4</td>
</tr>
<tr>
<td>1880</td>
<td>50,155,783</td>
<td>2,969,640</td>
<td>16.9</td>
</tr>
<tr>
<td>1890</td>
<td>62,947,714</td>
<td>2,969,640</td>
<td>21.2</td>
</tr>
<tr>
<td>1900</td>
<td>75,994,575</td>
<td>2,969,834</td>
<td>25.6</td>
</tr>
<tr>
<td>1910</td>
<td>91,972,266</td>
<td>2,969,565</td>
<td>31.0</td>
</tr>
<tr>
<td>1920</td>
<td>105,710,620</td>
<td>2,969,451</td>
<td>35.6</td>
</tr>
<tr>
<td>1930</td>
<td>122,775,046</td>
<td>2,977,128</td>
<td>41.2</td>
</tr>
<tr>
<td>1940</td>
<td>131,669,275</td>
<td>2,977,128</td>
<td>44.2</td>
</tr>
<tr>
<td>1950</td>
<td>150,697,361</td>
<td>2,974,726</td>
<td>50.7</td>
</tr>
<tr>
<td>1960</td>
<td>179,323,175</td>
<td>3,540,911</td>
<td>50.6</td>
</tr>
<tr>
<td>1970</td>
<td>203,302,031</td>
<td>3,540,023</td>
<td>57.4</td>
</tr>
<tr>
<td>1980</td>
<td>226,545,805</td>
<td>3,539,289</td>
<td>64.0</td>
</tr>
<tr>
<td>1990</td>
<td>248,709,873</td>
<td>3,536,278</td>
<td>70.3</td>
</tr>
<tr>
<td>2000</td>
<td>281,421,906</td>
<td>3,537,441</td>
<td>79.6</td>
</tr>
<tr>
<td>2010</td>
<td>308,745,538</td>
<td>3,531,905</td>
<td>87.4</td>
</tr>
</tbody>
</table>


Notes: 1 Beginning with 1960, data include Alaska and Hawaii.
2 Data exclude armed forces personnel stationed overseas.
<table>
<thead>
<tr>
<th>Rank</th>
<th>City</th>
<th>1960</th>
<th>1920</th>
<th>1940</th>
<th>1960</th>
<th>1980</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Chicago</td>
<td>3,695,575</td>
<td>2,701,765</td>
<td>Chicago</td>
<td>3,336,498</td>
<td>Chicago</td>
<td>3,550,404</td>
</tr>
<tr>
<td>3</td>
<td>Philadelphia</td>
<td>1,293,697</td>
<td>1,921,779</td>
<td>Philadelphia</td>
<td>1,921,339</td>
<td>Los Angeles</td>
<td>2,479,013</td>
</tr>
<tr>
<td>4</td>
<td>St. Louis</td>
<td>575,238</td>
<td>993,078</td>
<td>Detroit</td>
<td>1,623,452</td>
<td>Philadelphia</td>
<td>2,902,512</td>
</tr>
<tr>
<td>5</td>
<td>Boston</td>
<td>560,892</td>
<td>796,841</td>
<td>Los Angeles</td>
<td>1,504,277</td>
<td>Detroit</td>
<td>1,670,144</td>
</tr>
<tr>
<td>6</td>
<td>Baltimore</td>
<td>508,557</td>
<td>772,897</td>
<td>Cleveland</td>
<td>878,336</td>
<td>Baltimore</td>
<td>939,024</td>
</tr>
<tr>
<td>7</td>
<td>Cleveland</td>
<td>381,768</td>
<td>748,060</td>
<td>Baltimore</td>
<td>859,106</td>
<td>Houston</td>
<td>938,219</td>
</tr>
<tr>
<td>8</td>
<td>Buffalo</td>
<td>352,387</td>
<td>733,824</td>
<td>St. Louis</td>
<td>816,048</td>
<td>Cleveland</td>
<td>876,050</td>
</tr>
<tr>
<td>9</td>
<td>San Francisco</td>
<td>342,782</td>
<td>588,343</td>
<td>Boston</td>
<td>776,816</td>
<td>Washington, DC</td>
<td>763,956</td>
</tr>
<tr>
<td>10</td>
<td>Cincinnati</td>
<td>329,902</td>
<td>576,073</td>
<td>Pittsburgh</td>
<td>671,639</td>
<td>St. Louis</td>
<td>750,026</td>
</tr>
</tbody>
</table>

There were distinct changes in the geographic locations of the cities with the largest populations between 1900 and 2010. Specifically, there were marked shifts to the west and south in terms of the regional locations of the largest cities. In 1900, nine of the largest ten cities were in either the Northeast or Midwest regions (see Chapter 2, Table 2.1. for Census region definitions); by 2010, the Northeast and Midwest regions accounted for only three out of the largest ten cities in the nation. San Francisco was the only city in the West to hold a place in the largest ten cities in 1900. Los Angeles emerged as the tenth largest city in 1920 and rose to third largest by 1960. There were no South region cities represented in the top ten largest cities until 1960, when Houston became the sixth largest U.S. city.

For the Northeast and South regions, 1940 marked a key date in the decline or rise of these two regions in terms of their presence among the largest U.S. cities. Specifically, after 1940, the number of cities within the top ten fell for the Northeast and rose for the South. For the Midwest and West regions, 1960 was a turning point. After 1960, the number of Midwest cities in the top ten declined, while the number of West cities increased. By 2010, the West contained four, the South contained three, the Northeast contained two, and the Midwest contained one of the largest ten cities\(^{15}\) (see Section II of the dissertation).

3.5.2. Age structure of the population

As the geographic distribution of population in the U.S. shifted after WWII, the age structure of the population changed as well. Enrollment in public primary and secondary schools in the U.S. dropped between 1934 and 1946 as a result of declining numbers of

\(^{15}\) Research into the internal migration of the U.S. population after 1940 has been extensive (e.g., Bogue, 1954; MacLean and Dodson, 1956; Borchert, 1972; Shumway and Otterstrom, 2001; Hobbs and Stoops, 2002).
children (Goodykoontz, 1945). The return of U.S. veterans from WWII spurred a post-War increase in births, commonly referred to as the "baby boom." The baby boom typically is dated between 1946 and 1964 (e.g., Hacker, 2000), yet pre-WWII increases in the birth rate were evident as early as 1942.

An all-time low was reached in the years of the great depression when, in 1935, the rate was only 16.9 per 1,000 inhabitants. It changed little until 1942, when it jumped to 20.8 per 1,000. In 1947 it reached an all-time high of 25.8 per 1,000 . . . (MacLean and Dodson, 1956: 15).

The baby boom cohort first became apparent in the 1950 Census, and the cohort's movement clearly is visible in U.S. population data (Table 3.10.). As the baby boom cohort entered adulthood in the 1960s and 1970s, enrollments in IHE expanded significantly (e.g., McKibben, et al., 1999). The number of high school graduates declined slightly between 1980 and 1990, yet aggregate enrollment in higher education increased (Gueverra, 2001) (see Chapter 6).

While population increases associated with the baby boom were "spread fairly evenly throughout the nation" (McKibben, et al., 1999: 44), later boomlets (i.e., smaller birth rate increases associated with the children and grandchildren of baby boomers) have been more geographically concentrated (Keller, 2001). The Northeast and Massachusetts, in particular, faced a decline in total enrollment between 1988 and 1992 (Gueverra, 2001). West (i.e, Arizona, California, Nevada) and South (i.e., Florida, Georgia, Texas) region states faced the greatest potential enrollment growth as a result of the changing population patterns (c.f., Thomas, 2004; Table 3.9.) and the boomlet entering IHE (Keller, 2001) (see Chapter 6).
Table 3.10.: Percent distribution of population, by age, 1860–2010

<table>
<thead>
<tr>
<th>Year</th>
<th>Under 5</th>
<th>5–19</th>
<th>20–44</th>
<th>45–64</th>
<th>65 and over</th>
</tr>
</thead>
<tbody>
<tr>
<td>1860 1</td>
<td>15.4</td>
<td>35.8</td>
<td>35.7</td>
<td>10.4</td>
<td>2.7</td>
</tr>
<tr>
<td>1870 1</td>
<td>14.3</td>
<td>35.4</td>
<td>35.4</td>
<td>11.9</td>
<td>3.0</td>
</tr>
<tr>
<td>1880 1</td>
<td>13.8</td>
<td>34.3</td>
<td>35.9</td>
<td>12.6</td>
<td>3.4</td>
</tr>
<tr>
<td>1890 2</td>
<td>12.2</td>
<td>33.9</td>
<td>36.9</td>
<td>13.1</td>
<td>3.9</td>
</tr>
<tr>
<td>1900</td>
<td>12.1</td>
<td>32.3</td>
<td>37.7</td>
<td>13.7</td>
<td>4.1</td>
</tr>
<tr>
<td>1910</td>
<td>11.6</td>
<td>30.4</td>
<td>39.0</td>
<td>14.6</td>
<td>4.3</td>
</tr>
<tr>
<td>1920</td>
<td>10.9</td>
<td>29.8</td>
<td>38.4</td>
<td>16.1</td>
<td>4.7</td>
</tr>
<tr>
<td>1930</td>
<td>9.3</td>
<td>29.5</td>
<td>38.3</td>
<td>17.4</td>
<td>5.4</td>
</tr>
<tr>
<td>1940</td>
<td>8.0</td>
<td>26.4</td>
<td>38.9</td>
<td>19.8</td>
<td>6.8</td>
</tr>
<tr>
<td>1950</td>
<td>10.7 3</td>
<td>23.2</td>
<td>37.6</td>
<td>20.3</td>
<td>8.1</td>
</tr>
<tr>
<td>1960</td>
<td>11.3</td>
<td>27.1</td>
<td>32.2</td>
<td>20.1</td>
<td>9.2</td>
</tr>
<tr>
<td>1970 1</td>
<td>8.4</td>
<td>29.5</td>
<td>31.7</td>
<td>20.6</td>
<td>9.8</td>
</tr>
<tr>
<td>1980</td>
<td>7.2</td>
<td>24.8</td>
<td>37.1</td>
<td>19.6</td>
<td>11.3</td>
</tr>
<tr>
<td>1990</td>
<td>7.6</td>
<td>21.3</td>
<td>40.1</td>
<td>18.6</td>
<td>12.5</td>
</tr>
<tr>
<td>2000</td>
<td>6.8</td>
<td>21.8</td>
<td>37.0</td>
<td>22.0</td>
<td>12.4</td>
</tr>
<tr>
<td>2010</td>
<td>6.5</td>
<td>17.5</td>
<td>26.6</td>
<td>26.4</td>
<td>13.0</td>
</tr>
</tbody>
</table>


Notes: 1 Excludes persons for whom age was not available.
2 Excludes persons enumerated in the Indian Territory and on Indian reservations.
3 Shaded areas denote age of baby boom cohort.
3.5.3. Demographic composition of the student population

Just as there were changes in the geographic distribution and age structure of the population after WWII, so too there were key changes in the demographic characteristics of U.S. society after WWII. Specifically, the Brown v. Board of Education Ruling in 1954 (see Section 3.4.) set the stage for the desegregation of public schools and the civil rights movement. President John F. Kennedy's Executive Order 10925, which established the President's Committee on Equal Employment Opportunity, made the first mention of the phrase affirmative action to refer to the promotion of non-discrimination across "race, creed, color, or national origin" (Kennedy, 1961: 1). The Civil Rights Act of 1964 expanded the definition of equal protection by including non-discrimination based on sex (U.S. Congress, 1964). The Voting Rights Act of 1965 (Johnson, 1965), Title IX of the 1972 HEA (U.S. Department of Justice, 2013), the Rehabilitation Act of 1973 (USDE, Office for Civil Rights, 1996), and the Age Discrimination Act of 1975 (USDE, Office for Civil Rights, 1996) prohibited discrimination in voting, sex, disability, and age, respectively. The Adams case in 1977 mandated that "the federal government establish new, uniform criteria for statewide desegregation" in higher education (USDE, Office for Civil Rights, 2005: 2). All of these measures helped pave the way for growing equality and diversity in U.S. society. The subsequent sections examine the diversification of higher education after WWII in terms of ethnicity (Section 3.5.3.1.), sex (Section 3.5.3.2.), and age (Section 3.5.3.3.)
3.5.3.1. Ethnicity

The demographic composition of students enrolled in IHE has become gradually more ethnically diverse since the civil rights movement. The approximately 102 accredited Historically Black Colleges and Universities (HBCUs) (White House Initiative on Historically Black Colleges and Universities, 2011) were the sole providers of higher education to Black students prior to the enactment of the Civil Rights Act. The definition of HBCUs is: “institutions established prior to 1964, whose principal mission is the education of Black Americans” (Provasnik and Shafer, 2004: 1).

The collection of ethnicity data for higher education has been relatively recent. Hispanics were not separated in federal data collection until the mid-1970s (Husdon, 2002). In addition, the USDE did not begin reporting ETHNICITY data at the institutional level until 1980. The percentages of students across ethnic groups have changed markedly since the 1970s. Pryor, et al. (2007) found that nearly 91 percent of full-time, first-time freshman were White in 1971, whereas 76 percent were White in 2006. When all students are considered (i.e., full-time, part-time, graduate, undergraduate, etc.), the White population declined from 81 percent in 1980 to 59 percent in 2007 (see Table 6.6.). The percentage of Hispanic students more than tripled between 1980 and 2007 (c.f., Table 6.6. and Aud, et al., 2010).

The dissertation uses USDE (USDE, Institute of Education Sciences, National Center for Education Statistics, 2009) designations in reporting and discussing student ethnicity (see Chapter 2, Section 2.3.1.4). Enrollment by ETHNICITY for White, Black, Hispanic, Asian, Indian, non-resident alien, and no race identified students is available in the database for 1980 through 2007.

See Allen and Jewell (2002), Kim (2002), and Minor (2008) for detailed, historical research on HBCUs.
Despite increased diversification across ethnicity since the 1970s, continuing inequality with regard to opportunity in and access to higher education remains (c.f., Chang, et al., 2003). For example, Blacks and Hispanics remain underrepresented in admission to selective IHE (Fullinwider, 2013) and among degree recipients (Perna, 2005), even though Hispanic populations are increasing in the largest U.S. cities (Roach, 2009). In addition, there are regional differences in higher education completion rates for Blacks and Whites (Kodrzycki, 2004).

3.5.3.2. Sex

The balance of male-to-female students enrolled in IHE has shifted over time; between 1900 and 1930, the ratios were nearly equal (Goldin, et al., 2006). Male enrollment outpaced female enrollment between the 1940s and 1950s for two reasons: WWII and Korean G.I. Bill recipients flooded into IHE (Hudson, 2002; Goldin, et al., 2006) and “young women were less likely than young men to continue education beyond high school” (Caplow, et al., 1991: 32) after WWII.

Labor force expectations for females rose in the 1960s and 1970s (Goldin, et al., 2006) and females began to delay marriage and postpone having children in favor of obtaining a higher education (Rindfuss, et al., 1996; Goldin and Katz, 2000). Consequently, there was a shift in the male-to-female ratio of college students beginning in the 1970s. Between 1970 and 1980, the percentage of female students in the U.S. grew from 41 to 51 percent (Hudson, 2002). One instigator of change in the female-to-male ratios of students was Title

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IX of the 1972 Education Amendments, which formally prohibited discrimination by sex in federally-funded educational programs and institutions (National Coalition for Women and Girls in Education, 2012; U.S. Department of Justice, 2013).

The dominance of men enrolled in higher education had diminished further by the 1980s. The percentage of females rose slightly between 1980 and 2007: the ratio of females increased from 51.5 to 57 percent, respectively (see Table 6.4. and Chapter 6, Section 6.2.3.). By 2003, more women than men were enrolled in both four- and two-year IHE (Goldin, et al., 2006). In addition, the proportion of females expressing an interest in graduate degrees grew markedly between 1966 (45 percent) and 2001 (76 percent) (Sax, et al., 2003). Overall, females have greater economic (i.e., income) and non-economic (i.e., health insurance, voting) gains than males in terms of benefits from higher education (c.f., Perna, 2005; Goldin, et al., 2006).

3.5.3.3. Age

There has been a growing diversity of students across age groups. There have been increasing numbers of “nontraditional” (Ewell, et al., 2008: 9) students since WWII. In 1970, there were an estimated 2.4 million adult students (i.e., aged 25 years and older) enrolled in IHE (Aslanian, 2007). Increases in enrollment for adults aged 25 to 34 years of age accounted for strong total enrollment growth during the 1970s (Hudson, 2002) (see Chapter 6). By 2004, the total number of adult students enrolled in IHE had grown to 7 million (Aslanian, 2007). It is estimated that adult students account for 40 percent of all enrollment in IHE (Hudson, 2002; Stokes, 2006; Aslanian, 2007). Adult students are more
likely to be part-time students and live off-campus than their younger counterparts (Twigg, 2002). In fact, “traditional 18-22 year-old full-time undergraduate students residing on campus account for only 16% of higher education enrollments” (Stokes, 2006: 1).

Several factors contributed to an increase in adult student enrollment at IHE. Firstly, a growing diversity of institutional choices beginning in the late 1950s contributed to increasing numbers of two-year IHE (see Chapter 4, Section 4.4.3. and Table 5.2.) and enrollment (see Table 6.2.) in the 1970s. Older students comprise approximately 40 percent of enrollment at community colleges (Stokes, 2006; Ewell, et al., 2008). Secondly, there are now more options for part-time study at IHE. During the 1970s, the proportion of students enrolled in IHE part-time increased from 32 to 41 percent (Hudson, 2002). The percentage of part-time students has remained fairly constant since that time (c.f., Stokes, 2006). Thirdly, online learning makes higher education more accessible for working adults (Stokes, 2006). However, the majority of adult students take their courses in a traditional classroom setting (Aslanian, 2007). In summary, there are now more options for older students to obtain a first degree, continue their schooling, or gain retraining.

3.6. Summary of the context

Chapter 3 addresses the secondary contribution of the dissertation, which centers on identifying a series of factors that shaped U.S. higher education after WWII. Educational, federal, state, and demographic factors contributed to a rise in institutional establishment and enrollment increases at IHE. In addition, these factors helped shape the evolving geography of U.S. higher education after WWII. This chapter summary examines how each factor influenced higher education and explores the linkages between the factors.
The idea of the educational context emphasizes that education is both a private and public good, contributing to physical, human, and social capital. The major functions of IHE—teaching, research, and public service (Perkins, 1973)—promote economic development at both the local and national levels. Changing occupational structures in the twentieth century increased the importance of a higher education and led to rising educational attainment. Education, the economy, and the role of the state are inextricably connected in U.S. society. Fluctuations in educational expenditures at the state and federal level, therefore, impact both human and social capital. In addition, the educational context is linked with demographic change as well. For example, “higher education became the means for bringing about professionalisation and for the substantial transformation of the restructuring of social inequality” (Urry, 1987: 271).

Federal action toward higher education typically has been a response to correct deficiencies or fill needs (Riley, 1994). Prior to the enactment of the G.I. Bill, the majority of federal funds to higher education were at the institutional level (i.e., land allocations, tax exemptions, and R&D spending). Federal grants and loans to higher education students comprise the majority of federal spending currently. The combined effect of all the federal influences on IHE (i.e., land, tax breaks, R&D, student aid) stimulated the establishment of new IHE. Thus, "the federal government played a pivotal role in shaping a capacious and inclusive system of higher education" (Skocpol and Mettler, 2008: 10).

State-level factors have played a crucial role in shaping higher education as well. The role of the state in public higher education was solidified with the enactment of the Morrill Act in 1862. In the 1960s, public higher education experienced a growth in the number of new IHE and students. Federal funding for the Korean and Vietnam War G.I. Bills played a role in the rise of public IHE and the baby boomers reaching college-age drove massive
enrollment growth during the 1960s. Direct state allocations to public IHE, however, have been declining since the 1980s. States allocate funding for IHE in different ways, depending on factors such as political and economic circumstances. Declines in state appropriations have contributed to the belief that "public higher education has become state-assisted rather than state-supported" (Change, 1999: 64). More recent forms of state-supported funding for higher education include state-based grants and aid. Just as state approaches to higher education are rooted in history and geography, so too are state variations in the organization of higher education based in historical and spatial contexts (see Chapter 4). Understanding the differences across states in the percentage of public and private enrollment over time relative to population provides additional context to understanding how states influence IHE (see Chapter 6).

In terms of the demographic context, the changing geographic distribution of the population, age structure of the population, and demographic composition of the student population combined to shape higher education in the post-WWII period and into the twenty-first century. There were shifts to the west and south in terms of the cities with the largest populations between 1900 and 2010 (see Table 3.9.). The changes in population distribution shaped the establishment of IHE in the post-WWII period (see Chapter 5). In addition, a surge of births among WWII veterans produced a baby boom, which had subsequent impacts on future enrollments in higher education. Concurrently, veterans attended IHE in record numbers as a result of the WWII, Korean, and Vietnam G.I. Bills. In the 1960s and 1970s, as the number of both actual and potential students increased, enrollments at existing IHE grew, and new IHE were established to meet the growing demand for higher educational services. Moreover, in the decades following WWII, there was a greater diversity of higher education students (e.g., OECD, 2013b). For example,
females have been represented in greater numbers than males on college campuses since 1980, and the gap is widening (see Table 6.4.). The changes in the demographic composition of the student body followed patterns in larger U.S. society of growing diversity across ethnicity, sex, and age.

Chapter 3 examined how educational, federal, state, and demographic factors influenced higher education in the U.S. This concludes Part I of the dissertation, which presented the introduction, methods, and context for the research. Part II of the dissertation begins with Chapter 4, which examines the history of U.S. higher education via literature and maps.
Part II

THE ANALYSES
Chapter 4

HIGHER EDUCATION HISTORY IN SPATIAL CONTEXT

... higher education built upon prewar trends to do what almost no one would have predicted: it achieved a virtual monopoly on middle class status. It became the licensing agency for Americans who wanted to enter the professions... For countless Americans, going to college was the route upward; they expected their governments at every level to help make that happen—grants and loans to students, branch campuses of the state university, local community colleges (Lazerson, 1998: 3).

4.1. Introduction

Part I of the dissertation establishes the methodological (Chapter 2) and contextual (Chapter 3) bases of the research. The present chapter begins Part II of the dissertation, which contains the results of historical, descriptive, and spatial analysis of U.S. higher education. Chapter 4 summarizes the origins of U.S. higher education, beginning with the founding of Harvard College in 1636, through to the twenty-first century. The discussion of U.S. higher education history herein is divided into four main time periods:

- the first era begins with the founding of Harvard and ends one year prior to the passage of the first Morrill Act (1636-1861),
- the second phase begins with the passage of the first Morrill Act and ends prior to U.S. involvement in WWII (1862-1940),
- the third time period begins with the United States’ entry into WWII and ends at the close of the twentieth century (1941-1999), and
- the final era examines higher education in the early part of the twenty-first century (2000-2007).

The description of higher education history throughout the chapter focuses on identifying key dates, distinguishing institutional characteristics, delineating founding patterns, tracing enrollment trends, and mapping the locations of institutions of higher education (IHE) during the different time periods. The chapter concludes with a summary relating the
history of U.S. higher education to the series of educational, federal, state, and demographic explanatory factors outlined in Chapter 3.

4.2. Early privates: higher education before 1862

The provision of U.S. higher education was decidedly private, non-profit in terms of control and distinctly local in terms of geography from the time of the founding of Harvard College in 1636 until the passage of the first Morrill Act in 1862.

...higher education began expanding before the transportation revolution, before industrialization, before full marketization and before the rush of professional regulation. It grew even before such inducements forged a mandatory link between formal education and careers... (Burke, 1983: 110).

The numbers of IHE and students both were categorically small during this time period. A total of 422 surviving IHE were established between 1636 and 1861 (Table 4.1.).

The mean annual rate of institution founding between 1636 and 1861 was approximately 2 IHE per year. However, the rate of institution founding varied markedly during these years (Table 4.2.). Less than one institution per year was established on average during the Colonial era (1636-1774). Institution founding rates rose slightly between the Revolutionary War and the passage of the Dartmouth College Case in 1819. The period following the enactment of the Dartmouth College Case (1820-1861) was characterized by a relative proliferation of private, non-profit colleges; five-year average founding rates surpassed 10 IHE per year after 1850, peaking at more than 14 IHE per year between 1854 and 1858 (Figure 4.1.).

---

Counts of IHE within Section 2 of the dissertation are based upon the dissertation database, which includes all two- and four-year accredited IHE open for any recordable period of time between 1939 and 2007 (see Chapter 2, Section 2.2. for a description of the database parameters).
Table 4.1: IHE established, by era, 1636-2007

<table>
<thead>
<tr>
<th>Era dates</th>
<th>New IHE established</th>
<th>Number of years in era</th>
<th>Mean number of IHE established by year</th>
<th>Percent of all IHE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1636-1861</td>
<td>422</td>
<td>226</td>
<td>2</td>
<td>7.9</td>
</tr>
<tr>
<td>1862-1940</td>
<td>1,799</td>
<td>79</td>
<td>23</td>
<td>33.7</td>
</tr>
<tr>
<td>1941-1999</td>
<td>2,650</td>
<td>59</td>
<td>45</td>
<td>49.6</td>
</tr>
<tr>
<td>2000-2007</td>
<td>166</td>
<td>8</td>
<td>21</td>
<td>3.1</td>
</tr>
<tr>
<td>TOTAL</td>
<td>5,037</td>
<td>372</td>
<td>13</td>
<td>94.3</td>
</tr>
<tr>
<td>No date known</td>
<td>302</td>
<td></td>
<td></td>
<td>5.7</td>
</tr>
<tr>
<td>TOTALS</td>
<td>5,339</td>
<td></td>
<td></td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Calculations derived from author's database. See Chapter 2, Section 2.3. for sources.

Table 4.2: IHE established, 1636-1861

<table>
<thead>
<tr>
<th>Era</th>
<th>Dates</th>
<th>New IHE established</th>
<th>Number of years in era</th>
<th>Mean number of IHE established by year</th>
</tr>
</thead>
<tbody>
<tr>
<td>pre-1862</td>
<td>1636-1774</td>
<td>15</td>
<td>139</td>
<td>0.1</td>
</tr>
<tr>
<td></td>
<td>1775-1819</td>
<td>61</td>
<td>45</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1820-1861</td>
<td>346</td>
<td>42</td>
<td>8</td>
</tr>
<tr>
<td>TOTALS</td>
<td>422</td>
<td>226</td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

Source: Calculations derived from author's database. See Chapter 2, Section 2.3. for sources.
Figure 4.1: New IHE established, by year, 1636-1861
Note: Trend line reflects running mean using 5-year intervals.
Source: Data derived from author's database. See Chapter 2, Section 2.3, for sources.
In terms of students, insufficient elementary and secondary education structures contributed to low enrollment in IHE prior to 1862. In many cases, IHE were founded in towns before formal elementary or secondary education systems were established (Boorstin, 1966; Jencks and Riesman, 1968). Fewer than 1,300 students were enrolled in IHE in 1800 (Table 4.3.). There were 41 surviving IHE in the dissertation database established by 1800. On average, therefore, each IHE had fewer than 31 students in 1800.\(^2\) By 1860, enrollment had grown to more than 32,000 students. Total enrollment at individual IHE remained small; there were 413 surviving IHE in the database in 1860, which translated to fewer than 80 students at each IHE. The characteristics of IHE founded prior to 1862 are examined subsequently; variations in enrollment trends are highlighted and the changing spatial patterns of institution founding are detailed.

<table>
<thead>
<tr>
<th>Year</th>
<th>Students</th>
<th>Percent change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1800</td>
<td>1,237</td>
<td></td>
</tr>
<tr>
<td>1810</td>
<td>2,562</td>
<td>107.1</td>
</tr>
<tr>
<td>1820</td>
<td>3,872</td>
<td>51.1</td>
</tr>
<tr>
<td>1830</td>
<td>7,822</td>
<td>102.0</td>
</tr>
<tr>
<td>1840</td>
<td>12,964</td>
<td>65.7</td>
</tr>
<tr>
<td>1850</td>
<td>17,556</td>
<td>35.4</td>
</tr>
<tr>
<td>1860</td>
<td>32,364</td>
<td>84.4</td>
</tr>
<tr>
<td>1870</td>
<td>62,000</td>
<td>91.6</td>
</tr>
</tbody>
</table>

Source: Burke (1983).

\(^2\) Taking into account IHE which closed or merged prior to 1939 would dramatically lower the per-IHE enrollment count.
4.2.1. Higher education origins, 1636-1774

The first classes began at Harvard in 1638. At the time, students who enrolled at Harvard studied primarily classical and theological subjects, although some sciences (e.g., astronomy, physics) were taught as well (Morison, 1928). A total of fifteen surviving IHE were established before the Revolutionary War began in 1775 (Figure 4.2.). The most prestigious Colonial IHE (i.e., the College of William and Mary, Yale, the University of Pennsylvania, Princeton, Columbia, Brown, Rutgers, and Dartmouth) emulated Harvard, whose structure followed the English traditions of Oxford and Cambridge (Brubacher and Rudy, 1958; Morison, 1963; Torbenson, 1992). However, recreating the English paradigm of higher education within the colonies proved to be difficult due to dispersed populations, low enrollments, and differing motivations for establishing IHE.

Firstly, the geographically dispersed Colonial population led to a scattered pattern of IHE (see Figure 4.2.). Limited transportation technologies of the time exacerbated the diffuse and decentralized (Torbenson, 1992) provision of higher education in the colonies.

---

3 The number of IHE established before the Revolutionary War has been the source of some debate. Here, the calculation of fifteen IHE is based on the founding dates of institutions as reported by the U.S. Department of Education. Other accounts (e.g., Tewksbury, 1932; Veysey, 1965; Cowley and Williams, 1991) refer to the existence of nine Colonial colleges: Harvard University (established in 1636), the College of William and Mary (1693), Yale University (1701), the University of Pennsylvania (1740), Princeton University (1746), Columbia University (1754), Brown University (1764), Rutgers University (1766), and Dartmouth College (1769). However, six additional IHE also were established before the Revolutionary War: Annhurst College (established in 1683, closed in 1980), Moravian College for Women (1742), Washington and Lee University (1749), the College of Charleston (1770), Salem College (1772), and Dickinson College (1773).

4 There have been extensive discussions of the “elite” IHE founded during the Colonial era. Veysey (1965), in particular, has been criticized (see Angelo, 1983) for relying on this small, select group of IHE to represent the U.S. higher education system as a whole.
Figure 4.2.: Locations of new IHE, 1636-1774
Total number of IHE established = 15.
Source: Mapped using current zip codes and state boundaries. Data derived from author’s database. See Chapter 2, Section 2.3. for sources.
In order to attract students and/or receive supplies, Colonial IHE needed to be located near a navigable river, an established port, or an existing trade center. Secondly, a lack of concentrated population translated into understandably low enrollment in Colonial IHE. Even if Colonists wished to attend an institution of higher learning, “[o]nly a few colonial towns had a school that could prepare young people for college” (Jencks and Riesman, 1968: 91). By 1651, which was more than a decade after students first enrolled, Harvard’s graduating class consisted of only 10 students (Morison, 1928). Weak elementary and secondary education structures contributed to low enrollment in IHE as did the reality that young people living in the colonies had daily life concerns beyond education (Handlin and Handlin, 1970).

Thirdly, the emulation of English higher education in the colonies was problematic because the United States’ aims for establishing IHE differed significantly from English motives. Whereas English IHE focused on classical education, Colonial IHE were established primarily as centers for ministerial training (Brown, 1903). Religion was an important cultural influence on Colonial society which affected U.S. higher education curricula, institutional focus, and the dissemination of knowledge in the seventeenth and eighteenth centuries.\(^5\) Ironically, the sectarian interests of IHE fostered distrust on the part of many Colonial residents (Brown, 1903), which indirectly discouraged potential enrollment. The pervasiveness of religious influences on higher education is reinforced by realizing that the University of Pennsylvania was the only one of the Colonial IHE not founded by a religious organization (Astin and Lee, 1972).

---

\(^5\) Hofstadter and Smith (1961: 2) contend that there was little distinction “between secular and theological learning” during this time period.
While each of the aforementioned reasons—motivations for establishing IHE, low enrollments, and dispersed population—speaks to the challenges in replicating the English system of higher education in the colonies, the third reason raises key issues about the separation of church and state which would emerge during the American Revolution. In the Colonial era, there were no IHE that were entirely funded by private sources. Most Colonial IHE received funding from both private donations and government (i.e., Colonial and English) sources; Harvard, for example, accepted governmental support until 1824 (Morison, 1928). Growing religious diversity within the colonies during and after the Revolutionary War raised new questions about the role of Colonial government in higher education. Thus, IHE began to seek greater autonomy and less governmental involvement. As the colonies became increasingly cognizant of the conflicts arising from governmental funding for religious IHE, a realization arose that the colonies would either have to modify existing IHE or erect new ones to foster the separation of church and state (c.f., Brown, 1903).

4.2.2. New roles for the state in higher education, 1775-1819

Once the American Revolution began in 1775, the connection between church and state began to weaken in Colonial society, and new questions arose regarding the role of public government in IHE (see Chapter 3, Section 3.4.).

Civil authorities partially controlled or attempted completely to control six of the nine colonial colleges: Harvard, Yale, Pennsylvania, Columbia, William and Mary, and Dartmouth. In no case did they succeed for long in their efforts, with the result that the advocates of state-supported universities turned to separate institutions rather than attempting to assume control over already existing private ones (Cowley and Williams, 1991: 118).
The nation was changing rapidly; the period between 1775 and 1819 ushered in the Land Ordinance (1785), the Northwest Ordinance (1787), the first U.S. Census (1790), and the Louisiana Purchase (1803). In addition, Ohio became the first public land state in 1803. As the nation developed economically and expanded spatially, U.S. higher education became more geographically dispersed as well (Figure 4.3.). While new IHE continued to develop near existing population centers in the Northeast and along navigable trade routes (i.e., the Ohio River valley), new IHE also began to appear in the Midwest (i.e., Illinois, Indiana, Michigan, and Ohio) and the South (i.e., Georgia, Kentucky, and Tennessee). In addition to the changing spatial patterns of institution founding, the mean annual founding rates IHE also increased; between 1775 and 1819 an average of one new institution per year was established.

As the nation gained newfound independence, the issues regarding the separation of church and state with regard to higher education re-emerged. The situation at Dartmouth College best illustrates the predicament. Internal discord between Dartmouth's president—John Wheelock, a Jeffersonian—and the board of trustees, composed largely of Federalists, was evident in the early 1800s (Cowley and Williams, 1991). After years of internal dissent, the board voted to dismiss Wheelock as president in 1815.

Wheelock then appealed to the newly-elected Jeffersonian governor, William Plumer, and the New Hampshire legislature, who rallied to his support. Plumer and the legislature revised the College charter, established a new institution called Dartmouth University, and made Wheelock its president under the direction of a reconstituted board of trustees . . . (Cowley and Williams, 1991: 119).

The original board of trustees contested New Hampshire's decision and, ultimately, appealed the case to the U.S. Supreme Court.
Figure 4.3.: Locations of new IHE, 1775-1819
Total number of IHE established = 61.
Source: Mapped using current zip codes and state boundaries. Data derived from author's database. See Chapter 2, Section 2.3. for sources.
In 1819, the Supreme Court ruled that the original English-based charter of Dartmouth College was to be upheld, and that New Hampshire’s intervention into altering the original charter (under Wheelock’s direction) was unconstitutional (Cowley and Williams, 1991). This decision was central to the future of U.S. higher education. Until 1819, the early “privates” (i.e., private, non-profit) were not wholly private—they actually received monies from either the Colonial or English governments. After the passage of the Dartmouth College Case, private IHE were officially recognized, and the United States’ divergence from the English model of higher education was formalized.

4.2.3. The missionary and booster college movement, 1820-1861

Private, non-profit IHE were founded with increasing rapidity after the Dartmouth College Case.

The decision in the Dartmouth College Case constituted a solid victory for those—Federalists and religionists—who believed that higher education should be kept in the hands of private enterprise, and it led to the founding before the Civil War of literally hundreds of denominational colleges throughout the expanding nation (Cowley and Williams, 1991: 119).

Between 1820 and 1861, 346 new IHE were established at an average rate of more than eight per year (see Table 4.2.). In contrast to the IHE established during the Colonial era, the IHE of the nineteenth century were less elite in their emphasis.

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Twenty public IHE were established prior to 1819. They faced a situation similar to that of their private counterparts:

... none of them had consistent financial support from their legislatures until late in the nineteenth century. Further, and much more important, some of them began under denominational auspices and became state universities much later, and the others operated for many years under partial or periodic church control (Cowley and Williams, 1991: 119).

For example, Rutgers University and the University at Buffalo both changed from private, non-profit to state control in 1956 and 1962, respectively (Harrah, 1969).
Specifically, the nineteenth-century IHE tended to be less expensive and less prestigious than their Colonial counterparts (Herbst, 1983). In addition, the types of locations of nineteenth-century IHE differed from the types of locations of the institutions established prior to 1820 (Figure 4.4.). While earlier IHE had located in close proximity to the population centers, ports, and navigable rivers of the period, nineteenth century IHE were less constrained in their locational choices due to the dispersion of population, which was made possible by the opening of new transportation routes, the development of new trade centers, and the advent of new technologies.

For instance, the opening of the Erie Canal in 1825 afforded greater accessibility to Upstate New York, leading to the rise of Buffalo and the development of IHE in western New York. Railroad linkages between New York City and Chicago in 1853 enabled greater accessibility to the interiors of Pennsylvania, Ohio, Indiana, and Illinois. Westward migration on the Oregon Trail beginning in 1842 brought education to the areas which would later become Oregon and Washington states. The Gold Rush brought new residents and new educational possibilities to California in 1849. Likewise, migration along the Mormon Trail preceded the founding of the University of Utah in 1850. The southern U.S. also saw an increase in the number of new IHE established during the mid-1800s. Prior to 1819, the South had few IHE; after the Louisiana Purchase and the subsequent annexation of Texas in 1845, IHE were established in every state in the South between 1820 and 1861.

Nineteenth-century attitudes about “appropriate” learning environments were a key factor in the proliferation of IHE in areas of low population density (c.f., Gilbert, 1961; Morrill and Beyers, 1991). In addition, land demands for new IHE often necessitated locations beyond cities (Jobling, 1970).
Figure 4.4.: Locations of new IHE, 1820-1861
Total number of IHE established = 346.
Source: Mapped using current zip codes and state boundaries. Data derived from author's database. See Chapter 2, Section 2.3. for sources.
The removal of the college from the city, so to speak, which occurred during the nineteenth century, may be traced to two principal motivations for making higher education local and non-urban: religious pluralism and local boosterism. U.S. religious pluralism paved the way for the small and religious college movements. The impact of religion on shaping higher education was substantial.

There was in fact a settled policy on the part of both Protestants and Catholics in the country at large to use education as an instrument for serving the needs and promoting the influence of their respective churches (Garraghan, 1941: 268). The diffusion of religion through missionary and conversion practices was common (Handlin and Handlin, 1970). Missionary IHE were intent on spreading religion into the new U.S. frontier through formal education and ministerial training (Turner, 1920; Butchart, 1980). Religious piety and diversity played an important role in establishing IHE throughout the newly-expanding country.

The proliferation of institution founding after the Dartmouth College Case was not only a private, non-profit phenomenon. In his study of the rise and development of the University of Michigan, Ten Brook (1875) examined the rise of union schools (i.e., branch campuses) in Michigan between 1837 and 1846. While the union school movement was short-lived—competition between localities and dwindling appropriations led to an 1849 resolution to stop the branch movement in Michigan—it demonstrated an early understanding by public IHE that a key objective of public education is to extend the benefits of higher education both widely and early (Ten Brook, 1875).

Civic idealism during the nineteenth century encouraged the idea of a "university in every town" (Boorstin, 1966; Jencks and Riesman, 1968; Handlin and Handlin, 1970). Local pride was instrumental in attracting and/or sustaining the numerous religious IHE which emerged in the nineteenth century. For, just as the different religious sects desired a college
in every town, so too did each town aspire to host a college. Local boosterism was driven by anticipation. In other words, communities supported IHE because of their potential for success.

Every fledgling community envisioned itself a distinguished future seat of learning, not merely out of the inevitable boosterism of the times, but also because colleges, like prisons, asylums, and other public institutions, contributed to the growth of the town—or so it was believed (Handlin and Handlin, 1970: 25-26).

The siting of a college or university in a town was often an important first step in putting the town “on the map.” Likewise, the decision to locate a university in a town could revitalize a dying place (Gilbert, 1961).

4.3. Early expansion: higher education between 1862 and 1940

After 1862, as U.S. higher education broadened its focus to include liberal education, scientific inquiry, and scholarly endeavor, the role of the small, private, non-profit IHE of the nineteenth century declined. Changing purposes and structures of higher education were key in this decline. Classical education and ministerial training dominated the higher education landscape prior to 1862; after that time, liberal and scientific education, as well as professionalism, rose in importance (c.f., Morrill, 1948; Ben-David, 1972). Higher education first became associated with research, development, and economic growth during this period.

The large university centers after the [Civil] war diversified through calls for advanced scholarship, research, and professional training. These, it was argued, were needed to stimulate national economic development, not just to satisfy individual ambition (Herbst, 1983: 201).

As the role of higher education in society changed, the rate at which IHE were founded changed as well (see Table 4.1., Figure 4.5.). Prior to 1862, the mean annual founding rate for U.S. IHE was 2 IHE per year. In the period between 1862 and 1940, 1,799 new IHE were
established, and the mean annual founding rate rose to 23 IHE year. At the same time, enrollment in higher education increased, a greater diversity of institutional types emerged, and the spatial extent of higher education spread.

4.3.1. The role of the Morrill Act, 1862-1928

The initial mention of possible subsidies for agricultural and mechanical IHE was suggested in 1819, when New York State’s surveyor-general published a pamphlet proposing the establishment of a state college that would provide experimental research in addition to education (Nevins, 1962). Subsequently, agricultural societies in other states began discussing the possible founding of agricultural and mechanical IHE (Nevins, 1962).

John S. Skinner, editor of assorted agricultural and industrial journals, petitioned Congress in 1848 for state subsidies to be used in founding colleges of agricultural and mechanic arts. Though most farmers were skeptical, he found supporters (Nevins, 1962: 19).

It was not until Justin Morrill, a resident of rural Vermont, was elected to the House of Representatives in the 1850s that the possibility of enacting legislation to establish such IHE was realized. The passage of the Morrill Act was not immediate; James Buchanan vetoed the initial bill put forth by Morrill and his supporters in 1859 (Nevins, 1962). In 1862, Abraham Lincoln signed the first Morrill Act.7

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7 The focus of the discussion here is the initial Morrill Act. The first Morrill Act and subsequent legislation concerning land-grant IHE could be a dissertation topic in and of itself (e.g., Sawyer, 1948; Wright, 1981; Duemer, 1996). The origins of the initial Morrill Act are detailed here because the Act was the primary instigator of subsequent, key changes in U.S. higher education. In 1890, the Second Morrill Act (see Christy, et al., 1992; Bonnen, 1992) was enacted, leading to the establishment of agricultural and mechanical IHE for African Americans; today, these IHE are among HBCUs (see Chapter 3, Section 3.5.3.1.). Subsequent federal legislation also enabled the establishment of land-grant experiment stations (e.g., the Hatch Act of 1887; the Adams Act of 1906) and agricultural extension services (e.g., Smith-Lever Act of 1914; the Capper-Ketcham Act of 1928). See Works and Morgan (1939), Ross (1942), Nevins (1962), Hyman (1986), and Williams (1991) for further discussion.
The Act enabled states to "select 30,000 acres of public land for each member of Congress" (Nevins, 1962: 3) in 1860; thus, land for the IHE was allocated in proportion to states’ populations at the time. In total, some 17 million acres of land were allocated among the states for the establishment of land-grant IHE. According to Allen (1950: 215), the land-grant IHE served as:

- a protest against the then characteristic dominance of the classics in higher education,
- a desire to develop college-level instruction relating to the practical activities of life, and
- an attempt to offer to those belonging to the industrial classes preparation for the "professions of life."

In essence, therefore, the land-grant IHE symbolized the adaptation of education to national needs. Further, the provision of public land for IHE reinforced the uniquely U.S. belief that "higher education should be a democratic possession" (Nevins, 1962: 6).

The central idea behind the land-grant movement was that liberty and equality could not survive unless all men had full opportunity to pursue all occupations at the highest practicable level. No restrictions of class, or fortune, or sex, or geographical position—no restrictions whatsoever—should operate (Nevins, 1962: 21-22).

The Morrill Act, thus, was predicated upon the Jeffersonian ideals of equality, access, and democracy for all citizens.

Understanding why the land-grant movement gained momentum when it did requires an understanding of the broader historical context of the mid-nineteenth and early twentieth centuries. The mid-to-late nineteenth century was a dynamic time in which the U.S. experienced both agricultural and industrial revolutions (see Chapter 3, Section 3.2.). Coupled with rapid changes in these aspects of society was a revolt against classical ideals of humanism and a movement toward democracy in education. U.S. higher education was experiencing a curriculum transformation in which science, economics, history, and modern
literature emerged in place of the classics (Nevins, 1962). Concurrently, scientific innovation was becoming more visible in U.S. society; *Scientific American* premiered in 1845, the Smithsonian Institution was established in 1846, and Darwin's *On the Origin of Species* was published in 1859. Scientific discovery and curricula transformation, thus, led to a changing concept of the role of higher education in U.S. society and contributed to a changing notion of the types of students who should, or could, attend college.

As the demand for agricultural workers declined due to technological innovation at the close of the nineteenth century, there was a greater necessity for young people to consider some form of advanced education and training.

With the consequent diminishing need of agricultural manpower during the past 60 years, about 60 percent of the persons born on farms in the United States have been released for occupations other than farming (Works and Morgan, 1939: 1).

According to the USDE (2000), approximately 52,000 students were enrolled in U.S. IHE during the 1869-70 academic year (Table 4.4.).

<table>
<thead>
<tr>
<th>Year</th>
<th>Students</th>
<th>Percent change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1869-70</td>
<td>52,286</td>
<td></td>
</tr>
<tr>
<td>1879-80</td>
<td>115,817</td>
<td>121.5</td>
</tr>
<tr>
<td>1889-90</td>
<td>156,756</td>
<td>35.4</td>
</tr>
<tr>
<td>1899-00</td>
<td>237,592</td>
<td>51.6</td>
</tr>
<tr>
<td>1909-10</td>
<td>355,213</td>
<td>49.5</td>
</tr>
<tr>
<td>1919-20</td>
<td>597,880</td>
<td>68.3</td>
</tr>
<tr>
<td>1929-30</td>
<td>1,100,737</td>
<td>84.1</td>
</tr>
</tbody>
</table>

Note: Data for 1869-70, 1879-80, 1889-90, and 1909-10 are estimated. Source: USDE (2000).
Over the next six decades, enrollment in IHE grew an average of 68 percent per year. By the 1929-30 academic year, more than 1.1 million students were attending IHE, an increase of more than 20 times the 1869-70 figures. Changing educational needs in a changing industrial society maintained the rising demand for higher education services and led to continued growth in the founding of new IHE.

While the Morrill Act authorized the establishment of public IHE in each of the existing states, its passage also served as a stimulus for the founding of new public and private, non-profit IHE across the nation. Geiger (1995: 59) asserts that “two dynamics—geographic extension largely in the West and denominational elaboration elsewhere—underlay the logistic pattern of college expansion in this era.” Nearly 1,800 new IHE were founded between 1862 and 1940, and this period was characterized by a growing diversity in types of locations for institution founding (Figure 4.6.).

As in earlier eras, transportation and industrial innovation facilitated the geographic spread of higher education. The nation expanded its territorial holdings with the Alaska purchase in 1867 and the annexation of Hawaii in 1898, while key railroad development literally “opened up” the country west of the Mississippi River. Higher education dispersion would not have been possible during this period without the Transcontinental Railroad, which connected California to the eastern U.S.—and points in between—in 1869. The completion of the Northern Pacific Railroad in 1883 enabled connections between Chicago and Oregon by way of the upper Plains and Mountain states. New centers of population and commerce, such as St. Louis, Denver, and Seattle, emerged and these places became new venues for higher education as well. “It was appropriate, too, that the gospel of the new higher education should not come from the great Eastern cities, which lay in the shadow of Old World learning, but from the West” (Boorstin, 1973: 481).
Figure 4.6.: Locations of new IHE, 1862-1940

Total number of IHE established = 1,799.

Source: Mapped using current zip codes and state boundaries. Data derived from author’s database. See Chapter 2, Section 2.3. for sources.
At least one new IHE was established in every U.S. state between 1862 and 1940. Thus, changing educational needs in a changing industrial society maintained the rising demand for higher education services and led to continued growth in the founding of new IHE across the nation; this trend continued even through the Great Depression.

4.3.2. Growth amid economic stagnation, 1929-1940

Higher education scholars (c.f., Angelo, 1983; Burke, 1983; Jarausch, 1983; Goldin and Katz, 1998b) have described the period between 1860 and 1930 as a dynamic and expansionary era in higher education. The period after WWII also is highlighted as a period in which higher education was transformed (see Section 4.4.). In contrast, the time between 1930 and 1940, is seldom mentioned within higher education literatures. At first glance, one might assume that little happened in higher education during these years as a consequence of the stock market crash and the Great Depression. However, 270 new IHE were founded between 1929 and 1940. In addition, the growth of the consumer automobile, coupled with the opening of turnpike systems in Pennsylvania and California, enabled greater locational choice for IHE during this time period.

Although the 1930s do not stand out in the literatures, Ben-David (1972) identified the 1930s as a turning point for U.S. higher education. He argued that the 1930s signified the beginnings of a change from the service orientation of universities, especially public IHE, to "liberal undergraduate education and research-oriented graduate education" (Ben-David, 1972: 43). Prior to the 1930s, land-grant IHE were the prototypical public institutions, in which the role of service (i.e., agricultural extension and experimentation) was emphasized over research. However, the Great Depression led to a heightened concern about the connections between education and R&D in both academia and society.
The growing importance of education and training beyond secondary schooling fueled growing enrollments in the 1930s and early 1940s. In addition,

[enrollment increases during the Depression suggest . . . that widespread unemployment makes college seem more attractive. While few families could afford to spend much on their children's education during the thirties, and many badly needed extra income, their children could seldom find paying jobs. Under those circumstances, college evidently made sense to some who would not have chosen it in the twenties (Jencks and Riesman, 1968: 108).

By 1930, one in five adults was attending an institution of higher education (Burke, 1983). According to Foerster (1937: 66), students of this time were motivated primarily by “applause,” (a diploma as a means to economic advantage), “character” (the draw of student activities on campuses), and “utility” (occupational motivation). Fears associated with the Great Depression contributed to growing numbers of and enrollments in two-year IHE (Coffman, 1934).

Therefore, the 1930s encouraged scholars, citizens, and government officials alike to consider the linkages between economic growth and R&D. Moreover, the Great Depression highlighted the need for a federal economic plan that included U.S. IHE (Coffman, 1934) (see Chapter 3, Section 3.3.4.1.). The entrance of the U.S. into WWII in 1941 and the subsequent enactment of G.I. Bill in 1944 formally solidified the role of higher education in the U.S.

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8 The first two-year institution established, Becker College of Leicester, Massachusetts, was founded in 1784, nearly 150 years after Harvard's establishment. According to USDE (1987, 1991) data, Becker College changed from a two-year to a four-year institution between 1986 and 1990. The oldest, continuously-operating two-year institution, Louisburg College in Louisburg, North Carolina, was founded in 1787.
4.4. Expansion and diversification: higher education between 1941 and 1999

Nearly 42 percent (2,221 IHE) of the 5,339 IHE open in 2007 were established in the 305 years between the founding of Harvard and 1940 (see Table 4.1.). Approximately 50 percent (2,650 IHE) of the 5,339 IHE open in 2007 were established in the fifty-nine years between 1941 and 1999. On average, 45 new IHE were founded annually between 1941 and 1999 (Table 4.5.). Graphing the number of new IHE established annually between 1941 and 1999 highlights the comparatively short time frame in which nearly half of all IHE open in 2007 were founded (Figure 4.7.). In comparison, the mean founding rate for the entire pre-1941 period was approximately 7 IHE per year. The mean number of IHE established per year in the post-WWII era peaked between 1957 and 1969, when an average of 82 IHE per year were founded. The height of post-WWII institutional founding occurred in 1965, when 150 new IHE were established.

Table 4.5.: IHE established, by era, 1941-1999

<table>
<thead>
<tr>
<th>Era</th>
<th>Dates</th>
<th>New IHE established</th>
<th>Number of years in era</th>
<th>Mean number of IHE established by year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1941-1999</td>
<td>1941-1956</td>
<td>464</td>
<td>16</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>1957-1969</td>
<td>1,070</td>
<td>13</td>
<td>82</td>
</tr>
<tr>
<td></td>
<td>1970-1999</td>
<td>1,116</td>
<td>30</td>
<td>37</td>
</tr>
<tr>
<td>TOTALS</td>
<td></td>
<td>2,650</td>
<td>59</td>
<td>45</td>
</tr>
</tbody>
</table>

Source: Calculations derived from author's database. See Chapter 2, Section 2.3. for sources.
Figure 4.7: New IHE established, by year, 1941-1999
Note: Trend line reflects running mean using 5-year intervals.
Source: Data derived from author's database. See Chapter 2, Section 2.3, for sources.
In terms of geography, every state gained at least five new IHE between 1941 and 1999 (Figure 4.8.). Strong patterns of new institution founding continued in areas of steady population growth. California gained the most IHE during this period, with 289 new IHE established between 1941 and 1999. Up until the mid-twentieth century, distance hindered enrollment in IHE (c.f., McConnell, 1965; Kariel, 1968). The effects of distance decay decreased after WWII, as the interstate highway and commercial aviation systems eased transportation across the country. However, students make enrollment decisions not only based on their interests, but also on the selectivity of different types of IHE (c.f., Warntz, 1963; Section 4.4.4.).

... [S]tudents tend to move a shorter distance to attend a state-supported institution than a privately endowed one, farther than both to attend a national or “prestige” school, and farther still to obtain a graduate degree (Schofer, 1975: 230).

Chapters 5 and 6 analyze the geographic patterns of IHE and enrollment after WWII at the national, state, and point levels.

Just as the total number of IHE rose dramatically during the post-WWII era, so too did the number of students enrolled in IHE increase appreciably (Table 4.6.). Enrollment in IHE reached one million students between the 1919-20 and 1929-30 academic years (USDE, 2000). During the 1949-50 academic year, enrollment in IHE surpassed 2.6 million students. U.S. higher education was in existence for nearly 300 years (i.e., between 1636 and 1929) before enrollment reached 1.1 million students, yet it took fewer than 21 years (i.e., between 1929 and 1949) for higher education to grow by an additional one million students. Between 1939 and 1999, enrollment in IHE increased by 13.3 million students, or 890 percent. In addition, after WWII, the composition of students enrolled in U.S. IHE changed dramatically (c.f., Menand, 2001; see Chapter 6, Sections 6.2.3. and 6.2.4. for analyses across sex and ethnicity of students).
Figure 4.8: Locations of new IHE, 1941-1999
Total number of IHE established = 2,650.
Source: Mapped using current zip codes and state boundaries. Data derived from author’s database. See Chapter 2, Section 2.3. for sources.
There were key changes in the expansion of U.S. higher education between 1941 and 1999. Not only did the numbers of IHE and students increase, but the size of IHE grew as well (Section 4.4.1.). The G.I. Bills were influential in shaping higher education in the post-WWII era (Section 4.4.2.). In addition, there was greater diversification across institutional type during the 1941 to 1999 period. Two-year IHE (Section 4.4.3.), research universities (Section 4.4.4.), and private, for-profit IHE (Section 4.4.5.) all experienced marked growth during this era. In contrast, the role of the small, private, non-profit IHE declined during this period (Section 4.4.5.).

Table 4.6.: Enrollment in IHE, 1929-1999

<table>
<thead>
<tr>
<th>Year</th>
<th>Students</th>
<th>Percent change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1929</td>
<td>1,100,737</td>
<td></td>
</tr>
<tr>
<td>1939</td>
<td>1,494,203</td>
<td>35.7</td>
</tr>
<tr>
<td>1949</td>
<td>2,659,021</td>
<td>78.0</td>
</tr>
<tr>
<td>1959</td>
<td>3,639,847</td>
<td>36.9</td>
</tr>
<tr>
<td>1969</td>
<td>8,004,660</td>
<td>119.9</td>
</tr>
<tr>
<td>1979</td>
<td>11,569,899</td>
<td>44.5</td>
</tr>
<tr>
<td>1989</td>
<td>13,538,560</td>
<td>17.0</td>
</tr>
<tr>
<td>1999</td>
<td>14,791,224</td>
<td>9.3</td>
</tr>
</tbody>
</table>

4.4.1. The increased size of IHE

An important component of enrollment change in the era between 1941 and 1999 was the increasing size of IHE. The total number of IHE enrolling more than 2,500 students rose considerably after WWII. The most marked change in the mean size of IHE occurred between 1960 and 1970, when the average enrollment in IHE grew from 1,897 to 3,149 students, a 66 percent increase (Table 4.7.). Mean total enrollment increased 24 percent between 1970 and 1980, and mean average enrollment surpassed 3,900 students per institution by 1980. There was virtually no change in mean average enrollment between 1990 and 2000.

<table>
<thead>
<tr>
<th>Year</th>
<th>IHE</th>
<th>State</th>
<th>Total enrollment</th>
<th>Mean size of IHE</th>
<th>Enrollment in the 10 largest IHE as percent of total enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1939</td>
<td>New York University</td>
<td>NY</td>
<td>47,771</td>
<td>1,045</td>
<td>16.1</td>
</tr>
<tr>
<td>1949</td>
<td>New York University</td>
<td>NY</td>
<td>47,936</td>
<td>1,443</td>
<td>11.9</td>
</tr>
<tr>
<td>1960</td>
<td>University of California-All campuses</td>
<td>CA</td>
<td>49,057</td>
<td>1,897</td>
<td>8.8</td>
</tr>
<tr>
<td>1970</td>
<td>University of Minnesota-Twin Cities</td>
<td>MN</td>
<td>60,852</td>
<td>3,149</td>
<td>5.1</td>
</tr>
<tr>
<td>1980</td>
<td>University of Minnesota-Twin Cities</td>
<td>MN</td>
<td>65,293</td>
<td>3,904</td>
<td>3.9</td>
</tr>
<tr>
<td>1990</td>
<td>University of Minnesota-Twin Cities</td>
<td>MN</td>
<td>57,168</td>
<td>3,638</td>
<td>3.5</td>
</tr>
<tr>
<td>2000</td>
<td>The University of Texas at Austin</td>
<td>TX</td>
<td>49,996</td>
<td>3,639</td>
<td>3.1</td>
</tr>
<tr>
<td>2007</td>
<td>University of Phoenix-Online Campus</td>
<td>AZ</td>
<td>224,880</td>
<td>3,956</td>
<td>4.0</td>
</tr>
</tbody>
</table>

Source: Calculations derived from author’s database. See Chapter 2, Section 2.3, for sources.
As the mean size of IHE increased after 1960, the size of the largest IHE grew as well. In 1939, the largest single campus, New York University, had 47,771 students. The size of the largest campus grew until 1980, when total enrollment at a single campus peaked; in that year, more than 65,000 students were enrolled at the University of Minnesota, Twin Cities campus. After 1980, the size of the largest campus in the nation declined until 2007, when the University of Phoenix Online Campus soared to 224,880 students (see Section 4.5.).

As the size of the largest IHE in the nation fluctuated, enrollment at the largest ten IHE as a proportion of total enrollment in the nation decreased. In 1939, the ten largest IHE accounted for 16 percent of total enrollment; by 1990, the ten largest IHE accounted for only 3 percent of total enrollment. The decline in the share of total enrollment accounted for by the ten largest IHE may be explained by two factors. Firstly, as the total number of IHE in the nation increased, the overall share of enrollment accounted for by the ten largest schools decreased. Secondly, even though the relative share of the largest ten IHE was declining, the number of large IHE was increasing markedly. There were 26 IHE with more than 10,000 students in 1939. By 1960, there were 73 IHE with more than 10,000 students. The so-called massification of higher education between 1960 and 1970 dramatically increased the overall size of IHE (Thomas and Chickering, 1983). By 1970, there were more than 200 IHE with greater than 10,000 students. In 1980, 11 percent (338 IHE) of all IHE had enrollments greater than 10,000 students.

While the mean sizes of all types of IHE increased after WWII, not all types grew at equal rates. Mean enrollments in four-year IHE were larger than mean enrollments in both two-year and all IHE. In 1939, mean enrollment in four-year IHE was nearly four times greater than mean enrollment in two-year IHE. By 1980, the difference in mean enrollment between four- and two-year IHE was only 82 students. Even though the sizes of four- and
two-year IHE converged by 1980, four-year IHE were better represented among the ten largest campuses of IHE. Only one two-year IHE—Miami-Dade Community College—appeared among the ten largest IHE between 1939 and 1990; Miami-Dade Community College had the third largest enrollment in 1990. The dominance of four-year IHE among the largest campus locations is not surprising, given that four-year IHE typically offer students a residential experience and, thus, draw students from a larger catchment area. Two-year IHE tend to be smaller, since they usually draw students from within a commutable distance of the institution.

The period between 1941 and 1999 also signaled key changes in institutional control of the largest IHE.

As public facilities for higher education were expanded, especially in urban communities, enrollment in private colleges and universities began to decline. . . . This enrollment decline began in 1969 and had become noticeable indeed by 1972 (Millett, 1974: 82).

In 1939, four of the ten largest IHE were private, non-profit: New York University, Columbia University, Northwestern University, and the University of Southern California. Two of these private, non-profit IHE—New York University and Columbia University—were the largest two IHE in the nation in 1939. By 1970, Northeastern University in Massachusetts was the only private, non-profit IHE to appear among the ten largest campuses. Between 1980 and 2000, the ten largest IHE in the nation all were public IHE.

4.4.2. The influence of the G.I. Bills

During the Great Depression, there were discussions about the costs of and inequality in higher education and training (see Chapter 3, Section 3.3.4.). When the U.S. entered WWII in December 1941, plans were being formulated to assist veterans in demobilization. Concerns about a possible post-WWII economic recession contributed to the enactment of
the most extensive demobilization legislation in U.S. history: the 1944 G.I. Bill of Rights (see Chapter 3, Section 3.3.4.1.). The educational component of the G.I. Bill—which provided funding to veterans to attend the college or university of their choice—impacted IHE and enrollments significantly.

A total of 464 new IHE were established between 1941 and 1956, when G.I. Bill benefits ended for WWII veterans (see Table 4.5.). The peak of institutional establishment between 1941 and 1956 occurred in 1946, when 73 IHE were founded. As the founding rate for new IHE rose after between 1941 and 1956, enrollment in IHE increased as well. Nearly 1.5 million students attended U.S. IHE in 1939 (see Table 4.6.). Total enrollment in IHE surpassed 2.6 million by 1949, due, in large part to the influx of WWII veterans into IHE. More than 1 million WWII veterans were enrolled in IHE in both 1946 and 1947 (see Table 3.3.). By 1952, Korean War veterans were beginning to use their G.I. Bill benefits as well. Enrollment in U.S. IHE exceeded 3.6 million by 1959 (USDE, Institute of Education Sciences, National Center for Education Statistics, 2005).

Just as the WWII and Korean War G.I. Bills democratized the financial and academic accessibility of IHE for veterans, the G.I. Bills also paved the way for greater access to higher education for civilians. In particular, the veteran influx to IHE encouraged the founding of new IHE and new types of IHE. In both 1939 and 1949, four-year IHE accounted for 81 percent of all IHE (see Table 5.2.). While four-year IHE were numerically dominant between 1941 and 1956, the role of two-year IHE was increasing in the higher education arena. Two-year IHE accounted for nearly 43 percent of all new IHE established between 1941 and 1956. Private, non-profit, four-year IHE comprised the largest single sector of new foundings, at 40 percent. The second-largest sector of new IHE was public, two-year IHE (26 percent). As the diversity of institutional types increased between 1941 and 1956,
the geographic accessibility of higher education grew as well. New IHE were established in all states except Delaware between 1941 and 1956.

Concurrently, the role of states in higher education became more prominent in two ways. Firstly, the foci of public IHE changed after WWII. The motivations of state-sponsored (i.e., public) IHE prior to WWII centered on education for democratic, egalitarian, and service-oriented purposes (Foerster, 1937). For instance, public, land-grant IHE emphasized the training of students to serve society in practical realms: as teachers, as engineers, and as agriculturalists. After WWII, state IHE began to emphasize undergraduate and graduate education more broadly, and their ability to compete with private, non-profit IHE rose.

Secondly, the geographic and social accessibility of public IHE appealed to many veterans, and the entrance of large numbers of veterans to state IHE symbolized the beginnings of U.S. mass higher education. While veterans enrolled in all types of IHE in large numbers, not all institutions or administrators were receptive to the ideas of educating the masses. James B. Conant, Harvard’s President between 1933 and 1953, assisted in the writing of the educational clause of the 1944 G.I. Bill, yet he expressed concerns about mass education eroding the quality of U.S. higher education (Conant, 1947). Conant and others contended

[it was bad enough that the nation’s universities swarmed with thousands of GI’s, but to sustain these conditions for one day longer than necessary was intolerable. An alternative to a four-year program had to be made available. If not, the quality of higher education would deteriorate. Ideally, community colleges would function to keep out those students who would not profit from a four-year program, while at the same time satisfying their demands for some type of postsecondary training (Hylander, 1986: 136).
As states implemented two-year college systems, a dichotomy arose in U.S. higher education. Specifically, states began emphasizing both two-year and research-intensive IHE, and a new era of U.S. higher education emerged in the late 1950s and into the 1960s.

4.4.3. The rise of the two-year college

The origins of the mass education movement in the U.S. formally began when, in 1946, President Harry S. Truman commissioned a study "of the social role, objectives, methods, and facilities of higher education" (Guyotte, 1980: 229). A major recommendation of The President's Commission on Higher Education (1948: 67) was that "the number of community colleges be increased and that their activities be multiplied." The ideas surrounding the widespread establishment of public, two-year IHE to educate the masses elicited some controversy. While supporters of The President’s Commission agreed that a college degree improved social and personal mobility, opponents of two-year IHE were concerned over "who should go to college, what institutions students should attend, and who should pay the bills" (Guyotte, 1980: 243). The debates over two-year IHE continued into the 1960s. For example, in their study of U.S. higher education history, Jencks and Riesman (1968: 480) referred to two-year IHE as a type of “anti-university colleges.” Other scholars have lamented the lack of scholarly inquiry into two-year IHE (Cohen and Brawer, 1989; Townsend, 2004). Despite the differing viewpoints regarding their functions, roles, and contributions, two-year IHE clearly made a profound impact in post-WWII higher education beginning in the late 1950s.

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In the 1940s (Stoddard, 1944), California’s system of two-year IHE became the “model for other states” (Andrews and Fonseca, 1998: 1). The California Master Plan (c.f., The Master Plan Survey Team, 1960; Goldin and Katz, 2008; Callan, 2012) helped solidify California’s desire to develop a diverse system of higher education, across all LEVELS and CONTROLS (see Chapter 5). California’s influence in the two-year college arena has been notable for its leadership (Cohen and Brawer, 1989), proliferation (Budros, 1996), and organization (Richards, et al., 1969). Overall, states in the western U.S. moved more rapidly than their eastern counterparts in creating and expanding mass education (Boli, et al., 1985).

In terms of institutional mission, the two-year IHE founded in the 1950s and 1960s attempted to be all things to all people (Boorstin, 1966; Kerr, 1971). However, it is generally agreed that two-year IHE established during this era had four primary roles (adapted from Medsker and Tillery, 1971):

1. to provide traditional undergraduate studies for those students planning to go to four-year IHE (e.g., college preparatory studies),
2. to provide career training both for adults and for those students not planning on attending four-year IHE,
3. to provide continuing education in both general and occupational categories, and
4. to serve their local community intellectually and culturally.

Two-year IHE founded in the late 1950s and into the 1960s promoted open admissions (i.e., academic accessibility), low cost tuition (i.e., economic accessibility), and convenience (i.e., spatial accessibility).

Not only were the functions of two-year IHE diverse, but the types of students enrolled in two-year IHE varied markedly as well. There was heterogeneity in the ages and
socioeconomic backgrounds of students enrolled in two-year IHE during the 1950s and 1960s. Moreover, two-year students’ motivations and interests in higher education were shown to be highly divergent (Dressel, 1956).

These students fall into four principal groups: those who do not want to go away to college; those who cannot afford to do so; those whose high school record bars them from a four-year college, or at least the public ones in their home state; and those who want less than four years of higher education (Jencks and Riesman, 1968: 484-485).

Several studies of the characteristics of students enrolled in two-year IHE were conducted in the late 1960s; these studies expand upon Jencks and Riesman’s (1968) assertions. Firstly, The American College Testing Program (1969) found that students in two-year IHE tended to enroll directly after high school. Secondly, Richards and Braskamp (1969) discovered that students were inclined to enroll in two-year IHE out of practical considerations for career and technical training rather than intellectual reasons. Thirdly, Richards and Braskamp (1969) determined that two-year IHE did a good job of serving the demands and characteristics of their students.

While the broad purposes of two-year IHE supply both academic and economic accessibility to students enrolled in these institutions, the local nature of two-year IHE provide geographic accessibility for students as well. In the late 1950s and into the 1960s, enrollment in two-year IHE soared, and new two-year IHE opened in all states except Mississippi between 1957 and 1969. However, the distribution of two-year IHE across the nation was uneven during this decade.

Seven states accounted for more than a third of all public two-year colleges and more than two-thirds of the enrollment in such institutions: California, New York, Illinois, Michigan, Florida, Texas, and Washington (Andrews and Fonseca, 1998: 2).

Richards, et al. (1969) found distinct regional differences in the characteristics of two-year IHE in the 1960s (see Chapter 5). In particular, Richards, et al. (1969: 37) determined that
states in the Great Lakes (i.e., Midwest) and Far West (i.e., West) regions “sought an identity of their own, rather than imitating private liberal arts colleges.” By the early 1970s, it was estimated that approximately 82 percent of all eighteen- to twenty-four year-olds living in urban areas resided within commuting distance of a public, two-year institution (Medsker and Tillery, 1971).

The rise of the two-year college during the late 1950s and into the 1960s significantly expanded the geography, enrollment, and functions of higher education. Two influential societal forces contributed to the rise of two-year IHE during this decade. Firstly, changes in the economy associated with the third industrial revolution heightened the importance of postsecondary education (see Chapter 3, Section 3.2.). Changing workforce requirements necessitated a greater diversity of higher education structures and institutional types. The two-year college appealed to a broad range of students in a broad range of geographic locales. Moreover, the lower relative cost of establishing a two-year versus a four-year institution enabled the rapid proliferation of two-year IHE (Callan, 1997). “At the height of the expansion, between 1965 and 1972, new community college campuses were opening in the United States at the rate of one every week” (Menand, 2001: 44).

Secondly, two forces contributed to dramatic increases in enrollments at all types of IHE. Specifically, the baby boomers reached college-age in the 1960s (see Chapter 3, Section 3.5.2.). In addition, the G.I. Bill funded more than 1.5 million Vietnam War veterans in the 1960s and early 1970s (see Table 3.4.). Because not all persons of college-age could attend four-year IHE for a variety of social, academic, financial, or geographic reasons, a growing demand for two-year IHE emerged. As the place of two-year IHE in U.S. higher education grew, a decidedly different type of institution—the research university—gained prominence as well.
4.4.4. The evolution of the research university

Academic, economic, and geographic accessibility played key roles in the success of the two-year college in the post-WWII era. Research universities—IHE which "conduct about half of the basic research in the United States, train almost all the Ph.Ds and medical doctors, and also graduate about 30 percent of the country's bachelor's" (Geiger, 2004: xix)—are the antithesis of two-year colleges. Unlike their two-year counterparts, research universities tend to be selective academically, restrictive economically, and expansive geographically.\(^\text{10}\) Moreover, in contrast to the relatively recent two-year college surge, most research universities were established prior to 1900. Despite their relatively long history as an institutional type, there were key changes in the emphases, clientele, and geography of U.S. research universities after WWII and during the 1960s in particular.

In the immediate post-WWII period, just as The President's Commission on Higher Education (1948) recommended the expansion of two-year higher education in the U.S., so too did the Commission advocate change in two areas central to research universities: graduate education and research programs. Graduate education programs first emerged in the U.S. during the mid-1800s; Yale University awarded the first Ph.D. in 1861, and The Johns Hopkins University opened in 1876 with a commitment to research (Council of State Governments, 1952). However, graduate education in the U.S. retained some degree of anonymity through WWII.

\(^\text{10}\) This dissertation does not attempt to compete with the expansive literature on the origins, expansion, and role of U.S. research universities. For more detailed inquiries, see Geiger (1986, 2004), Gumport (1990), Feller (1995, 1998a, 1998b), Graham and Diamond (1997), Noll (1998), and National Research Council (2012).
Graduate education is the least understood activity in American education. Perhaps this results from the relatively small number of persons concerned with it. Yet, the graduate school is the apex of the university, the last of the progressively selective levels of higher education, and its students are the most advanced on the campus (The President's Commission on Higher Education, 1948: 84).

The President's Commission on Higher Education (1948) advocated the growth of graduate education through continued emphases on research, expanded professional training, and focused professorial training. The large baby boom cohort, coupled with Korean and Vietnam War veterans using G.I. Bill funds to attend IHE, translated into an influx of graduate students at four-year IHE in the 1950s and 1960s. Fewer than 1,000 doctoral degrees were awarded annually before the Great Depression (USDE, Institute of Education Sciences, National Center for Education Statistics, 2005). In contrast, more than 10,000 doctoral degrees were awarded during the 1960-61 academic year (USDE, Institute of Education Sciences, National Center for Education Statistics, 2005). Production of doctoral degrees more than tripled during the 1960s; more than 32,000 doctoral degrees were awarded during the 1970-71 academic year (USDE, Institute of Education Sciences, National Center for Education Statistics, 2005). Growth in the number of doctoral degrees slowed after the 1960s. During the 2006-2007 academic year, approximately 63,000 doctoral degrees were awarded (USDE, 2011).

Just as graduate education expanded in the 1960s, so too did academic research increase during the decade as well. The importance of academic research in graduate study was well-established by 1890 (Veysey, 1965). World Wars I and II stimulated R&D at IHE through efforts of “fact-finding and investigation” (Council of State Governments, 1952: 48). However, “activity in research was then confined very largely to the universities; industry and government had not yet entered the field to any marked degree” (The President's Commission on Higher Education, 1948: 86). The President's Commission on Higher
Education (1948) was instrumental in advocating an increased role for federal- and state-level funding for higher education research. Moreover, the Commission (1948) recommended that research programs in IHE be expanded to include social sciences research.

After WWII, federal funding for R&D at IHE grew considerably (see Chapter 3, Section 3.3.3.). In particular, the U.S. response to the Soviet Union's launch of the Sputnik satellite in 1957 produced a "massive infusion of federal funds into higher education" (Handlin and Handlin, 1970: 84). Federal appropriations for higher education R&D more than doubled between 1952 and 1964 (The Carnegie Council on Policy Studies in Higher Education, 1975).

The allocation of federal funds for university research simultaneously fueled the dramatic expansion of doctoral education programs through the 1960s, since federal funds explicitly linked advancing scientific knowledge with the training of research personnel (Gumport, 1990: 315).

As federal funds for research at IHE grew, the number of research universities increased as well. Before WWII, there were approximately 40 research universities in the U.S. (Kerr, 1994). The number of research universities more than doubled between 1940 and 1970. In 1970, there were 92 Research Universities I and II, according to The Carnegie Foundation for the Advancement of Teaching (1987). In 2009, The Carnegie Foundation for the Advancement of Teaching classified 207 Research Universities with "very high" or "high"

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11 The Carnegie Foundation for the Advancement of Teaching classifications of IHE have been updated numerous times since the classification's original publication in 1973 (c.f., The Carnegie Foundation for the Advancement of Teaching, 1997). In 2005, major changes to the classification system were released. Participation in the new classification system is voluntary, and there are multiple, parallel classifications for individual IHE (c.f., McCormick, 2005; McCormick and Zhao, 2005; The Carnegie Foundation for the Advancement of Teaching, 2009).
As the number of research universities grew, so too did the diversity of these IHE increase. Prior to the Great Depression, research activities were concentrated at private, non-profit, four-year IHE (Cowley and Williams, 1991). By 1987, public IHE accounted for more than two-thirds (68 percent) of Research Universities I and II (The Carnegie Foundation for the Advancement of Teaching, 1987).

Just as the academic emphases and institutional characteristics of research universities differ markedly from two-year colleges, so too is the geography of research universities unique. Research universities are global in scale, meaning that they draw students from an expansive, often international, geographic area. In their examination of private IHE, Lowe and Viterito (1989) found that the most selective private IHE in the nation had the broadest base of appeal, both in terms of the students who attend these institutions and the faculty who teach there. The diversified interests of large, research-intensive, private, non-profit IHE helped them to fare better than their smaller, liberal arts counterparts (see Section 4.4.6.). In addition, after 1980, there was an increased elitism in higher education which "increased segregation of students by ability level" (Geiger and Heller, 2011: 10). Private, non-profit and public research universities and larger, prestigious liberal arts IHE benefitted from the increased selectivity movement (c.f., Hoxby, 2009; Geiger and Heller, 2011). The selectivity of research-level IHE, coupled with their missions in graduate education and research, increases the geographic scope of these IHE (c.f., Warntz, 1963; Schofer, 1975).

The expansive geographic scope, distinctive student clientele, and focused institutional emphases combine to make research universities a distinctive institutional type. However, the numbers of research universities within the different Carnegie Foundation for the Advancement of Teaching classifications may not be directly comparable. However, noting the increase in the number of research universities over time does indicate growth in this sector of institution.
cutbacks in both federal research funding and state funding for higher education since the 1980s have threatened the standing and security of U.S. research universities (National Research Council, 2012). As research universities began to face challenges, a new player in the higher education marketplace emerged: the private, for-profit institution.

4.4.5. The rise of the private, for-profit institution

Public and private, non-profit IHE comprised more than 99 percent of all IHE through 1970 (see Table 5.3.). The first private, for-profit college, Duffs Business Institute (now named the Everest Institute), was established in 1840 in Pittsburgh. As their name implies, private, for-profit IHE "[s]hares . . . can be bought and sold and earnings are subject to taxation" (Hentschke, 2003: 1). The nation’s largest private, for-profit IHE—the University of Phoenix—was established in Phoenix in 1976. By 1980, this relatively new type of institution was gaining momentum.

Even though private, for-profit IHE represent a comparatively small element within U.S. higher education, the unique functions, clientele, and geography of these IHE merit their

13 Less-than-two-year IHE comprise the majority of private, for-profit institutions in the U.S. (Kokalis, 1982). Since less-than-two-year IHE are beyond the scope this research (see Chapter 2, Section 2.2.2., the treatment of private, for-profit institutions within the dissertation focuses only on two- and four-year private, for-profit IHE.

14 Ruch (2001) argues that private, for-profit higher education began in the U.S. as early as the 1660s. Ruch (2001) asserts that the USDE under-counts private, for-profit IHE since the USDE databases of two- and four-year IHE include only those IHE which are accredited by a recognized organization.

15 The accreditation of private, for-profit IHE is not without controversy. For example, the University of Phoenix was established in Phoenix in 1976 and accredited in 1978 under the North Central Association of Colleges and Schools Commission on Institutions of Higher Education (NCACHE) (see Appendix A). As other branches of the University of Phoenix have been established, they have been accredited under the umbrella of the Phoenix location. In the words of Strosnider (1997: A32), "[a]s the institution has grown, it has stretched the idea of regional accreditation."
analysis as a separate institutional classification. In particular, private, for-profit IHE focus on providing vocational education, skills training, job placement, and/or career advancement (c.f., Strosnider, 1997; Geiger and Heller, 2011). The three largest providers of private, for-profit higher education are the Apollo Group, Inc. (i.e., the University of Phoenix), DeVry, Inc. (i.e., DeVry Institute of Technology), and ITT Educational Services, Inc. (i.e., ITT Technical Institute) (c.f., Strosnider, 1998; Pusser, 2002; Geiger and Heller, 2011). Holdings of the Apollo Group and ITT Educational Services include both two- and four-year IHE, while DeVry only includes four-year IHE (Strosnider, 1998). While the three largest providers represent the “chains” (Deming, et al., 2011: 2), there also are smaller “independent” providers of private, for-profit higher education as well.

After 1980, the numbers of private, for-profit IHE and students increased markedly. In 1980, private, for-profit IHE accounted for 4 percent of all IHE (see Table 5.3.). Between 1980 and 1990, the number of private, for-profit IHE nearly tripled. By 2000, the proportion of private, for-profit IHE had grown to 17 percent of all IHE. During the 1980s and 1990s, two-year IHE accounted for the majority of accredited private, for-profit IHE. By 1990, there were more than five times more two-year, private, for-profit IHE than four-year, private, for-profit IHE. By 2000, the gap between two- and four-year, private, for-profit IHE dropped slightly to a 2.5 to 1 margin.

In terms of enrollment, total enrollment in private, for-profit IHE accounted for less than 1 percent of total enrollment between 1939 and 1980 (see Table 6.3.). In the 1970s and 1980s, the proportions of enrollment in private, for-profit IHE were similar for both four- and two-year IHE, even though there were markedly more two-year than four-year private, for-profit IHE. In 1990, enrollment in two-year private, for-profit IHE surpassed one percent of total enrollment in U.S. higher education. By 2000, private, for-profit IHE
were the fastest growing sector in U.S. higher education (c.f., Deming, et al., 2011; Geiger and Heller, 2011; Table 5.3.; Section 4.5.).

In terms of students, private, for-profit IHE typically serve a different audience than do either public or private, non-profit IHE. Private, for-profit IHE tend to cater to older and minority students with lower incomes (Deming, et al., 2011). The costs of attending private, for-profit IHE generally often are considerably higher than those of public, two-year IHE (Strosnider, 1998). However, tuition and fees at private, for-profit IHE typically are less than those expenses at private, non-profit IHE (Ruch, 2001). Student loan default rates have been high for private, for-profit IHE (Deming, et al., 2011).

Just as the student clientele and institutional characteristics of private, for-profit IHE differ from either public or from private, non-profit IHE, so too does the geography of private, for-profit IHE vary from more traditional institutional types. In contrast to the public, two-year college model of giving back intellectually and culturally to the local community (Medsker and Tillery, 1971), private, for-profit, two-year IHE operate more as franchises. “Individual campuses tend to be small in size, as compared to traditional colleges and universities, and are often embedded within shopping malls and office parks” (Hentschke, 2003: 1). The enormous scale of some private, for-profit online programs (i.e., the University of Phoenix Online Campus) does little to foster a sense of place either within or outside the institution. Moreover, since private, for-profit IHE typically do not offer a residential campus setting, the physical form of private, for-profit IHE seems less permanent than either public or private, non-profit IHE. In fact, the seemingly prototypical institutional type—the small, private, non-profit, residential college—has faced many challenges since the 1980s.
4.4.6. The decline of the small, private, non-profit, four-year college

As the presence of private, for-profit IHE was increasing in the U.S. higher education arena, the role of private, non-profit IHE was declining. The history of private higher education in the U.S. began in 1819, with the passage of the Dartmouth College Case, which contributed to the proliferation of private, non-profit, four-year IHE between 1820 and 1861 (see Section 4.2.3.). In fact, private, non-profit, four-year IHE comprised nearly three-fourths (252 IHE) of all IHE established between 1820 and 1861. The spread of private, non-profit, IHE slowed after the passage of the Morrill Act in 1862, however. In particular, founding rates for private, non-profit, IHE declined, and the relative share of private, non-profit, IHE compared to all IHE decreased as well (see Table 5.3.). This trend accelerated after the 1960s; between 1960 and 2007, private, non-profit IHE declined from 61 percent of all IHE to 37 percent of all IHE, respectively.

However, not all private, non-profit IHE faced the same challenges. Large and/or selective private, non-profit IHE fared better than their smaller counterparts (see Section 4.4.4.). Small institutions [i.e., IHE enrolling fewer than 2,500 students (Astin and Lee, 1972)], comprise the majority of private, non-profit, four-year IHE.

In size, structure, and environment, they—more than any other educational institution—probably resemble the public's impression of the "typical" American college as depicted by movies and television. But, individually, they are the least-known colleges nationally and many of them are fighting desperately for survival (Kerr, 1972: xi).

In 1939, small IHE accounted for nearly 95 percent of all private, non-profit, four-year IHE (Table 4.8.).

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16 Four-year, private, non-profit comprised at least 86 percent of all private, non-profit IHE between 1939 and 2007. Two-year, private, non-profit IHE historically have represented a less common form of private, non-profit higher education.
Table 4.8: Percent of four-year, private, non-profit IHE, by size of institution, 1939-2007

<table>
<thead>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 2,500</td>
<td>94.7</td>
<td>91.9</td>
<td>91.1</td>
<td>87.2</td>
<td>83.0</td>
<td>82.3</td>
<td>78.3</td>
<td>74.0</td>
</tr>
<tr>
<td>2,000 - 4,999</td>
<td>2.6</td>
<td>3.9</td>
<td>3.6</td>
<td>6.6</td>
<td>9.4</td>
<td>9.9</td>
<td>12.9</td>
<td>15.6</td>
</tr>
<tr>
<td>5,000 - 9,999</td>
<td>1.4</td>
<td>2.8</td>
<td>3.5</td>
<td>4.1</td>
<td>4.8</td>
<td>5.0</td>
<td>5.7</td>
<td>6.3</td>
</tr>
<tr>
<td>More than 9,999</td>
<td>1.2</td>
<td>1.4</td>
<td>1.8</td>
<td>2.1</td>
<td>2.8</td>
<td>2.8</td>
<td>3.1</td>
<td>4.0</td>
</tr>
</tbody>
</table>

Source: Calculations derived from author’s data base. See Chapter 2, Section 2.3. for sources.

Private, non-profit, four-year IHE grew in size, as did their public and two-year counterparts, after WWII (see Section 4.4.1.). However, small IHE still accounted for the majority (74 percent) of private, non-profit, four-year IHE by 2007.

Just as the small size of private, non-profit, four-year IHE limits their visibility, so too do the characteristics of these IHE restrict their options for appealing to both students and donors. For instance, many of the IHE founded during the period between 1820 and 1861 were small colleges with religious affiliations. In addition, many of these small, private, non-profit IHE are part of a group of institutions known as liberal arts colleges, IHE which emphasize diverse curricula and baccalaureate education in a residential campus setting (Breneman, 1990; Cejda and Duemer, 2000). As a group, these IHE “are not selective in their admissions and they serve a discrete geographic region” (Hartley, 2003: 77). The combination of isolated geography, limited missions, and small sizes of many private, non-profit, four-year IHE prompted Astin and Lee (1972) to name this group of institutions the
“invisible colleges.” Astin and Lee (1972: 2) argue that this descriptive term “helps to focus attention on what is probably the chief problem facing such institutions: their obscurity and the consequent lack of concern for their welfare within the community of higher education.”

During the 1970s, 1980s, and 1990s, three factors contributed to the declining role of these invisible colleges in the U.S. higher education landscape. Firstly, the post-WWII surge in public higher education changed the market for higher education services. As the shares of public, two-year IHE rose considerably after 1970, the proportion of private, non-profit, four-year IHE in relation to all IHE fell appreciably. Even though private, non-profit, four-year IHE declined relative to other institutional types, there was a more marked decrease in private, non-profit, four-year enrollment compared to enrollment in other sectors. Thus, private, non-profit, four-year IHE were unable to capitalize on the changed demand for higher education services after WWII that propelled public, two- and four-year IHE into the forefront of U.S. higher education.

Secondly, the increasing presence of the federal government in U.S. higher education after WWII did not benefit small, private, non-profit IHE in the same ways that it benefitted public IHE. WWII, Korean, and Vietnam War veterans were more likely to use their G.I. Bill funds to attend public, as opposed to smaller, private, non-profit, four-year IHE (e.g., Hyman, 1986). Moreover,

[the explosive demand for college stations since World War II could not be satisfied by the independent institutions. When the student growth problem was largely taken over by the states, the programs everywhere included the same tax subsidy that had always characterized state institutions. This, of course, made it more economical for students to attend the tax-supported community college, state college, or state university than to attend the independent institution (Besse, 1972: 109-110).]

In addition, full funding for veterans to attend IHE ended with the Korean G.I. Bill. Thus, for veterans of the Vietnam War and subsequent military service, G.I. Bill funds went further at
public IHE than at the traditionally more expensive private, non-profit, four-year IHE.

Therefore, thirdly, the rising costs associated with private, non-profit, four-year IHE played a role in the decline of these colleges in the U.S. As mentioned in Chapter 2, the database includes 544 IHE that either were closed or acquired by another IHE between 1939 and 2007 (Table 4.9. and Figure 4.9.). At least one IHE closed or merged in all states, except Delaware and Wyoming, during the study period. In terms of CONTROL, nearly 250 private, non-profit, four-year IHE either closed or merged with other institutions in the U.S. between 1939 and 2007. Private, non-profit, four-year IHE represented 45 percent of all IHE closed between 1939 and 2007.

<table>
<thead>
<tr>
<th>Sector</th>
<th>Number of IHE</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public, four-year</td>
<td>21</td>
<td>3.9</td>
</tr>
<tr>
<td>Private, non-profit, four-year</td>
<td>247</td>
<td>45.4</td>
</tr>
<tr>
<td>Private, for-profit, four-year</td>
<td>7</td>
<td>1.3</td>
</tr>
<tr>
<td>Public, two-year</td>
<td>81</td>
<td>14.9</td>
</tr>
<tr>
<td>Private, non-profit, two-year</td>
<td>119</td>
<td>21.9</td>
</tr>
<tr>
<td>Private, for-profit, two-year</td>
<td>58</td>
<td>10.7</td>
</tr>
<tr>
<td>Sector unknown</td>
<td>11</td>
<td>2.0</td>
</tr>
<tr>
<td>Grand Total</td>
<td>544</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Calculations derived from author’s data base. See Chapter 2, Section 2.3. for sources.
Figure 4.9.: Locations of closed IHE

Source: Mapped using current zip codes and state boundaries. Data derived from author's database. See Chapter 2, Section 2.3. for sources.
Institutions closed because they could not pay their bills (Crissey, 1997), meet the financial standards of accreditation (van der Werf, 2002), or find other institutions with which to merge (van der Werf, 2001). In the late 1990s, small, private, non-profit IHE even feared that distance learning programs would draw students away from continuing education courses at their campuses (Selingo, 1998).

The odds are stacked against private liberal arts colleges, the experts say. “Most of the rising demographic demand generated by Baby Boom 2 [the boomlet] is being absorbed by public universities and community colleges,” said John Nelson, a vice president at Moody’s Investors Service. “The competition from the public sector is a lot more intense.” Fifty years ago, half of college students went to private institutions. Today, less than one-fifth do (Zhao, 2002: A28).

Small, private, non-profit, four-year IHE tend to “have modest endowments and are heavily tuition dependent” (Hartley, 2003: 77). Thus, variations in the enrollments of these institutions stand to have immediate and dramatic impacts on the financial situations of the institutions.

4.5. Globalization and commercialization: higher education in the twenty-first century

Between 1941 and 1999, U.S. higher education faced expansion and diversification (see Section 4.4.). Research universities and two-year IHE gained prominence, albeit in different ways and in different realms. The presence of private, for-profit IHE grew in the higher education marketplace, and the role of the liberal arts college declined. In the period since 1999, some of these trends have continued, and new trends have emerged as well. Between 2000 and 2007, 166 new, accredited IHE were established, at a rate of 21 IHE per year (Figure 4.10., see Table 4.1.).

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17 The time it takes to accredit a new IHE is variable, and could range from a year to a decade. Thus, it is possible that later database additions will indicate a greater number of IHE were established in the 2000 to 2007 period.
Figure 4.10: New IHE established, by year, 2000-2007

Note: Trend line reflects running mean using 5-year intervals.
Source: Data derived from author’s database. See Chapter 2, Section 2.3, for sources.
Whereas new IHE were established in every state during the 1941 to 1999 period (see Figure 4.8.), the early years of the twenty-first century saw a more limited geography of new IHE (Figure 4.11.). Approximately one-third of states did not have any new accredited IHE between 2000 and 2007. Massachusetts was the only New England state (see Table 2.1.) to have new IHE established in this era. California and Florida accounted for 20 percent of all new IHE founded during this period.

In many ways, higher education is like any other industry: as an industrial sector and a service provider, higher education must learn to adapt to changing demands, conditions, and forces, both internally and externally. It is not surprising, therefore, that IHE are facing new challenges in the twenty-first century. In the early years of the twenty-first century, scholars have identified the increased globalization of higher education as a key theme facing higher education in the twenty-first century (c.f., Douglass, et al., 2009; Olds, 2009). Globalization is a set of processes that have made the economy, our society, and our culture more interconnected and interdependent (Armstrong, 2006). The increased role of telecommunications and computing technologies play a key role in the globalization of higher education, both in terms of place-based and virtual learning. The globalization of higher education also includes the expansion of branch campuses and online courses in other countries (Salmi, 2002), a process that some scholars refer to as transnational education (Whitaker, 2004). The expanded "global learning infrastructure" (Twigg, 2002: 86) of U.S. IHE has increased the importance of knowledge and education in human capital (see Chapter 3, Section 3.2.).
Figure 4.11.: Locations of new IHE, 2000-2007
Total number of IHE established = 166.
Source: Mapped using current zip codes and state boundaries. Data derived from author’s database. See Chapter 2, Section 2.3. for sources.
In addition to the globalization of IHE in the twenty-first century, there also have been ongoing changes for IHE and students. Firstly, at the institution level, relatively new players in the higher education marketplace continue to receive greater attention. More than 82 percent of all IHE established between 2000 and 2007 were private, for-profit IHE. The literature about the mission, role, and clientele of for-profit IHE continues to grow (e.g., Berg, 2005; Bleak, 2005; Kinser, 2006; The Carnegie Foundation for Advancement of Teaching, 2011). Strong linkages between the rise of private, for-profit IHE, globalization, and technological innovation have been noted (Morey, 2004). In addition, expanded communications technologies also facilitated the expansion of virtual learning (a.k.a., distance learning, online learning, or e-learning).18 Weiss’, et al. (2006) collection, the International Handbook of Virtual Learning Environments, provides a comprehensive view of the background, applications, and challenges facing virtual learning. The massive size of the University of Phoenix Online Campus is emblematic of the rise of both private, for-profit IHE and online learning (see Table 4.7.).

Secondly, established institution types experienced changes as well after 1999. The role and value of two-year IHE continued to grow in the higher education landscape. Bailey (2008) found that two-year IHE have increased access to higher education. In addition, the value of a two-year degree is high, especially for women entering occupational fields (e.g., nursing) (Bailey, 2008). Marcotte, et al., (2005) discovered that two-year degree increased the annual earnings of workers. However, debates about the missions of two-year IHE persist. Bailey (2008: 27) asserted that two-year IHE effectively serve as a “pipeline” entryway into four-year IHE for many students, yet Brint (2003: 20) suggested that only 15

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18 Distance learning has taken many forms over time, including extension, correspondence, and online courses.
percent of two-year students ultimately receive four-year degrees. Since two-year IHE face pressure from so many interest groups (e.g., legislators, administrators, students, and employers), Bailey (2002) argued that two-year IHE should "focus on improving the services that they already provide" (Bailey, 2002: 73).

While two-year IHE faced obstacles, in part, based on their multiple missions, four-year institutions faced different types of challenges in the 2000s. As IHE race to attract the best students and faculty, institutions are forced to spend heavily on the latest equipment, facilities, and amenities. These pressures are more apparent at four-year, residential campuses than on two-year campuses; these burdens have increased the importance of "more and more thoughtful private fund raising" (Thelin, 2009: no page number). Four-year IHE are faced with the commercialization of higher education (Noble, 1998). The rise of virtual learning in this process has served to devalue the work of professors and make institutions as a whole more vulnerable to critique and interference from administrators and outside forces (Noble, 1998, 2001).

Third, students continued to face obstacles in terms of financing their higher educations and determining the viability of their degrees in the new economy. The cost to attend IHE has been increasing at a rate exceeding the inflation (Neusner, 2002). As Neusner (2002) commented, it is not as if the cost of teaching students is increasing; rather raising tuition and fees for students helps make up for reductions in state appropriations for public IHE and declines in revenues for private IHE (see Chapter 3, Section 3.4.). Consequently, student debt is rising dramatically as students struggle to pay for college (c.f., Hudson, 2002; Martin, 2011; Chapter 3, Section 3.3.4.2.). Concurrently, the value of a college degree in the knowledge economy has been questioned: "experts have estimated that the shelf life of a technical degree today is less than five years" (Twigg, 2002: 80). However, the role of
continuing education is becoming more important for today's college graduates due to globalization and the changing economy (Kodrzycki, 2004), especially since most individuals will change jobs, and even careers, several times over the course of their lives.

4.6. Summary of higher education history

The discussion of higher education history within the chapter emphasizes patterns in the founding, functions, characteristics, and spatial representation of U.S. IHE. The preceding discussion of key eras in U.S. higher education provides an understanding of how the spatial provision of higher education services evolved over time. Before 1862, the spatial extent of higher education was shaped by the nation's population distributions, communication technologies, and transportation modes. The first IHE in the nation, the Colonial colleges, were established in close proximity to navigable rivers, established ports, or major trade centers.

During the Colonial era, higher education was essentially a public-private partnership, as the Colonial IHE were chartered by England and funded, in part, by religious and/or private interests. The Dartmouth College Case of 1819 was pivotal in two principal ways. First, the Dartmouth College Case ended public control and funding of private IHE. Second, the Dartmouth College Case prompted the initial discussion of the public function of IHE. Therefore, while the Dartmouth College Case paved the way for the founding of public IHE, its immediate outcome was to spawn an increase in the number of private, non-profit, often religious, IHE. As changes were occurring in the control of higher education in the nation prior to 1862, the spatial extent of higher education in the nation was expanding as well. By 1861, there were 422 IHE dispersed throughout 40 states and the District of Columbia (see Table 4.1. and Figures 4.2., 4.3., and 4.4.).
Two main factors contributed to even greater geographic dispersion of higher education between 1862 and 1940. First, changing economic conditions increased the importance of a higher education (see Chapter 3, Section 3.2.). Specifically, higher education after 1862 expanded in response to changes in the demand for skilled labor and changes in the capacities of IHE. For example, technological innovation associated with the agricultural and industrial revolutions forever changed the economic structure of the nation and, ultimately, broadened access to advanced educational opportunities. Rapid improvements in transportation and communication technologies during the late nineteenth century and throughout the twentieth century facilitated the geographic expansion of higher education across the country as well. Moreover, significant changes in the labor force associated with industrial restructuring reinforced the importance of increased accessibility to formal educational opportunities beyond secondary schooling. Second, federal forces contributed to the expansion of higher education between 1862 and 1940 (see Chapter 3, Section 3.3.). Two major federal initiatives facilitated the spread of IHE and students throughout the nation. The Morrill Act of 1862 effectively broadened the mission and geographic scope of U.S. higher education, while the G.I. Bill of 1944 provided funding to WWII veterans to attend IHE as a demobilization strategy.

In the period between 1941 and 1999, three factors were instrumental in shaping higher education in the post-WWII era. First, demographics were influential in both enrollment growth and diversity during this period. In the immediate post-WWII period, existing IHE expanded their enrollments and physical infrastructures in order to accommodate the G.I. Bill veteran influx. Enrollment in IHE soared in the mid-1960s, as baby boomers reached college-age.
Second, the changing demand for higher education services stimulated an increase in new institutional founding, particularly with regard to public, two-year IHE. A surge in the establishment of public, two-year IHE during the 1960s and 1970s increased the academic, economic, and spatial accessibility of higher education. The rise of the public, two-year college is particularly notable in the post-WWII spread of U.S. higher education. The diffusion of the public, two-year college was hierarchical in some senses; California and New York City (i.e., the higher order places) had two-year college structures in place by 1960, while other places did not adopt extensive two-year college networks until the 1970s. However, the spread of two-year colleges also was contagious in that virtually every place—urban, suburban, and rural—sought to establish a two-year college that would serve its local population. The two-year college movement contributed to a growing diversity of institutional enrollment across sex, ethnicity, and age that began in the 1970s and continues to the present in all LEVELS of IHE.

Third, shifts in the controlling agents of IHE accompanied changes in the types and numbers of IHE established after WWII. After 1949, the relative share of private, non-profit IHE declined through 2007 (see Table 5.3.). Public IHE increased their presence in the higher education marketplace between 1949 and 1980. By 1980, the number of private, for-profit IHE was increasing notably compared to the early part of the study period. After 1980, private, for-profit IHE were the only CONTROL group that was increasing in its percentage of all IHE. The increased diversity of institutional types by CONTROL is a key component to understanding U.S. IHE since WWII.

It is clear that higher education students and institutions are meeting new, complex challenges in the twenty-first century. Many of the patterns shown in the late twentieth century in terms of demographics and CONTROL are continuing in the twenty-first century.
It is premature to assess whether and how the themes identified here will impact U.S. higher education in the long-term future. It is clear, however, that IHE are facing the unique pressures of dealing with both the marketplace (i.e., the physical structures of the university) and the marketspace (i.e., virtual environments) of higher education (Twigg, 2002). Chapter 4 provided a literature-based view of and spatial introduction to higher education history in the U.S. Next, Chapters 5 and 6 add an analytical component to viewing IHE and enrollment at the nation, state, and point levels for the study period between 1939 and 2007.
Because the United States is such a big country, and particularly because our educational system is uniquely divided into fifty state systems, the topic of higher education—as of education in general—needs to be viewed spatially. Not only does public education differ from state to state, but there is an amazing diversity of private institutions in American higher education that also differ from place to place (Fonseca and Andrews, 1993: 1).

5.1. Introduction

Chapter 4 summarized the origins and history of U.S. higher education between the establishment of Harvard in 1636 through to the twenty-first century. Chapter 5 expands upon those discussions to focus on variations in the numbers of IHE at different spatial scales. Whereas Chapter 4 examined higher education historically using literature review for key eras, Chapter 5 emphasizes spatial patterns using decadal or near-decadal data between 1939 and 2007 from the dissertation database. Within this chapter, findings for IHE are organized by spatial scale of analysis: nation (Section 5.2.), state (Section 5.3.), and point (Section 5.4.). Traditional and spatial statistics are utilized across space and over time. The chapter concludes by discussing the connections between the IHE analyses and the educational, federal, state, and demographic factors identified in Chapter 3.

5.2. Nation-level findings

Identifying patterns in the numbers of IHE at the national level establishes an essential precursor for analyzing variations in IHE at smaller spatial scales (i.e., the state and point level). At the national level, the cumulative number of IHE increased each study year between 1939 and 2007 (Table 5.1.). In 1939, at the start of the study period, there were
1,397 accredited IHE open\(^1\) in the United States. By 1980, the number of IHE had more than doubled to 3,066. Thus, while it took more than 300 years after Harvard’s founding to establish 1,397 IHE, it took approximately 40 years to increase the number of IHE twofold in the U.S.

<table>
<thead>
<tr>
<th>Year</th>
<th>Total IHE</th>
<th>Absolute change</th>
<th>Percent change</th>
<th>18-29 year olds</th>
<th>As a percent of total population</th>
<th>Percent change in 18-29</th>
</tr>
</thead>
<tbody>
<tr>
<td>1939</td>
<td>1,397</td>
<td></td>
<td></td>
<td>27,782,251</td>
<td>21.0</td>
<td></td>
</tr>
<tr>
<td>1949</td>
<td>1,676</td>
<td>279</td>
<td>20.0</td>
<td>28,129,639</td>
<td>18.6</td>
<td>1.3</td>
</tr>
<tr>
<td>1960</td>
<td>1,890</td>
<td>214</td>
<td>12.8</td>
<td>26,449,872</td>
<td>14.7</td>
<td>-6.0</td>
</tr>
<tr>
<td>1970</td>
<td>2,644</td>
<td>754</td>
<td>39.9</td>
<td>36,778,492</td>
<td>18.1</td>
<td>39.0</td>
</tr>
<tr>
<td>1980</td>
<td>3,066</td>
<td>422</td>
<td>16.0</td>
<td>49,389,287</td>
<td>21.8</td>
<td>34.3</td>
</tr>
<tr>
<td>1990</td>
<td>3,832</td>
<td>766</td>
<td>25.0</td>
<td>47,521,190</td>
<td>19.1</td>
<td>-3.8</td>
</tr>
<tr>
<td>2000</td>
<td>4,222</td>
<td>390</td>
<td>10.2</td>
<td>46,524,790</td>
<td>16.5</td>
<td>-2.1</td>
</tr>
<tr>
<td>2007</td>
<td>4,656</td>
<td>434</td>
<td>10.3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sources: \(^1\) Calculations derived from author’s data base. See Chapter 2, Section 2.3, for sources. \(^2\) Population data are for decade years from the Minnesota Population Center (2004).

\(^1\) In Chapters 5 and 6, only those IHE which reported enrollment in the study years (i.e., 1939, 1949, 1960, 1970, 1980, 1990, 2000, and 2007) are enumerated. Specifically, IHE which did not report enrollment are not included in the number of IHE for that year. There are two reasons why enrollment data may not exist for IHE in every year since their establishment. Firstly, there are lags between the time an institution is established and the time students are enrolled at the institution. Secondly, there is an acknowledged lag between an institution’s establishment date and its accreditation date (Georges, 1971). The USDE collects data only for accredited IHE. Thus, enrollment data only will be available for accredited IHE (see Chapter 2, Section 2.2.2, for a discussion of accreditation).
Between 1939 and 2007, there were three periods of strong growth in the number of IHE between intervals/decades (see Table 5.1. and Figure 4.7.). Variations in the establishment of new\(^2\) IHE during the study period may be linked to key educational, federal, state, and demographic factors (see Chapter 3).

Firstly, there was a 20 percent increase in the total number of IHE between 1939 and 1949, despite the Great Depression and U.S. active involvement in WWII. While the Great Depression was an economic disincentive to the founding of new IHE, it also was an important motivation for legislators to propose federal higher education funding for veterans under the WWII G.I. Bill of 1944 (see Chapter 3, Section 3.3.4.1.). The enactment of the WWII G.I. Bill in 1944 contributed to enrollment surges in IHE as early as 1945 (see Table 3.3. and Table 6.1.). There was a clear demand for new IHE at this time; however, there were delays in new institution formation, as a result of the recognized lags between the planning, founding, and accreditation for new IHE.

Secondly, the number of new IHE grew nearly 40 percent between 1960 and 1970. There was an absolute increase of 754 IHE, and the total number of IHE in the nation surpassed 2,000 during this decade. The IHE established or accredited (see Footnote 2) between 1960 and 1970 accounted for 23 percent of all IHE either founded or accredited between 1939 and 2007. The percent change in the total number of IHE (40 percent) was directly comparable to the percent change in the college-age population (hereafter, CAPOP) (39 percent) during the 1960s (see Table 5.1.). Two factors played a role in these patterns. First, federal funding for the Korean and Vietnam G.I. Bills overlapped during the 1960s.

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\(^2\) The use of "new" in Chapters 5 and 6 refers to IHE newly established and/or newly accredited within the referenced time frame. For example, an institution may have been established in 1950, but may not have been accredited until 1959. Therefore, that institution would first report enrollment data for 1960. Since only those IHE reporting enrollment are included in the data counts (see Footnote 1), the aforementioned institution example would first show up in the counts for 1960.
Second, baby boomers born in 1946 reached 18 years of age (i.e., they were college-age) in 1964 (see Chapter 3, Section 3.5.2.). The combination of these demographic and federal influences contributed to large numbers of new and accredited IHE and, in particular, large numbers of new and accredited two-year IHE (see Chapter 4, Section 4.4.3. and Section 5.2.1.) between 1960 and 1970.

Thirdly, 766 IHE new were added in the decade between 1980 and 1990. The CAPOP (see Table 5.1.) declined by nearly 4 percent during this decade, yet there was a 25 percent increase in the total number of IHE. The rising importance of alternative types of IHE (i.e., two-year and private, for-profit IHE) accounted for the majority of the growth in new and accredited IHE during this decade (see Tables 5.2. and 5.3.). Growth in the number of IHE slowed between 1990 and 2000. The percent change in IHE held at 10 percent through 2007, despite the continuing decline in CAPOP. By 2000, nearly 87 percent of all IHE open in 2007 had been established and/or accredited.

The preceding overview of national variations in the total numbers of IHE between 1939 and 2007 sets the stage for more detailed analyses at the nation level. Changes in the numbers of IHE by institutional type (i.e., LEVEL and CONTROL) are analyzed (Section 5.2.1. and 5.2.2., respectively). The use of multiple variables to characterize IHE across type of institution provides a detailed representation of the changing structure of higher education after WWII.

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3 The counts (see Table 5.1.) for the number of IHE established in 2000 and 2007 may be slightly lower here than reported elsewhere. The data in Table 5.1. reflect IHE established and accredited as of 2009.
5.2.1. IHE by LEVEL

The classification of IHE by the highest LEVEL of study offered at an institution provides a general characterization of the range of services offered by IHE. Most existing studies of U.S. higher education focus either on four-year or on two-year IHE (Townsend, 2004). Graphing the numbers of four- and two-year IHE during the study period reveals the importance of examining IHE by LEVEL (Figure 5.1.). Four-year IHE dominated the higher education arena in 1939; four-year IHE accounted for 81 percent (1,133 IHE) of all IHE in 1939, while two-year IHE comprised 19 percent (264 IHE) of all IHE in the same year (Table 5.2.). The relatively low presence of two-year IHE at the start of the focal period is not surprising, given the characteristics of IHE prior to 1940 (see Chapter 4).

During the study period, the total numbers of four- and two-year IHE increased each year (see Table 5.2.). At the start of the study period, the numbers of four- and two-year IHE were increasing at similar rates. The addition of more than 750 four- and two-year IHE in the 1960s served to accommodate both veteran (i.e., Korean and Vietnam G.I. Bill recipients) and baby boom attendees. However, in the 1960s, a structural change in the U.S. higher education system occurred (see Chapter 4, Section 4.4.2.). Between 1960 and 1970, the total number of two-year IHE more than doubled, while the total number of four-year IHE increased just 21 percent (see Table 5.2.). Growth in two-year IHE surpassed growth in four-year IHE throughout the 1970s and 1980s as well. The period between 2000 and 2007 was the only time in the study period in which growth in four-year IHE surpassed growth in two-year IHE by a substantial margin (see Section 5.2.2.).
**Table 5.2.: Population of IHE, by LEVEL, 1939-2007**

<table>
<thead>
<tr>
<th>Year</th>
<th>Four-year IHE</th>
<th>Two-year IHE</th>
<th>Four-year IHE</th>
<th>Two-year IHE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Percent change</td>
<td>Percent of all IHE</td>
<td>Total</td>
</tr>
<tr>
<td>1939</td>
<td>1,133</td>
<td>81.1</td>
<td>264</td>
<td>18.9</td>
</tr>
<tr>
<td>1949</td>
<td>1,366</td>
<td>20.6</td>
<td>310</td>
<td>17.4</td>
</tr>
<tr>
<td>1960</td>
<td>1,500</td>
<td>9.8</td>
<td>390</td>
<td>25.8</td>
</tr>
<tr>
<td>1970</td>
<td>1,818</td>
<td>21.2</td>
<td>826</td>
<td>111.8</td>
</tr>
<tr>
<td>1980</td>
<td>1,972</td>
<td>8.5</td>
<td>1,094</td>
<td>32.4</td>
</tr>
<tr>
<td>1990</td>
<td>2,145</td>
<td>8.8</td>
<td>1,687</td>
<td>54.2</td>
</tr>
<tr>
<td>2000</td>
<td>2,349</td>
<td>9.5</td>
<td>1,873</td>
<td>11.0</td>
</tr>
<tr>
<td>2007</td>
<td>2,705</td>
<td>15.2</td>
<td>1,951</td>
<td>4.2</td>
</tr>
</tbody>
</table>

Source: Calculations derived from author's data base. See Chapter 2, Section 2.3. for sources.
Therefore, between 1939 and 2007, the proportion of two-year IHE relative to all IHE rose appreciably. The number of two-year IHE grew by more than sevenfold between 1939 and 2007, while the number of four-year IHE doubled during the same time period. By 2007, two-year IHE accounted for 42 percent (1,951) of all IHE, while four-year IHE comprised 58 percent (2,705) of all IHE.

5.2.2. IHE by CONTROL

Analyzing national trends in the numbers of IHE across CONTROL provides yet another layer of understanding into the changing landscape of U.S. higher education after WWII. Most existing higher education research relies upon a two-tier classification of institutional CONTROL, which identifies IHE either as public or private. Within this dissertation, three mutually exclusive classifications of CONTROL are used: public; private, non-profit; and private, for-profit. The division of private IHE into private, non-profit and private, for-profit adds a greater specificity to the study of institutional CONTROL, particularly since these types of IHE differ markedly in the temporal and spatial circumstances of their founding, mission, and clientele (see Chapter 4).

The total number of IHE present within each CONTROL group increased over the entire study period (Table 5.3.). At the start of the focal period, there were more private, non-profit IHE than any other type of IHE. In 1939, private, non-profit IHE accounted for 61 percent, public IHE comprised 39 percent, and private, for-profit IHE constituted one-tenth of one percent of all IHE. The total number of private, non-profit IHE doubled during the study period, yet the relative share of private, non-profit IHE declined approximately 24 percent between 1939 and 2007. After 1949, the proportion of private, non-profit IHE relative to all other IHE declined each year in the study period. The most marked drop in the share of
There were two periods of significant structural change (see Chapter 4, Section 4.4.) in patterns of institutional CONTROL that contributed to the decline in the proportion of private, non-profit IHE between 1939 and 2007. Firstly, even though the relative share of public IHE remained essentially the same at the start (39 percent) and end (38 percent) of the study period, the total number of public IHE tripled during the study period. In the
period between 1960 and 1970, the total number of public IHE increased by 72 percent. Growth in the number of public IHE during this time reduced the gap between the number of public IHE and the number of private, non-profit IHE in the nation. The overall share of public IHE relative to all IHE peaked at 47 percent in 1980 and 1990, yet 2007 was the only year in which the number of public IHE surpassed the number of private, non-profit IHE. Public IHE accounted 38 percent and private, non-profit IHE accounted for 37 percent of all IHE in 2007.

Secondly, there was a dramatic increase in the number of private, for-profit IHE during the study period. At the start of the study period, only two private, for-profit IHE were open, accredited, and reporting enrollment. The relative share of private, for-profit IHE grew steadily after 1970. By 1990, private, for-profit IHE accounted for 11 percent of all IHE. Most of the growth in private, for-profit IHE between 1970 and 2007 was in the two-year sector (see Chapter 4, Section 4.4.5.). By 2007, there were 1,131 private, for-profit IHE, accounting for 24 percent of all IHE in 2007.

5.3. State-level findings

Tracing the patterns of IHE at the national level sets the context for the study of IHE across states, which is the second scale of geographical analyses of IHE. The state-level analyses provide greater spatial detail to the nation-level analyses in Section 5.2. and the region-level descriptions in Chapters 3 and 4. The objective of the state-level analyses was to determine how the concentration of IHE varied over time relative to CAPOP using the location quotient (hereafter, LQ). Using LQ analyses to examine the concentration of IHE relative to population lends greater specificity to earlier discussions of states with high numbers of IHE (see Table 3.7.). LQ analyses were conducted using the following equation:
\[ \text{LQ (CAPOP)} = \frac{\text{IHE in \STATE}}{\text{CAPOP in \STATE}} / \frac{\text{IHE in the U.S.}}{\text{CAPOP in the U.S.}} \]

The results of the LQ calculations were classified using a three-point scale: LQ values less than 0.80 indicate under-representation of IHE relative to population, values greater than 1.20 denote over-representation of IHE relative to population, and values between 0.80 and 1.20 suggest neutral concentrations of IHE relative to population. Neutral values suggest that the numbers of IHE and CAPOP within a state are average (i.e., balanced) relative to the numbers of IHE and CAPOP in the nation. LQ values were mapped using small multiples to maximize the comparability of results across states and time.

The number of states with neutral LQ values increased between 1939 and 2007 (Figure 5.2.). In 1939, seventeen states observed neutral, twelve states exhibited low, and twenty-two states contained high concentrations of IHE relative to population. The number of states possessing neutral LQ values peaked in 1990, with twenty-four (47 percent of all states). In 1990, eight states and nineteen states showed LQ values in the low and high ranges, respectively. By 2007, twenty states each had neutral LQ values, twenty-one had high LQ values, and ten states had low LQ values.

Two trends are evident in the state-level analyses of the concentration of IHE relative to CAPOP between 1939 and 2007. Firstly, the number of states possessing high LQ values stayed relatively constant during the study period, and ten states possessed high LQ values for the duration of the study period. In the Northeast, New Hampshire and Vermont exhibited high LQ values in all study years. Maine displayed over-representation of IHE relative to CAPOP for all years except 1939. Six states in the Midwest region (i.e., Iowa, Kansas, Missouri, Nebraska, North Dakota, and South Dakota) possessed high concentrations of IHE relative to CAPOP for the entire study period as well.
Figure 5.2.: Concentration of all IHE, by state, 1939-2007

Source: Calculations derived from author’s database (see Chapter 2, Section 2.3).
The District of Columbia in the South and Montana in the West also had high concentrations of IHE relative to CAPOP.

Secondly, the number of states possessing low LQ values declined from twelve states (23 percent of all states) in 1939 to eight states (16 percent) in 1990 before rising to ten states (20 percent) in 2007. Michigan and New Jersey were the only states to exhibit low LQ values for the entire study period. In both Michigan and New Jersey, IHE were under-represented relative to CAPOP between 1939 and 2007. Although New Jersey and Michigan were the only states to observe low LQ values for all IHE for the duration of the study period, low concentrations of IHE relative to the college-aged population also were notable in states which experienced dramatic population growth between 1939 and 2007. Growth in CAPOP exceeded institutional growth in Nevada after 1960, California after 1970, and Texas and Utah after 1980. The geographic concentration of the boomlet in South and West states (Keller, 2001; see also Chapter 3, Section 3.5.2.) contributed to growth in CAPOP out-pacing institutional growth in these states.

The preceding analyses provide insight into the changing spatial concentration of IHE relative to CAPOP across states. Addressing state-level variations in the numbers of IHE across institutional type extends the understanding of spatial variations in the provision of U.S. higher education between 1939 and 2007. In the subsequent sections, the LQ is used to measure the concentration of IHE relative to CAPOP across LEVEL (Section 5.3.1.) and CONTROL (Section 5.3.2.) of institution.

5.3.1. Location quotients by LEVEL

Performing LQ analyses across LEVEL reveals more precise spatial patterns of four- and two-year IHE for the study period. LQ analyses across LEVEL were conducted using the
following equations:

\[
\text{LQ}_{\text{Four}}(\text{CAPOP}) = \frac{\text{Four-year IHE in STATE}}{\text{Four-year IHE in the U.S.}} \div \frac{\text{CAPOP in STATE}}{\text{CAPOP in the U.S.}}
\]

\[
\text{LQ}_{\text{Two}}(\text{CAPOP}) = \frac{\text{Two-year IHE in STATE}}{\text{Two-year IHE in the U.S.}} \div \frac{\text{CAPOP in STATE}}{\text{CAPOP in the U.S.}}
\]

The LQ patterns of four-year IHE relative to CAPOP were very consistent throughout the time period (Figure 5.3.). Fourteen states possessed high LQ values in all study years. In New England, the states of Maine, Massachusetts, New Hampshire, and Vermont retained high concentrations of four-year IHE relative to population throughout the study period. Six states within the Midwest’s West North Central region (see Table 2.1.)—Iowa, Kansas, Missouri, Nebraska, North Dakota, and South Dakota—contained high LQ values in all study years. Four-year IHE were over-represented relative to CAPOP in three states in the South (i.e., District of Columbia, Tennessee, and West Virginia) and one state in the West (i.e., Montana) for the entire study period.

The New England region is the traditional core of private, non-profit higher education (see Chapter 3, Section 3.4.2.). In addition, the Midwest experienced a marked increase in the number of private, non-profit IHE after the Dartmouth College Case in 1819 (see Figure 4.4.). The continued strong presence of private, non-profit, four-year IHE, coupled with population losses in Midwest states after WWII, combined to explain the consistently high concentrations of four-year IHE relative to CAPOP in the Midwest. Similar patterns of population losses in West Virginia and Pennsylvania (after 1949) contributed to over-representation of four-year IHE relative to CAPOP.
Figure 5.3: Concentration of four-year IHE, by state, 1939-2007

- Under-represented (< 0.80)
- Neutral (0.80 - 1.20)
- Over-represented (> 1.20)

Source: Calculations derived from author’s database (see Chapter 2, Section 2.3).
Low concentrations of four-year IHE provide new insights into patterns of institution and population growth after WWII. The time-series maps show a persistent under-representation of four-year IHE in the West. Four states were under-represented in terms of four-year IHE relative to CAPOP: Arizona, California, Louisiana, and Wyoming. Florida was under-represented from 1939 to 2000, Nevada was under-represented between 1949 and 2007, Utah and Texas were under-represented from 1960 to 2007, and Idaho was under-represented from 1970 to 2007. It has been oft-cited that western states could not catch up with the early temporal advantage that their eastern counterparts enjoyed in establishing private, non-profit IHE (see Chapter 3, Section 3.4.2.). However, it is clear that western states could not catch up in the establishment of four-year IHE as well (see Figure 5.3.). Expanding populations in western states like California, Arizona, Nevada, and Utah translated to lower-than-expected concentrations of four-year IHE in these states.

Interpreting the concentration of two-year IHE relative to CAPOP at the state level involves understanding the changing numbers of two-year IHE throughout the study period. There were 1,133 four-year IHE and 264 two-year IHE in the U.S. in 1939 (see Table 5.2.). The number of two-year IHE did not surpass 1,100 until after 1980, more than four decades later. The comparatively late start in establishing two-year IHE explains some of the state-level variability with regard to the concentration of two-year IHE relative to CAPOP in the early part of the study period. California and Texas had the most two-year IHE in 1939, with 39 and 20 two-year IHE, respectively. In 1939 and 1949, nine states contained zero two-year IHE. There was a divergence in high and low LQ values for two-year IHE before 1970; there were very few neutral states until 1970. Increases in the number of states containing neutral concentrations of two-year IHE relative to CAPOP corresponded to the growing role of two-year IHE in the higher education landscape after 1960 (see Chapter 4, Section 4.4.3.).
There are three key spatial patterns in two-year IHE relative to CAPOP for the study period. Firstly, whereas western and southern states lagged behind the Northeast and Midwest in terms of the concentrations of four-year IHE, California and Texas were leaders in establishing two-year IHE (Figure 5.4.). California was the state with the greatest number of two-year IHE for the entire study period (see Chapter 4, Section 4.4.3.). However, after 1960, rising populations in California and Texas contributed to these states dropping out of the over-represented range for two-year IHE (see Chapter 3, Section 3.5.). Seven of the sixteen states with above-average numbers of two-year IHE in 1939 were in the Midwest (i.e., Iowa, Illinois, Kansas, Michigan, Minnesota, Missouri, and Oklahoma).

Secondly, a cluster of states in the Northeast (i.e., Indiana, Ohio, Pennsylvania, New Jersey, and Delaware) were under-represented in the concentration of two-year IHE relative to CAPOP through 1970. The Northeast was relatively late in the establishment of two-year IHE. By 2007, New York, Ohio, and Pennsylvania were among the five states with the greatest number of two-year IHE. Indiana and New Jersey were the only states in this group to be under-represented in terms of two-year IHE in 2007.

Thirdly, four states (i.e., Iowa, Kansas, North Dakota, and Oklahoma) possessed high LQ for two-year IHE relative to CAPOP for all years. Both Iowa and North Dakota had declines in the college-aged population between 1940 and 2000. Kansas and Oklahoma gained college-aged population, but were below the national average for growth in CAPOP between 1940 and 2000. However, the numbers of two-year IHE evidently kept pace with CAPOP in Iowa, Kansas, North Dakota, and Oklahoma during the study period.
Figure 5.4.: Concentration of two-year IHE, by state, 1939-2007

- Under-represented (< 0.80)
- Neutral (0.80 - 1.20)
- Over-represented (> 1.20)

Source: Calculations derived from author’s database (see Chapter 2, Section 2.3).
5.3.2. Location quotients by CONTROL

Analyses of IHE relative to CAPOP across institutional CONTROL provide another layer of understanding to U.S. higher education between 1940 and 2000. LQ analyses across CONTROL were conducted using the following equations:

\[
\text{LQ}_{\text{Public}} (\text{CAPOP}) = \frac{\text{Public IHE in STATE / CAPOP in STATE}}{\text{Public IHE in the U.S. / CAPOP in the U.S.}}
\]

\[
\text{LQ}_{\text{NP}} (\text{CAPOP}) = \frac{\text{Private, non-profit IHE in STATE / CAPOP in STATE}}{\text{Private, non-profit IHE in the U.S. / CAPOP in the U.S.}}
\]

\[
\text{LQ}_{\text{FP}} (\text{CAPOP}) = \frac{\text{Private, for-profit IHE in STATE / CAPOP in STATE}}{\text{Private, for-profit IHE in the U.S. / CAPOP in the U.S.}}
\]

The subsequent interpretations of the LQ findings emphasize spatial and temporal changes in IHE within and between the institutional control groups.

An average of twenty-four states (48 percent of all states) were classified as over-represented in terms of the concentration of public IHE relative to CAPOP during the study period (Figure 5.5.). The West and Midwest over-representation of public IHE relative to CAPOP is clearly evident between 1939 and 1960, when the majority of states west of the Mississippi River were over-represented. Most states in the Midwest retained a high concentration of public IHE for the entire study period, whereas states with population increases in the West and South (i.e., Arizona, California, Florida, Nevada, Texas, and Utah) fell into the under-represented category after 1980 or 1990 (see Chapter 3, Section 3.5.). Growth in public IHE could not keep pace with growth in population in these states, even though California and Texas consistently had the highest numbers of public IHE in the U.S.
Figure 5.5: Concentration of public IHE, by state, 1939-2007

Source: Calculations derived from author’s database (see Chapter 2, Section 2.3).
State-level analyses of the concentration of private, non-profit IHE relative to CAPOP exhibited very consistent patterns throughout the study period (Figure 5.6.). In 1939, nearly equal percentages of states were under-represented (33 percent), neutral (35 percent), and over-represented (31 percent) in terms of private, non-profit IHE relative to CAPOP. Private, non-profit IHE represented nearly 62 percent of all IHE in 1949 (see Table 5.3.). As the ratio of private, non-profit IHE declined relative to the other CONTROL groups over the study period, a distinctive regional geography of private, non-profit IHE relative to CAPOP emerged.

The West and South U.S. were under-represented in terms of private, non-profit IHE relative to CAPOP. Literature (see Chapter 3, Section 3.4.2.) and analyses of four-year IHE (see Section 5.3.1.) indicate that western and southern states could not catch up with the early temporal advantage that their eastern counterparts enjoyed in establishing private, non-profit IHE. In fact, Oregon was the only western state to consistently possess either over-represented or neutral LQ values for private, non-profit IHE. Oregon had more private, non-profit IHE than public IHE for all study years, except 1980, when the numbers of private, non-profit and public IHE were equal.

Whereas the West and South U.S. were under-represented in terms of private, non-profit IHE relative to CAPOP, a cluster of Midwest and Northeast states were over-represented. In fact, within five of the seven states within the West North Central region (see Table 2.1.)—Iowa, Kansas, Missouri, Nebraska, and South Dakota—private, non-profit IHE were over-represented throughout the study period. Relatively high numbers of small, private, non-profit IHE within these states, coupled with population declines over the study period, translated into consistently high proportions of private, non-profit IHE relative to CAPOP.
Figure 5.6: Concentration of private, non-profit IHE, by state, 1939-2007

- Under-represented (< 0.80)
- Neutral (0.80 - 1.20)
- Over-represented (> 1.20)

Source: Calculations derived from author’s database (see Chapter 2, Section 2.3).
In the Northeast U.S., four of the six New England states—Massachusetts, Maine, New Hampshire, and Vermont—were over-represented in terms of private, non-profit IHE relative to CAPOP. These New England states comprise the historical roots of private, non-profit IHE within the nation (see Chapter 4). Even though the percentage of private, non-profit IHE relative to other IHE within these states has been declining since 1970, the relative number of private, non-profit IHE relative to CAPOP remains high.

Whereas the private, non-profit institution dates back to the 1636 in the U.S., private, for-profit IHE did not gain momentum in the U.S. until the 1980s (see Chapter 4, Section 4.4.5.). Therefore, the maps of LQ values of private, for-profit IHE relative to CAPOP show marked contrasts between states, especially in the early part of the study period (Figure 5.7.). In 1939, private, for-profit IHE were open and accredited in just two states: California and Pennsylvania. Between 1939 and 1970, an average of forty-five states (88 percent of all states) was under-represented in their shares of private, for-profit IHE relative to CAPOP. By 1970, thirty-seven states (72 percent of all states) still did not contain any private, for-profit IHE. The number of states with zero private, for-profit IHE had dropped to seventeen states (33 percent of all states) by 1980 and two states (i.e., Delaware and Montana) by 2007. Between 1980 and 2000, the majority of states (52 percent of all states) were under-represented in their shares of private, for-profit IHE relative to CAPOP. In fact, 2007 was the only study year in which under-represented LQ values accounted for less than 50 percent of all LQ values of private, for-profit IHE. Very few states exhibited neutral LQ values for private, for-profit IHE during the study period.
Figure 5.7: Concentration of private, for-profit IHE, by state, 1939-2007

- Under-represented (< 0.80)
- Neutral (0.80 - 1.20)
- Over-represented (> 1.20)

Source: Calculations derived from author’s database (see Chapter 2, Section 2.3).
Examining greater consistency in over-represented LQ values at the close of the study period provides insight into recent trends in the location of private, for-profit IHE. Between 1990 and 2007, ten states consistently were over-represented in terms of private, for-profit IHE: Arizona, New Mexico, Utah, Colorado, South Dakota, Nebraska, Indiana, Ohio, Pennsylvania, and Florida. In 2000 and 2007, California, Florida, and Pennsylvania and accounted for the greatest number of private, for-profit IHE, yet only Florida and Pennsylvania displayed high concentrations of private, for-profit IHE relative to population. Population growth in California out-paced the number of private, for-profit IHE in all years after 1949.

5.4. Point-level findings

The preceding discussion of nation- and state-level analyses yields new insights into the changing spatial scope and scale of U.S. higher education between 1939 and 2007. A description of point-level analyses provides the final layer of understanding in the assessment of patterns of IHE over space and through time. The Getis-Ord G\textsuperscript{i} statistic (Ord and Getis, 1995, 2001; Getis and Ord, 1996) can potentially reveal statistically significant high (i.e., “hot” spots) or low (i.e., “cold” spots) clusters of z-scores. The hot spot analysis spatial statistics tool within ArcMap™ (Esri® Inc., 2013) was used for G\textsuperscript{i} calculations. The results of the G\textsuperscript{i} calculations were classified using a three-point scale along a normal distribution:

<table>
<thead>
<tr>
<th>z-score</th>
<th>p-value (probability)</th>
<th>confidence level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.65 &lt;= z &lt;= 1.96</td>
<td>&lt; 0.10</td>
<td>90%</td>
</tr>
<tr>
<td>1.96 &lt; z &lt;= 2.58</td>
<td>&lt; 0.05</td>
<td>95%</td>
</tr>
<tr>
<td>&gt; 2.58</td>
<td>&lt; 0.01</td>
<td>99% (Esri® Inc., 2013).</td>
</tr>
</tbody>
</table>

Z-scores less than 1.65 and greater than -1.65 indicate a random pattern (i.e., no clustering).
The results for all IHE\textsuperscript{4} were displayed using small multiples and statistically significant z-scores were mapped for each study year (Figure 5.8.).

The \(G_i\) analyses identified statistically significant "hot" spots (i.e., highly clustered areas) of IHE, yet did not reveal any significant "cold" spots of IHE between 1939 and 2007. The presence of statistically significant "hot" spots of IHE reinforces the argument that some places have significantly higher concentrations of IHE than other places. Conversely, the lack of statistically significant "cold" spots of IHE indicates that there are no places with clusters of low z-score values.

Statistically significant z-scores increased over time in terms of their numbers and spatial representation for IHE. In 1939, there were 99 statistically significant z-scores for IHE. Comparing the 1939 \(G_i\) map with the locations of new IHE established between 1862 and 1940 (see Figure 4.6.) reveals similarities. While IHE were established in all states\textsuperscript{5} and the District of Columbia by 1940, there was a noted absence of IHE "hot" spots in the West through 1980 (see Figure 5.8.). Significant clusters of IHE in the Los Angeles and San Francisco areas were the sole representation of western IHE "hot" spots. By 2007, the number of statistically significant z-scores increased to 229, and statistically significant z-scores were present in all but five states (i.e., Idaho, Mississippi, Nebraska, North Dakota, and Wyoming). There are similarities in the locations of new IHE between 1940 and 2007 (see Figures 4.8. and 4.9.) and the clusters of statistically significant z-scores in 2000 and 2007. Major U.S. cities and state capitals can be easily identified in the maps both of the locations of new IHE and "hot" spots of IHE.

\textsuperscript{4} Future analyses will use the dissertation database to examine \(G_i\) by LEVEL and CONTROL of institution.

\textsuperscript{5} IHE were established before statehood in both Alaska and Hawaii.
Figure 5.8: Distribution of $G^*$ statistics for all IHE, 1939-2007

- $\triangle$ $1.65 \leq z < 1.96$
- $\triangle$ $1.96 \leq z < 2.58$
- $\blacktriangle$ $z \geq 2.58$

Source: Calculations derived from author’s database (see Chapter 2, Section 2.3).
5.5. Summary for institutions of higher education

The nation-level overview of U.S. higher education between 1939 and 2007 revealed key changes in the IHE after WWII. There were periods of strong growth in the number of IHE during the study period. Firstly, the total number of IHE increased 40 percent between 1939 and 1949, despite the Great Depression and the U.S. entrance into WWII. Secondly, the 1960s signaled a structural change in U.S. higher education in terms of LEVEL and CONTROL of IHE. The number of two-year IHE more than doubled between 1960 and 1970 (see Table 5.2.). Growth in two-year IHE surpassed growth in four-year IHE through the 1990s. In addition, 1960 represented a turning point for public IHE. There was a 72 percent increase in the number of public IHE between 1960 and 1970. Between 1970 and 2000, the percentages of public and private, non-profit IHE were nearly equal (see Table 5.3.). The rise of public IHE after 1960 may be explained in light of the growth of two-year IHE, which provided new opportunities for students to attend IHE (see Chapter 4, Section 4.4.3.).

Thirdly, there was a 25 percent increase in the total number of IHE between 1980 and 1990. Relatively recent types of IHE—two-year and private, for-profit IHE—accounted for the majority of the growth in this decade. By 1990, private, for-profit IHE represented 11 percent of all IHE.

The state-level LQ analyses of changes in the concentration of IHE relative to CAPOP extend the spatial understanding of U.S. higher education between 1939 and 2007. As Fonseca and Andrews’ (1993) quote introducing the chapter remarked, there is an acknowledged variation in the provision of both public and private higher education at the state level. However, statistical evidence of these variations remains largely unexplored.

Whereas the LQ analyses of all IHE (see Figure 5.2.) revealed consistencies in over-representation and under-representation of IHE relative to CAPOP, the analyses by LEVEL
and CONTROL provided more detail of variations between states and regions. Overall, two major findings emerge from the state-level analyses. Firstly, all states experienced growth in the numbers of IHE between 1939 and 2007. However, the numbers of total, four-year, public, and private, non-profit IHE could not always keep pace with growing college-aged populations in the West (i.e., Arizona, California, Nevada) and South (i.e., Florida, Georgia, Texas) (see Figures 5.2, 5.3, 5.5, and 5.6). Two-year IHE were better able to stabilize relative to CAPOP in Arizona, California, Florida, and Georgia (see Figure 5.4).

Secondly, state-level analyses reinforced the literature contention (see Chapters 3 and 4) of a Northeast and, often, Midwest, advantage in establishing private, non-profit IHE. However, the state results also established that West (i.e., Arizona, California, Nevada, Oregon, and Utah) and South (i.e., Florida and Texas) states could not catch up with the Northeast and Midwest in terms of establishing four-year IHE as well. The comparatively late start in founding both four-year and private, non-profit IHE within these states caused a lag in concentrations of four-year and private, non-profit IHE relative to CAPOP, especially since these states were some of the fastest growing states in the nation after WWII.

At the point level, \( G_i^r \) analyses revealed statistically significant “hot” spots of IHE, but failed to identify statistically significant “cold” spots of IHE. Moreover, statistically significant “hot” spots of IHE were found all but four states (i.e., Idaho, Nebraska, North Dakota, and Wyoming) by 2007. Therefore, the \( G_i^r \) analyses indicated that significant clusters of IHE are present within most U.S. states. Moreover, the point-level analyses implied that there are no places within the U.S. with inadequate numbers of IHE based on the absence of “cold” spots. Future inquiries will examine this assumption within states, particularly within rapidly-growing states.
Chapter 6

FINDINGS FOR ENROLLMENT

Altho [sic] young people of the usual college ages are outside the jurisdiction of compulsory school attendance laws, powerful social and economic factors have operated to increase enrollments [sic] in institutions of higher education (Educational Policies Commission, 1938: 35).

6.1. Introduction

Chapter 6 emphasizes variations in the numbers and types of enrollment in IHE at the national, state, and point levels between 1939 and 2007. This chapter accompanies Chapter 5, which examined growth in the number of IHE during the same time frame. In Chapter 6, results for analyses of enrollment are organized by spatial scale of analysis: nation (Section 6.2.), state (Section 6.3.), and point (Section 6.4.). The chapter concludes by reinforcing the connections between enrollment growth and key educational, federal, state, and demographic factors (see Chapter 3).

6.2. Nation-level findings

Studying changes in higher education enrollment at the national level establishes a context for analyzing variations in enrollment at different spatial scales. The number of students enrolled in U.S. IHE has increased every decade since the USDE first began recording higher education enrollment (USDE, 2000). Approximately 52,000 students were enrolled in IHE during the 1869-70 academic year (USDE, 2000). By the 1929-1930 academic year, total enrollment in IHE had risen to 1.1 million students (USDE, 2000). The addition of more than one million students to IHE in a span of approximately sixty years merits an acknowledgment, particularly for contextual purposes. Specifically, the study
period for enrollment analyzed in this dissertation, 1939 to 2007, covers sixty-eight years. During this study period, enrollment in IHE grew by 16.9 million students (Table 6.1.). The addition of more than 16 million students to IHE translated into a nearly thirteenfold increase in total enrollment between 1939 and 2007. Over the same time period, the college-age population (hereafter, CAPOP) (i.e., 18 to 29 year olds) grew by 18.7 million persons. The rate of change for CAPOP between 1939 and 2007 was 67.5 percent. Understanding why enrollment grew at an immense rate compared to CAPOP is important in telling the history of higher education in the United States after WWII.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of students</th>
<th>Absolute change</th>
<th>Percent change</th>
<th>18-29 year olds</th>
<th>Percent change in 18-29 year olds</th>
<th>Total enrollment as a percent of 18-29 year olds</th>
</tr>
</thead>
<tbody>
<tr>
<td>1939</td>
<td>1,460,487</td>
<td></td>
<td></td>
<td>27,782,251</td>
<td>5.3</td>
<td>5.3</td>
</tr>
<tr>
<td>1949</td>
<td>2,418,131</td>
<td>957,644</td>
<td>65.6</td>
<td>28,129,639</td>
<td>1.3</td>
<td>8.6</td>
</tr>
<tr>
<td>1960</td>
<td>3,584,681</td>
<td>1,166,550</td>
<td>48.2</td>
<td>26,449,872</td>
<td>-6.0</td>
<td>13.6</td>
</tr>
<tr>
<td>1970</td>
<td>8,324,932</td>
<td>4,740,251</td>
<td>132.2</td>
<td>36,778,492</td>
<td>39.0</td>
<td>22.6</td>
</tr>
<tr>
<td>1980</td>
<td>11,970,605</td>
<td>3,645,673</td>
<td>43.8</td>
<td>49,389,287</td>
<td>34.3</td>
<td>24.2</td>
</tr>
<tr>
<td>1990</td>
<td>13,941,586</td>
<td>1,970,981</td>
<td>16.5</td>
<td>47,521,190</td>
<td>-3.8</td>
<td>29.3</td>
</tr>
<tr>
<td>2000</td>
<td>15,362,553</td>
<td>1,420,967</td>
<td>10.2</td>
<td>46,524,790</td>
<td>-2.1</td>
<td>33.0</td>
</tr>
<tr>
<td>2007</td>
<td>18,416,922</td>
<td>3,054,369</td>
<td>19.9</td>
<td>46,524,790</td>
<td>n/a</td>
<td>39.6</td>
</tr>
</tbody>
</table>

Source: 1 See Chapter 2, Section 2.3. for sources.  
2 Population data are for decade years from the Minnesota Population Center (2004).  
3 Population data for 2000 is used for the 2007 calculations.
Total enrollment in U.S. IHE was nearly 1.5 million in 1939 (see Table 6.1.). Although the Great Depression was a disincentive to establishing new IHE, the increasing value of a higher education was an incentive for individuals to attend IHE in the 1930s and 1940s. Between 1939 and 1949, enrollment in IHE grew nearly 66 percent (957,644 new students). Total enrollment as a percentage of CAPOP rose 63 percent over the same time period. The 1944 enactment of the G.I. Bill stimulated a rapid increase in enrollment as veterans returned from WWII to attend IHE in record numbers (see Table 3.1.). The peak of enrollment for veterans using the WWII G.I. Bill occurred in 1947, when 1.15 million veterans were enrolled in IHE (U.S. Veterans Administration, 1961). Veteran enrollment in 1949 was 843,677 students, which represented nearly 35 percent of all students enrolled in U.S. IHE in 1949.

The 1950s saw a continued entry of WWII and Korean War veterans into IHE across the nation as well as an influx of non-veteran students. The peak of Korean veteran enrollment in IHE was 1956, when 473,488 veterans were enrolled (U.S. Veterans Administration, 1965; see Table 3.3.). In 1960, Korean War veterans accounted for nearly 5 percent of total enrollment in IHE. Between 1949 and 1960, there was an increase of nearly 1.2 million students to U.S. IHE. Total enrollment in IHE as a percentage of CAPOP rose 57 percent between 1949 and 1960, even though CAPOP declined 6 percent over the same time period. New types of IHE began to play a larger role in the landscape of higher education provision at this time. A wider array of institutional choices translated into non-veteran enrollees attending IHE in record numbers and a greater diversity of students across demographic categories (see Chapter 3, Section 3.5.).

Just as the total number of IHE grew markedly between 1960 and 1970 (see Chapter 5, Section 5.2.), the number of students enrolled in IHE rose dramatically in the 1960s and 1970s as well. More than 4.7 million new students entered U.S. IHE between 1960 and 1970,
and total enrollment surpassed 8 million for the first time. Between 1970 and 1980, 3.6 million new students entered IHE, and total enrollment approached 12 million students in 1980. Key demographic changes in the 1960s and 1970s contributed to these enrollment expansions at IHE. Specifically, the baby boom generation reached college-age in approximately 1964. There was a 39 percent increase in CAPOP between 1960 and 1970, and a 34 percent increase in CAPOP between 1970 and 1980 (see Table 6.1.). Total enrollment as a percentage of CAPOP rose to nearly 23 percent in 1960 and 24 percent in 1970. The height of the baby boom was between 1947 and 1957, which meant that the children born in those years reached age 18 between 1965 and 1975 (see Chapter 3, Section 3.5.2.). In addition, the enactment of the Vietnam G.I. Bill in 1966 paved the way for a new generation of veterans to attend IHE, albeit at lower funding levels than did the Korean and WWII Bills (see Chapter 3, Section 3.3.4.1.). Funding for the Vietnam G.I. Bill ran from 1966 to May of 1975 (see Table 3.3.).

Total enrollment in IHE continued to rise after 1980, even though CAPOP declined after 1980. Baby boomers continued their entrance to college through the early 1980s, and the children of baby boomers (i.e., the boomlet) reached college-age beginning in the early 1980s and continuing into the late 1990s (see Chapter 3, Section 3.5.). Although overall growth in the absolute numbers of new students slowed after 1980, the total number of students still rose by nearly 2 million between 1980 and 1990 and 1.4 million between 1990 and 2000. Between 2000 and 2007 alone, the total number of students rose more than 3 million students.

After 1980, there also were important changes in the types of higher education services offered. For example, the proportion of students enrolled in two-year IHE surpassed 35 percent after 1980 (see Table 5.2.). In addition, small, private, non-profit IHE faced closures
amid increased competition for students from both public and private, for-profit IHE (see Chapter 4, Section 4.4.6.). All types of IHE confronted budgetary crises and rising tuition costs during this time as well (see Chapter 3, Section 3.4.1.). Despite challenges to students and IHE, total enrollment continued to rise after 1980. In addition, total enrollment as a percentage of CAPOP increased to 33 percent in 2000 and 40 percent in 2007. More than 18.4 million students were enrolled in 4,656 IHE in 2007.

The preceding summary of national patterns of total enrollment between 1939 and 2007 is the precursor for more detailed analyses at the nation level. Changes in enrollment by institutional type (i.e., LEVEL and CONTROL) are examined (Sections 6.2.1. and 6.2.2., respectively). In addition, variations in enrollment by SEX and ETHNICITY are detailed for 1980 to 2007 (Sections 6.2.3. and 6.2.4., respectively).

6.2.1. Enrollment by LEVEL

Analyzing the trajectories of enrollment in four- and two-year IHE provides additional information for understanding national patterns of institutional change. In absolute terms, the total number of students enrolled in four- and two-year IHE increased for every year studied between 1939 and 2007 (Table 6.2.). Specifically, four-year IHE gained nearly 10.3 million students over the study period, while two-year IHE gained 6.6 million students. However, enrollment in two-year IHE grew at a faster pace than did four-year enrollment; the percent change in two-year enrollment from year-to-year exceeded the percent change in four-year enrollment in all years except 2007.
Table 6.2.: Enrollment in IHE, by LEVEL, 1939-2007

<table>
<thead>
<tr>
<th>Year</th>
<th>Four-year Enrollment</th>
<th></th>
<th>Two-year Enrollment</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Students</td>
<td></td>
<td>Percent change</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Percent of all</td>
<td></td>
<td>Students</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Enrollment</td>
<td></td>
<td>Percent change</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Percent of all</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Enrollment</td>
<td></td>
</tr>
<tr>
<td>1939</td>
<td>1,374,904</td>
<td>94.1</td>
<td>85,583</td>
<td>5.9</td>
</tr>
<tr>
<td>1949</td>
<td>2,259,611</td>
<td>64.3</td>
<td>158,520</td>
<td>85.2</td>
</tr>
<tr>
<td>1960</td>
<td>3,168,909</td>
<td>40.2</td>
<td>415,772</td>
<td>162.3</td>
</tr>
<tr>
<td>1970</td>
<td>6,209,959</td>
<td>96.0</td>
<td>2,114,973</td>
<td>408.7</td>
</tr>
<tr>
<td>1980</td>
<td>7,641,768</td>
<td>23.1</td>
<td>4,328,837</td>
<td>104.7</td>
</tr>
<tr>
<td>1990</td>
<td>8,578,329</td>
<td>12.3</td>
<td>5,363,257</td>
<td>23.9</td>
</tr>
<tr>
<td>2000</td>
<td>9,361,240</td>
<td>9.1</td>
<td>6,001,313</td>
<td>11.9</td>
</tr>
<tr>
<td>2007</td>
<td>11,693,921</td>
<td>24.9</td>
<td>6,723,001</td>
<td>12.0</td>
</tr>
</tbody>
</table>

Source: Calculations derived from author’s data base. See Chapter 2, Section 2.3. for sources.

Higher education enrollment during the 1930s and early 1940s was shaped by the economic and educational circumstances of the time. The Great Depression of the 1930s and the U.S. presence in WWII in the early 1940s both were deterrents to enrolling in IHE. In addition, the relatively low presence of two-year enrollment at the start of the focal period is not surprising, given the characteristics of IHE and students prior to 1940. Low high school and postsecondary graduation rates reinforced the notion that higher education was only feasible for wealthier individuals; fewer than 25 percent of all U.S. citizens had completed high school, and fewer than 5 percent had completed four or more years of postsecondary instruction by 1940 (see Chapter 3, Section 3.2. and Table 3.3.).
Examining the numbers of students enrolled in four- and two-year IHE reveals the dominance of traditional, four-year IHE at the start of the study period. In 1939, four-year IHE accounted for 94 percent of the nearly 1.5 million students enrolled in IHE. Approximately 85,000 students were enrolled in two-year IHE in 1939, accounting for six percent of total enrollment in IHE. Between 1939 and 1949, total enrollment in IHE grew by nearly 1 million students. Enrollment growth during this time was fueled by veterans utilizing funds from the WWII Bill to enroll in IHE; in 1949 alone there were 843,677 veterans using WWII G.I. Bill funds at IHE (see Table 3.3.). The ratios of four- and two-year enrollment remained virtually the same in 1939 and 1949. In 1949, four-year enrollment accounted for 93 percent of total enrollment, while two-year IHE accounted for nearly 7 percent of total enrollment. However, there were indications that changes in the provision of higher education were occurring. In 1949, enrollment in two-year IHE began growing at a faster pace than enrollment in four-year IHE. Increasing numbers of two-year IHE, combined with the growing importance of a higher education (see Chapter 3, Section 3.2.), encouraged the enrollment of both veteran and non-veteran students who previously would have considered postsecondary education out of their financial, social, and/or spatial reach.

Enrollment increases continued into the 1950s. Between 1949 and 1960, total enrollment in IHE grew by nearly 1.2 million students. Veterans utilizing funds from both the WWII and Korean G.I. Bills enrolled in IHE at record numbers. Two-year enrollment grew more rapidly than four-year enrollment; two-year enrollment rose by 162 percent (257,252 students) between 1949 and 1960. In comparison, four-year enrollment grew 40 percent (909,298 students). By 1960, the proportion of students enrolled in four-year IHE fell to 88 percent, while the proportion of students enrolled in two-year IHE rose to nearly 12 percent.
Total enrollment in IHE grew by 4.7 million students between 1960 and 1970 (see Table 6.1.), and the ratios of students enrolled in four- and two-year IHE changed considerably during that decade. While enrollment in four-year IHE doubled during the 1960s, enrollment in two-year IHE more than quintupled. The marked increase in students may be attributed partially to the entry of the first baby boomers to IHE in the mid-1960s (see Chapter 3, Section 3.5.2. and Table 3.10.). The Vietnam G.I. Bill also accounted for new enrollees in IHE after 1966 as well. In addition, the total number of two-year IHE more than doubled between 1960 and 1970, which expanded higher education access to even more individuals. By 1970, more than one-quarter of all students enrolled in IHE were attending two-year IHE.

The percentage of students enrolled in two-year IHE rose nearly 11 percent between 1970 and 1980; more than 2.2 million students were added to two-year IHE, and more than 1.4 million additional were added to four-year IHE during this decade. The proportion of students enrolled in two-year IHE continued to grow throughout the 1980s and 1990s. By 2000, 60 percent of all students were enrolled in four-year IHE, and 39 percent of all students were enrolled in two-year IHE. Demographic factors and economic conditions help explain patterns of enrollment change after 1980. The presence of an unusually large college-age cohort contributed to rising enrollments in all levels of IHE during this time (see Chapter 3, Section 3.5.2.). Specifically, the youngest members of the boomlet reached college-age beginning in the early 1980s, and the oldest reached college-age around 2000. In addition, changing occupational structures necessitated re-training and education for many individuals: two-year IHE seized that opportunity (see Chapter 3, Section 3.2. and Chapter 4, Section 4.4.3.). Two-year IHE also offered more flexible scheduling, which increased their appeal to many nontraditional students (i.e., students aged 25 years and older) (see Chapter 3, Section 3.5.3.3.). After 2000, the ratio of four-year enrollment increased slightly, due
mainly to enrollment increases at four-year, private, for-profit IHE.

6.2.2. Enrollment by CONTROL

Tracing national trends in the numbers students across CONTROL provides another layer of understanding into U.S. higher education after WWII. The total number of students enrolled in public, private, non-profit, and private, for-profit IHE increased every year between 1939 and 2007 (Table 6.3.). Public enrollment increased the most in absolute terms; total enrollment in public IHE rose by approximately 12.7 million students between 1939 and 2007. Enrollment in private, non-profit IHE grew by 2.9 million students during the focal period. Private, for-profit IHE experienced the smallest absolute growth in terms of the number of students enrolled (1.2 million), but also realized the largest relative growth in terms of the percent change in the number of students enrolled between 1939 and 2007.

Just as the absolute number of students enrolled in IHE varied by type of institution, the relative proportion of students enrolled in each type of institution varied as well. Enrollment in public and private, non-profit IHE combined to account for at least 98 percent of total enrollment in U.S. IHE through 1990. In 2000 and 2007, private, for-profit enrollment accounted for 3 and 6 percent of total enrollment in IHE, respectively (see Table 6.3.). Although the relative presence of private, for-profit enrollment was small, the marked growth in private, for-profit enrollment after 1990 signals an important change in the markets of higher education provision (see Chapter 4, Section 4.4.5.).
Table 6.3.: Enrollment in IHE, by CONTROL, 1939-2007

<table>
<thead>
<tr>
<th>Year</th>
<th>Public Enrollment</th>
<th>Percent of all enrollment</th>
<th>Private, Non-Profit Enrollment</th>
<th>Percent of all enrollment</th>
<th>Private, For-Profit Enrollment</th>
<th>Percent of all enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1939</td>
<td>792,514</td>
<td>54.3</td>
<td>666,995</td>
<td>45.7</td>
<td>978</td>
<td>0.1</td>
</tr>
<tr>
<td>1949</td>
<td>1,304,492</td>
<td>53.9</td>
<td>1,112,880</td>
<td>46.0</td>
<td>759</td>
<td>0.0</td>
</tr>
<tr>
<td>1960</td>
<td>2,199,669</td>
<td>61.4</td>
<td>1,377,717</td>
<td>38.4</td>
<td>7,295</td>
<td>0.2</td>
</tr>
<tr>
<td>1970</td>
<td>6,271,668</td>
<td>75.3</td>
<td>2,038,378</td>
<td>24.5</td>
<td>14,886</td>
<td>0.2</td>
</tr>
<tr>
<td>1980</td>
<td>9,384,672</td>
<td>78.4</td>
<td>2,491,014</td>
<td>20.8</td>
<td>94,919</td>
<td>0.8</td>
</tr>
<tr>
<td>1990</td>
<td>10,943,300</td>
<td>78.5</td>
<td>2,771,572</td>
<td>19.9</td>
<td>226,714</td>
<td>1.6</td>
</tr>
<tr>
<td>2000</td>
<td>11,774,772</td>
<td>76.6</td>
<td>3,144,152</td>
<td>20.5</td>
<td>443,629</td>
<td>2.9</td>
</tr>
<tr>
<td>2007</td>
<td>13,545,343</td>
<td>73.5</td>
<td>3,641,248</td>
<td>19.8</td>
<td>1,230,331</td>
<td>6.7</td>
</tr>
</tbody>
</table>

Source: Calculations derived from author's data base. See Chapter 2, Section 2.3. for sources.

In terms of CONTROL, the types of IHE established during the 1930s and 1940s were similar to the types of IHE established in the early 1900s (see Chapter 4). Public and private, non-profit IHE dominated the landscape of IHE, and the numbers of students enrolled in these types of IHE were increasing at similar rates. Additionally, in 1939, the ratios of public enrollment to private, non-profit enrollment were the closest of all years during the study period; public enrollment accounted for 54 percent of total enrollment in IHE, while private, non-profit enrollment accounted for nearly 46 percent of total enrollment in IHE. In every year between 1949 and 1990, the percentage of public enrollment increased, while the percentage of private, non-profit enrollment decreased.
Graphing enrollment in IHE across institutional CONTROL reveals two periods of enrollment change between 1939 and 2007 (Figure 6.1). Firstly, the combined effects of federal funding from the Korean and Vietnam War G.I. Bills (see Table 3.4.), coupled with the entrance of baby boomers to IHE beginning in the mid-1960s (see Table 3.10.), propelled enrollment in public IHE into a new trajectory during the 1960s. Enrollment in public IHE grew by 185 percent (more than 4 million students) between 1960 and 1970.
Enrollment in public IHE surpassed 6.2 million students in 1970. The dominance of public enrollment in IHE continued into the 1970s. Enrollment growth in public IHE continued to out-pace enrollment growth in private, non-profit IHE. Between 1970 and 1980, enrollment in public IHE increased by more than 3 million students (50 percent growth). By 1980, more than 9.3 million students were enrolled in public IHE. Enrollment in private, non-profit IHE surpassed 2.4 million in 1980, and total enrollment in the sector increased each year subsequently. However, during the era of mass higher education, small, private, non-profit IHE faced dwindling enrollments, rising tuition costs, and growing closure concerns (see Chapter 4, Section 4.4.6.).

Secondly, the increased presence of private, for-profit IHE in the 1980s spurred large enrollment gains in this sector for the latter part of the study period (see Chapter 4, Section 4.4.5. and Chapter 5, Section 5.2.2.). Enrollment growth in public IHE slowed considerably after 1980, and the relative shares of public enrollment dropped slightly in 2000 and 2007. Demographic and economic changes beginning in the 1990s and continuing into the 2000s made private, for-profit IHE appealing to older students who needed vocational or job training. Between 2000 and 2007, enrollment in private, for-profit IHE nearly tripled (see Table 6.3.). New entrants to higher education during this time were diverse across ethnicity, sex, and age (see Chapter 3, Section 3.5.3.). Public and private, for-profit IHE were well-suited to accept both types of students, while private, non-profit IHE remained academically selective and financially exclusive, thereby limiting their potential numbers of students (see Chapter 4, Section 4.4.6.).
6.2.4. Enrollment by SEX

Whereas the collection of total enrollment data at the institutional level has been consistent for more than 70 years, the gathering of enrollment data for individual IHE across SEX and ETHNICITY (see Section 6.2.5.) is more recent. For the dissertation database, enrollment data by SEX and ETHNICITY only were available at the institutional level between 1980 and 2007. According to literature sources, male enrollment in IHE was greater than female enrollment during the 1940s and 1950s, yet female enrollment began to rise in the 1960s and 1970s (see Chapter 3, Section 3.5.3.2.; Hudson, 2002; Goldin, et al., 2006). The percentage of female students in the U.S. rose from 41 to 51 percent between 1970 and 1980 (Hudson, 2002). In 1980, enrollment in U.S. IHE was 51.5 percent female and 48.5 percent male (Table 6.4.). By 2007, female enrollment had risen to 10.5 million students, or 57 percent of total enrollment. The growing proportion of females entering IHE is related to females delaying marriage and directly entering college after high school (see Chapter 3, Section 3.5.3.2.), as well as older females entering college (see Chapter 3, Section 3.5.3.3.). In addition, females were less likely than their male counterparts to be “high school dropouts, in the military, and in prison” (Anderson, 2002: 21-22). Future analyses using the dissertation database will examine SEX of students across LEVEL and CONTROL at the state- and point levels to extend the spatial and temporal understanding of changing female and male enrollment in IHE.
Table 6.4.: Enrollment in IHE, by SEX, 1980-2007

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Enrollment</th>
<th>Male Enrollment</th>
<th>Percent Male</th>
<th>Female Enrollment</th>
<th>Percent Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>11,970,605</td>
<td>5,810,703</td>
<td>48.5</td>
<td>6,159,902</td>
<td>51.5</td>
</tr>
<tr>
<td>1990</td>
<td>13,941,586</td>
<td>6,342,897</td>
<td>45.5</td>
<td>7,598,689</td>
<td>54.5</td>
</tr>
<tr>
<td>2000</td>
<td>15,362,553</td>
<td>6,744,354</td>
<td>43.9</td>
<td>8,618,199</td>
<td>56.1</td>
</tr>
<tr>
<td>2007</td>
<td>18,416,922</td>
<td>7,902,063</td>
<td>42.9</td>
<td>10,514,859</td>
<td>57.1</td>
</tr>
</tbody>
</table>

Source: Calculations derived from author’s data base.
See Chapter 2, Section 2.3. for sources.

6.2.5. Enrollment by ETHNICITY

After the Civil Rights Act was passed in 1964, the diversity of students at IHE increased (see Chapter 3, Sections 3.5.3. and 3.5.3.1.). The civil rights movement contributed to growing opportunities for Black students in higher education. Since the 1970s, U.S. society has grown more diverse due to rising immigration. In addition, financial access to IHE was expanded for all ethnic groups by the increased availability of federal student loans (see Chapter 3, Section 3.3.4.2.). The collection of enrollment data by ETHNICITY was improved in the mid-1970s, when Hispanics were first separated from Whites in data classification (Husdon, 2002). A "Race Unknown" category was added to ETHNICITY classifications in 1990.

Since 1980, the ethnic composition of students enrolled at IHE in the dissertation database has changed considerably (Table 6.5.). White students comprised 81 percent of all students in 1980. By 2007, White enrollment accounted for 59 percent of all students.
enrolled in U.S. IHE. The total numbers of Hispanic students more than tripled between 1980 and 2007, while the numbers of Black, Asian, and Indian students more than doubled during the same time period. Despite growing ethnic diversity in IHE, Hispanics and Blacks remain underrepresented in higher education (c.f., Chang, et al., 2003; Perna, 2005; Fullinwider, 2013). Future research will analyze ETHNICITY of students across LEVEL and CONTROL at the state- and point levels to learn more about the spatial variations in enrollment across ETHNICITY.

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Enrollment</th>
<th>White</th>
<th>Black</th>
<th>Hispanic</th>
<th>Asian</th>
<th>Indian</th>
<th>Race Unknown</th>
<th>Non-Resident Alien</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>11,970,605</td>
<td>81.4</td>
<td>9.1</td>
<td>3.9</td>
<td>2.3</td>
<td>0.7</td>
<td>n/a</td>
<td>2.5</td>
</tr>
<tr>
<td>1990</td>
<td>13,941,586</td>
<td>77.7</td>
<td>8.9</td>
<td>5.7</td>
<td>4.1</td>
<td>0.8</td>
<td>2.8</td>
<td>2.8</td>
</tr>
<tr>
<td>2000</td>
<td>15,362,553</td>
<td>64.6</td>
<td>10.8</td>
<td>8.9</td>
<td>5.9</td>
<td>0.9</td>
<td>5.4</td>
<td>3.4</td>
</tr>
<tr>
<td>2007</td>
<td>18,416,922</td>
<td>59.3</td>
<td>12.1</td>
<td>10.5</td>
<td>6.1</td>
<td>1.0</td>
<td>7.7</td>
<td>3.4</td>
</tr>
</tbody>
</table>

Source: Calculations derived from author's data base. See Chapter 2, Section 2.3, for sources.
Notes: 1 Students may select up to two ethnic categories. Therefore, the total percent does not necessarily add to 100.

2 Asian includes Native Hawaiian or other Pacific Islander.

3 Indian includes American Indian or Alaskan Native.
6.3. State-level findings

Tracing the patterns of enrollment at the nation-level sets the context for the study of enrollment across states, which is the second scale of geographical analyses. Enrollment grew considerably faster than CAPOP through the 1980s (Figure 6.2). Prior to the baby boom reaching college-age in the 1960s, there was negative growth in CAPOP. Marked increase in the percent change in enrollment growth between 1950 and 1970 was fueled by educational, federal, state, and demographic factors (see Chapter 3). The peak increase in CAPOP mirrored the peak surge in enrollment. Total enrollment continued to grow after 1980, but at a much slower pace than was evident in the pre-1980 period, while CAPOP declined during this time.

Figure 6.2. Percent change in total enrollment and college-aged population, 1939-2007
Sources: See Chapter 2, Section 2.3. for enrollment data sources. Population data are from Minnesota Population Center (2004).
As in Chapter 5, the LQ is used herein to explore the nexus between enrollment and population. LQ analyses were conducted using the following equation:

\[
LQ (\text{CAPEPOP}) = \frac{\text{Enrollment in STATE}}{\text{CAPEPOP in STATE}} \div \frac{\text{Enrollment in the U.S.}}{\text{CAPEPOP in the U.S.}}
\]

The LQ findings revealed over- or under-representation in the concentration of enrollment relative to CAPOP at the state level. The same scales were used to classify results as were introduced in Chapter 5, Section 5.3. State-level LQ values for total enrollment displayed the greatest heterogeneity at the start of the study period (Figure 6.3.). In 1939, nineteen states showed under-represented LQ values, twenty-one states possessed neutral LQ values, and eleven states featured over-represented LQ values. After 1939, the number of states demonstrating neutral LQ values increased, while the number of states exhibiting over- or under-represented LQ values declined. By 2007, forty-two states (82 percent of all states) exhibited neutral, four states displayed under-represented, and five states observed over-represented LQ values for total enrollment.

Three key trends are evident in the state-level analyses of the concentration of enrollment relative to CAPOP between 1939 and 2007. Firstly, there was a tendency toward neutral values for enrollment relative to CAPOP for the majority of states. On average, thirty-two states (63 percent of all states) observed LQ values in the neutral category, meaning that the ratio of enrollment to population within those states was within expected ranges. The number of states reporting neutral LQ values for total enrollment doubled between 1939 and 2000; twenty-one states observed average LQ values for total enrollment in 1939, while forty-four states possessed average LQ values for total enrollment in 2000.
Figure 6.3.: Concentration of total enrollment, by state, 1939-2007

- Under-represented (< 0.80)
- Neutral (0.80 - 1.20)
- Over-represented (> 1.20)

Source: Calculations derived from author’s database (see Chapter 2, Section 2.3).
The distribution of total enrollment relative to CAPOP was more uniform than was the distribution of IHE relative to CAPOP (see Chapter 5, Section 5.3.). Specifically, by the end of the study period, twice as many states (forty-two states) observed neutral LQ values for total enrollment than showed neutral LQ values for all IHE (twenty states). The variation in neutral LQ values for indicates that the distribution of enrollment closely followed the distribution of CAPOP in the U.S. at the end of the study period. In general, the overall trend toward stable LQ values for total enrollment reflects the growing massification of U.S. higher education in the 1960s and 1970s. The influx of baby boomers into IHE (see Chapter 3, Section 3.5.), the rise of the two-year college movement (see Chapter 4, Section 4.4.3.), and the growing size of IHE (see Chapter 4, Section 4.4.1.) all contributed to increased opportunities for students to attend IHE. Growing accessibility translated into a stabilization of enrollment relative to CAPOP for the vast majority of states.

Secondly, while the majority of states trended toward neutral LQ values for enrollment, a cluster of states in the South was under-represented in terms of the concentration of enrollment relative to CAPOP for most of the study period. However, Georgia was the only state to possess under-represented LQ values for all years. Under-represented values in the U.S. South persisted even after the 1970s massification of higher education. Thirdly, in contrast to the IHE LQ analyses (see Chapter 5, Section 5.3.), only one place—the District of Columbia—displayed over-represented LQ values for enrollment relative to CAPOP for the entire study period. Rhode Island possessed over-represented LQ values for enrollment from 1980 to 2007. Early over-representation of enrollment relative to CAPOP in California declined to neutral values by 1990, as growth in CAPOP out-paced enrollment growth in the state.
The preceding analyses provide insight into the changing spatial concentration of enrollment relative to CAPOP across states. Addressing state-level variations in enrollment by institutional type extends the understanding of spatial variations in the provision of U.S. higher education between 1939 and 2007. In the subsequent sections, the LQ is used to measure the concentration of enrollment relative to CAPOP across LEVEL (Section 6.3.1.) and CONTROL (Section 6.3.2.).

6.3.1. Location quotients by LEVEL

Conducting LQ analyses across LEVEL reveals more precise spatial patterns of four- and two-year enrollment between 1939 and 2007. LQ analyses across LEVEL were conducted using the following equations:

\[
\begin{align*}
\text{LQ}_{\text{Four}}(\text{CAPOP}) &= \frac{\text{Four-year enrollment in STATE}}{\text{Four-year enrollment in the U.S.}} \times \frac{\text{CAPOP in STATE}}{\text{CAPOP in the U.S.}} \\
\text{LQ}_{\text{Two}}(\text{CAPOP}) &= \frac{\text{Two-year enrollment in STATE}}{\text{Two-year enrollment in the U.S.}} \times \frac{\text{CAPOP in STATE}}{\text{CAPOP in the U.S.}}
\end{align*}
\]

Whereas LQ analyses for total enrollment (see Section 6.3.) showed a trend toward neutral values in the concentration of enrollment relative to CAPOP, uniformity of LQ values was not achieved for LQ across LEVEL. There were clear spatial and temporal variations in the concentration of enrollment in four- and two-year IHE relative to CAPOP at the state level. The number of states within each of the three LQ ranges—under-represented, neutral, and over-represented—varied markedly for enrollment in four- and two-year IHE throughout the study period.

In terms of four-year enrollment, twenty-two states (43 percent) had neutral LQ values, eighteen states (35 percent) had under-represented LQ values, and eleven states (21 percent) had over-represented LQ values relative to CAPOP in 1939 (Figure 6.4.).
Figure 6.4.: Concentration of four-year enrollment, by state, 1939-2007

- Under-represented (< 0.80)
- Neutral (0.80 - 1.20)
- Over-represented (> 1.20)

Source: Calculations derived from author’s database (see Chapter 2, Section 2.3).
The percentage of states with neutral LQ values of enrollment in four-year IHE remained relatively consistent throughout the study period. However, there was a marked decline in the percentage of under-represented states; by 2007, just seven states (14 percent) exhibited under-representation of four-year enrollment relative to CAPOP. Moreover, there was wide variation in LQ values for individual states during the focal period. Just three states—the District of Columbia, Massachusetts, and Utah—displayed high LQ values of enrollment in four-year IHE over the entire study period. Only Mississippi observed low LQ values for all of the study years.

Two spatial patterns are apparent LQ values for enrollment in four-year IHE. Firstly, early under-representation of enrollment in four-year IHE in the southeastern U.S. had reached neutral levels for most states by 2007. Secondly, population growth associated with the boomlet (see Chapter 3, Section 3.5.2.) contributed to the under-representation of enrollment in four-year IHE relative to CAPOP in California and Texas. Similarly, California and Texas were under-represented in terms of four-year IHE for the majority of the study period as well (see Figure 5.3.).

The LQ analyses of enrollment in two-year IHE yielded more consistent spatial patterns than did the LQ analyses of enrollment in four-year IHE. Throughout the study period, more states were under-represented in the concentration of two-year enrollment relative to CAPOP than were either neutral or over-represented (Figure 6.5.). Between 1939 and 1970, an average of thirty-six states (71 percent of all states) were under-represented in terms of two-year enrollment. After 1970, the number of states with neutral LQ values for two-year IHE rose. Consequently, after 1970, there was a decline in under-representation of states in terms of two-year enrollment; an average of twenty-six states (51 percent of all states) were under-represented in two-year enrollment between 1980 and 2007.
Figure 6.5.: Concentration of two-year enrollment, by state, 1939-2007

- Under-represented (< 0.80)
- Neutral (0.80 - 1.20)
- Over-represented (> 1.20)

Source: Calculations derived from author's database (see Chapter 2, Section 2.3).
The dramatic increase in the number of students attending two-year IHE after 1970 (see Chapter 4, Section 4.4.3.) translated into more states possessing neutral ratios of two-year enrollment relative to CAPOP.

The geography of states with high concentrations of enrollment in two-year IHE relative to population was predominantly western. California and Arizona displayed high LQ values for two-year IHE for the entire study period, while Washington exhibited high values between 1949 and 2000, Oregon possessed high values between 1970 and 1990, and New Mexico had high values after 1990. California was an early adopter of two-year IHE, and Arizona experienced marked growth in two-year IHE in the 1970s. However, strong population growth in California after 1960, Oregon after 1970, Washington after 1980, and Arizona after 1990 exceeded growth in the number of two-year IHE there (see Figure 5.4.).

The low concentrations of two-year enrollment contrast with the maps of LQ for two-year IHE (see Figure 5.4). Whereas the states of Montana, North Dakota, South Dakota, Missouri, Tennessee, Indiana, Ohio, Pennsylvania, New Hampshire, and Maine all displayed over-representation of two-year IHE relative to CAPOP in 2007, all of those states possessed under-representation of two-year enrollment relative to CAPOP. The disparity between these two LQ findings indicates that the two-year IHE within those states have smaller enrollments than would be expected. For example, in the case of Pennsylvania, the majority of two-year IHE were private, for-profit and private, non-profit, which tend to be smaller than their public counterparts (except in the case of the University of Phoenix).

6.3.2. Location quotients by CONTROL

Analyses of enrollment relative to CAPOP across institutional CONTROL provide an additional component for understanding to U.S. higher education between 1940 and 2000.
LQ analyses across CONTROL were conducted using the following equations:

\[ \text{LQ}_{\text{Public}}(\text{CAPOP}) = \frac{\text{Public enrollment in STATE}}{\text{CAPOP in STATE}} / \frac{\text{Public enrollment in the U.S.}}{\text{CAPOP in the U.S.}} \]

\[ \text{LQ}_{\text{NP}}(\text{CAPOP}) = \frac{\text{Private, non-profit enrollment in STATE}}{\text{CAPOP in STATE}} / \frac{\text{Private, non-profit enrollment in the U.S.}}{\text{CAPOP in the U.S.}} \]

\[ \text{LQ}_{\text{FP}}(\text{CAPOP}) = \frac{\text{Private, for-profit enrollment in STATE}}{\text{CAPOP in STATE}} / \frac{\text{Private, for-profit enrollment in the U.S.}}{\text{CAPOP in the U.S.}} \]

Analyzing variations in the concentration of students enrolled in public, private, private, non-profit, and private, private, for-profit IHE relative to CAPOP within states augments the preceding nation-level findings by increasing the spatial specificity of results.

Public IHE enrolled the greatest number of students throughout the study period (see Table 6.3.). Similarly, a greater number of states displayed neutral concentrations of public enrollment relative to CAPOP (53 percent) than contained neutral concentrations of either private, non-profit (20 percent) or private, for-profit (7 percent) enrollment relative to CAPOP between 1939 and 2007. In addition, the number of states which were either under- or over-represented in terms of public enrollment relative to CAPOP decreased over time, while the number of states exhibiting neutral LQ values grew to forty states (78 percent of all states) by 2007 (Figure 6.6.). The trend toward neutrality of LQ for public enrollment by 2007 is not surprising, given the mission of public IHE.

Despite a trend toward stabilized LQ values, there were consistent patterns in both the under- and over-representation of public enrollment relative to CAPOP between 1939 and 2007. There were two key areas of under-representation of public enrollment relative to CAPOP during the study period. First, an area of under-representation of public enrollment in the South was nearly corrected by 2007. In contrast, there was an over-concentration of public IHE (see Figure 5.5.) in the South, which means that public IHE tended to be smaller than expected in the South.
Figure 6.6.: Concentration of public enrollment, by state, 1939-2007

- Under-represented (< 0.80)
- Neutral (0.80 - 1.20)
- Over-represented (> 1.20)

Source: Calculations derived from author’s database (see Chapter 2, Section 2.3).
Second, there was a consistently under-represented cluster of states in Connecticut, the District of Columbia, Massachusetts, New York, and Pennsylvania after 1980. In New York, there was under-representation of both public enrollment and IHE (see Figure 5.5.) for the majority of the study period.

States displaying over-representation of public enrollment were most likely to be in the West. The western concentration of high public LQ was pronounced in the early part of the study period; in 1939, Alaska was the only state in the West region (see Table 2.1.) to have an LQ value outside the over-represented zone for public IHE. Over-representation of public enrollment was found in two states (i.e., Arizona and Kansas) for 1939 to 2007, three states in all years except 1980 (i.e., New Mexico, North Dakota, and Wyoming), and one state in all years except 1990 (i.e., California). Whereas LQ analyses of public IHE (see Figure 5.5.) revealed under-representation in California relative to CAPOP in 2000 and 2007, LQ analyses of public enrollment revealed over-representation in those years. Thus, California public IHE were larger than expected in terms of enrollment relative to CAPOP.

While LQ values for total and public enrollment trended toward neutral values, LQ values for enrollment in private, non-profit IHE were predominantly low (Figure 6.7.). An average of thirty states (58 percent of all states) was under-represented in the concentration of private, non-profit enrollment relative to CAPOP for the study period. In 1939, five states (i.e., Alaska, Arizona, Hawaii, New Mexico, and Wyoming) did not contain any private, non-profit enrollment. Wyoming was the only state with zero private, non-profit enrollment for the entire study period. In addition, few states displayed neutral LQ values for private, non-profit enrollment.
Figure 6.7.: Concentration of private, non-profit enrollment, by state, 1939-2007

Under-represented (< 0.80)  Neutral (0.80 - 1.20)  Over-represented (> 1.20)

Source: Calculations derived from author’s database (see Chapter 2, Section 2.3).
Six states were over-represented in terms of private, non-profit enrollment relative to CAPOP for the duration of the focal period: Connecticut, the District of Columbia, Massachusetts, New Hampshire, New York, and Rhode Island. Iowa and Pennsylvania were over-represented after 1949, Illinois was over-represented after 1980, and Missouri was over-represented in every year except 1970. The consistent over-representation of private, non-profit enrollment relative to CAPOP reinforces earlier discussions that the Northeast and Midwest had an early and a continued advantage in establishing private, non-profit IHE (see Chapter 3, Section 3.4.2. and Chapter 5, Section 5.3.2.). The strong presence of private, non-profit IHE translated into over-representation of private, non-profit enrollment in the Northeast and Midwest. However, the ratios of private, non-profit enrollment to CAPOP were not as pronounced as the ratios of private, non-profit IHE (see Figure 5.6.) in the Midwest, which could mean that the private, non-profit IHE had smaller enrollments in Midwest states.

In contrast to the discernable patterns of enrollment in private, non-profit and public IHE, mapping the concentration of enrollment in private, for-profit IHE relative to CAPOP revealed stark contrasts (Figure 6.8.). During the focal period, an average of nearly thirty-nine states (75 percent of all states) were under-represented in terms of enrollment in private, for-profit IHE relative to CAPOP in any given year. However, the comparatively small numbers of students enrolled in private, for-profit IHE before 1980 (see Table 6.3.) limit the accurate interpretation of LQ findings prior to that time. By 2007, only two states (i.e., Delaware and Montana) had yet to establish any private, for-profit IHE. The number of students attending private, for-profit IHE increased more than elevenfold between 1980 and 2007.
Figure 6.8: Concentration of private, for-profit enrollment, by state, 1939-2007

- Under-represented (< 0.80)
- Neutral (0.80 - 1.20)
- Over-represented (> 1.20)

Source: Calculations derived from author’s database (see Chapter 2, Section 2.3).
Pennsylvania was over-represented in private, for-profit enrollment between 1980 and 2000. Six states were over-represented in terms of private, for-profit enrollment relative to CAPOP between 1980 and 2007: Arizona, Colorado, Florida, Minnesota, South Dakota, and West Virginia. By 2007, Arizona had more than 286,000 private, for-profit students, the majority of which were enrolled in the University of Phoenix Online Campus, most likely in locations outside Arizona. California had more than 123,000 private, for-profit students in 2007, but was under-represented in private, for-profit enrollment relative to CAPOP.

6.4. Point-level findings

The preceding discussion of state- and nation-level analyses yields new insights into the changing spatial scope and scale of U.S. higher education enrollment between 1939 and 2007. This point-level examination concludes the analyses of changes in higher education enrollment over space and through time. The hot spot analysis spatial statistics tool within ArcMap™ (Esri® Inc., 2013) was used to calculate the Getis-Ord \( G'_i \) statistic for total enrollment. The results of the \( G'_i \) analyses were classified and mapped using the same scales introduced in Chapter 5, Section 5.4. (Figure 6.9.).

Just as the \( G'_i \) findings for IHE revealed (see Chapter 5, Section 5.4.), the \( G'_i \) results for enrollment did not uncover any statistically significant “cold” spots. In addition, the number of statistically significant z-scores increased dramatically for both enrollment and IHE over the course of the study period. In 1939, there were 43 statistically significant z-scores. By 2007, the number of statistically significant z-scores had risen to 231.

\footnote{Future analyses will examine \( G'_i \) for enrollment by LEVEL and CONTROL of institution.}
1.65 \leq z \leq 1.96
1.96 < z \leq 2.58
z > 2.58

Figure 6.9: Distribution of G* statistics for total enrollment in IHE, 1939-2007

\( \triangle \) 1.65 \leq z < 1.96
\( \triangle \) 1.96 < z \leq 2.58
\( \blacksquare \) z > 2.58

Source: Calculations derived from author’s database (see Chapter 2, Section 2.3).
Larger z-score values indicate more intense clustering of values. In 1939, the largest z-score for enrollment was 16.5, which was higher than any z-scores for IHE. There was greater visible clustering of z-scores for enrollment than for IHE (see Figure 5.8.), particularly in the early part of the study period. For example, in 1939, there were clusters of statistically significant z-scores of enrollment around the Great Lakes and the eastern seaboard. Over time, the “hot” spots of enrollment within the Great Lakes and along the eastern seaboard became more numerous. After 1960, significant enrollment “hot” spots emerged in the West and South U.S., particularly near major cities. The maximum value of enrollment z-scores had declined to 6.7 by 2000, but rose to 26.7 in 2007 due to the massive enrollment of the University of Phoenix Online Campus (see Table 4.7.).

There was an absence of statistically significant enrollment z-scores in the upper Mountain states (see Table 2.1.). In addition, more states were lacking statistically significant z-scores for enrollment (i.e., 10 states) than for IHE (i.e., 5 states). There were no statistically significant “hot” spots of enrollment in Alaska, Arkansas, Maine, Mississippi, Montana, New Hampshire, North Dakota, South Dakota, Vermont, and Wyoming by 2007. Mississippi, North Dakota and Wyoming were the only states which observed non-significant z-scores for both enrollment and IHE. Alaska, Arkansas, Maine, Montana, New Hampshire, South Dakota, and Vermont displayed significant clustering of IHE, but not enrollment. Future analyses will examine enrollment within states to see how variations are related to the size, LEVEL, and/or CONTROL of IHE.
6.5. Summary for enrollment

The nation-, state-, and point-level analyses for enrollment revealed key changes in the numbers and types of enrollment between 1939 and 2007. At the national level, the total number of students rose from nearly 1.5 million students in 1939 to more than 18.4 students in 2007 (see Table 6.1.). The dramatic increase in the numbers of students between 1939 and 2007 can be attributed to many factors, including the G.I. Bills enabling veterans to attend IHE (see Chapter 3, Section 3.3.4.1.), a large WWII baby boom cohort (see Chapter 3, Section 3.5.2.), and a trend of females delaying marriage and/or entering college at later ages (see Chapter 3, Sections 3.5.3.2 and 3.5.3.3.). In addition, the rise of two-year IHE (see Chapter 4, Section 4.4.3.) contributed to growing numbers of nontraditional students from the 1960s onward (see Chapter 3, Section 3.5.3.3.). Two-year IHE grew at a faster rate than four-year IHE in all years except 2007 (see Table 6.2.). The tremendous growth of The University of Phoenix Online Campus from 14,783 students in 2000 to 224,880 in 2007 contributed to a 25 percent growth in four-year enrollment between 2000 and 2007.

There also were key changes in institutional CONTROL which impacted enrollment in IHE between 1939 and 2007. The rise of two-year IHE contributed to the massification of higher education, and the increasing role of public IHE in U.S. higher education (see Chapter 4, Section 4.4.). Public enrollment in IHE grew from 54 percent of total enrollment in 1939 to nearly 74 percent of total enrollment in 2007. Private, non-profit enrollment declined from 46 percent of total enrollment in 1939 to 20 percent of total enrollment by 2007. Whereas private, for-profit IHE accounted for 24 percent of all IHE by 2007, enrollment in private, for-profit IHE represented less than 7 percent of total enrollment. Most private, for-profit IHE were smaller than their public counterparts, except The University of Phoenix Online Campus, whose enrollment was 18 percent of all private, for-profit enrollment in 2007.
At the state level, there was a greater variation in the concentration of total enrollment relative to CAPOP at the start of study period. As total enrollment grew, LQ values for total enrollment stabilized, and more than 80 percent of states displayed neutral concentrations of enrollment relative to CAPOP by 2007 (see Figure 6.3.). In other words, total enrollment was represented in relatively equal proportion to CAPOP for most U.S. states by the end of the study period. Public enrollment trended toward stabilization by 2007 as well (see Figure 6.6.). Western and southern states could not “catch up” with private, non-profit IHE (see Figure 5.6.) and enrollment (see Figure 6.7.). However, some western states made up for the lack of private, non-profit enrollment with over-representation of public (see Figure 6.6.) and two-year enrollment (see Figure 6.5.).

At the point level, as in the IHE analyses, no “cold” spots of enrollment were detected in the $G_i^*$ analyses. The results of $G_i^*$ analyses (see Figure 5.9.) exhibited greater clustering of statistically significant z-score values than were apparent for IHE (see Figure 5.8). Seven states (i.e., Alaska, Arkansas, Maine, Montana, New Hampshire, South Dakota, and Vermont) exhibited significant clustering of IHE, but not enrollment. Five of these states (i.e., Arkansas, Maine, Montana, South Dakota, and Vermont) had either negative or below-average growth in CAPOP between 1940 and 2000. Future research will examine the variations between z-scores for enrollment and IHE within states across LEVEL and CONTROL.

This chapter concludes Part II, which contained analyses historical, descriptive, and statistical analyses of higher education history, IHE, and enrollment. Chapters 4, 5, and 6 provided different layers of analysis into the changing geography of U.S. higher education. Each of the chapters stands alone in terms of the significance of their findings. The combination of the three chapters, however, fills a research void by analyzing the spatial distribution of IHE and enrollment across multiple spatial scales.
Part III

THE CONCLUSIONS
Chapter 7

CONCLUSIONS

Universities have played an important, if not decisive role in the shaping of culture and civilisation of present day societies. There are those who wonder whether the universities under the present conditions will be able to do so in the next century (van der Molen, 1996: 14-15).

7.1. Introduction

This dissertation is a historical, descriptive, and spatial analysis of higher education in the United States. There are three contributions of the dissertation. One contribution is developing the spatial database of IHE and enrollment (see Chapter 2). The second contribution is using the database to explore how the spatial patterns of higher education are connected to a series of educational, federal, state, and demographic factors (see Chapters 3 through 6). The dissertation addresses each of these contributions. A third contribution is long-term; the database will be publicly available to other researchers and policy makers in the future. The present chapter concludes the dissertation by summarizing the findings, addressing the limitations, and exploring the future directions of the research.

7.2. Findings

The dissertation definitively establishes that educational, federal, state, and demographic factors shaped U.S. higher education between 1939 and 2007. Findings from the history of higher education (Chapter 4) are examined temporally (Section 7.2.1.). Empirical findings for IHE and enrollment are reviewed by spatial scale of analysis (Section 7.2.2.).
7.2.1. Historical findings

Chapter 4 used literature review and maps of institution founding to examine higher education historically and spatially. The locations of early IHE were shaped by the nation’s population, technology, and transportation, as IHE were established in close proximity to navigable rivers, established ports, or major trade centers. The Dartmouth College Case of 1819 prompted the proliferation of private, non-profit IHE, particularly in the Northeast and Midwest U.S. By the time the first Morrill Act was enacted in 1862, IHE were dispersed throughout thirty-five states, five territories (i.e., in areas that later become Oklahoma, South Dakota, Utah, Washington, and West Virginia), and the District of Columbia (see Figures 4.2., 4.3., and 4.4.).

Two main factors contributed to even greater geographic dispersion of higher education between 1862 and 1940. First, changing economic conditions increased the importance of a higher education between 1862 and 1940 (see Chapter 3, Section 3.2.). Second, two federal forces contributed to the expansion of higher education between 1862 and 1940 (see Chapter 3, Section 3.3.). The Morrill Act of 1862 broadened the mission and geographic scope of U.S. higher education by establishing land-grant IHE in proportion to states’ populations, while the G.I. Bill of 1944 provided funding to WWII veterans to attend IHE as a means of demobilization.

Between 1941 and 2007, demographic processes were influential in increasing both total enrollment and student diversity, as IHE expanded their facilities and capacities to accommodate veterans after WWII and baby boomers in the mid-1960s. In addition, growing demand for higher education services spurred growth in institution founding, especially for public, two-year IHE in the 1960s and 1970s. Two-year IHE increased the academic, economic, and spatial accessibility of higher education. Demographically, two-
year IHE fostered a growing diversity of institutional enrollment across sex, ethnicity, and age which persists today. Finally, there were key changes in the types of IHE established based on CONTROL after WWII. The relative share of private, non-profit IHE as a percentage of all IHE declined steadily between 1949 and 2007, while the percentage of public IHE grew markedly until 1980 (see Table 5.3.). After 1980, the only CONTROL group that was increasing in its percentage of all IHE was private, for-profit IHE. The increased diversity of institutional types by CONTROL is a important component to understanding U.S. IHE since WWII.

7.2.2. IHE and enrollment findings

Traditional (e.g., LQ) and spatial (e.g., G^*) statistical analyses for IHE and enrollment were conducted across the nation, state, and point levels. The nation-level findings both reinforce and expand upon the patterns identified in Chapter 4 for IHE and enrollment. Specifically, the nation-level analyses uncovered a significant structural change in both LEVEL and CONTROL for IHE and enrollment between 1960 and 1980. In terms of LEVEL, both the number of two-year IHE (see Table 5.2.) and students (see Table 6.2.) more than doubled between 1960 and 1970. The rise of two-year IHE contributed to the massification of higher education, and the increasing role of public IHE in U.S. higher education (see Chapter 4, Section 4.4.). In terms of CONTROL, the ratio of public IHE relative to other IHE reached a peak in 1980, when public IHE accounted for 48 percent of all IHE (see Table 5.3.). Public enrollment also peaked in 1980, when public enrollment accounted for 78 percent of total enrollment (see Table 6.3.). Conversely, private, non-profit IHE accounted for 48 percent of all IHE, but only 21 percent of enrollment in 1980. The larger size and
greater accessibility of public IHE across educational, demographic, financial, and spatial lines propelled public IHE into a new trajectory that continued through 2007.

All states experienced growth in the numbers of IHE and enrollment between 1939 and 2007. The dramatic increase in the numbers of IHE and students may be attributed to many factors, including:

- the rising importance of a higher education (see Chapter 3, Section 3.2.),
- a large WWII baby boom cohort (see Chapter 3, Section 3.5.2.),
- an influx of veterans attending IHE under the G.I. Bills (see Chapter 3, Section 3.3.4.1.),
- a trend of females delaying marriage and/or entering college at later ages (see Chapter 3, Sections 3.5.3.2 and 3.5.3.3.), and
- the increasing financial opportunities for students to attend IHE using extensive grants and loans programs (see Chapter 3, Section 3.3.4.2.).

LQ analyses measuring the concentration of IHE and enrollment relative to CAPOP revealed that enrollment (see Figure 6.3.) was more uniformly distributed than IHE (see Figure 5.2.). By 2007, twice as many states (forty-two states) observed neutral LQ values for total enrollment than showed neutral LQ values for all IHE (twenty states). Thus, the concentrations of enrollment and CAPOP were closely aligned at the state level in 2007. Public enrollment was trending toward neutrality by 2007 as well (see Figure 6.6.).

State-level analyses reinforced the literature contention (see Chapters 3 and 4) of a Northeast and, often, Midwest, historical advantage in establishing private, non-profit IHE (see Figure 5.6.). Western (i.e., Arizona, California, Nevada, Oregon, and Utah) and southern (i.e., Florida and Texas) states could not catch up with the Northeast and Midwest in terms of establishing both private, non-profit and four-year IHE. Western states were able to compensate for the lack of private, non-profit IHE by establishing two-year (see Figure 5.4.) and public IHE (see Figure 5.5.). However, the numbers of public IHE could not keep pace with growing college-aged populations in the West (i.e., Arizona, California, Nevada) and South (i.e., Florida, Georgia, Texas). Two-year IHE were able to stabilize relative to CAPOP
in Arizona, California, Florida, and Georgia (see Figure 5.4). In addition, some western states made up for the lack of private, non-profit enrollment with the over-representation of public (see Figure 6.6.) and two-year enrollment (see Figure 6.5.).

At the point level, \( G_i^* \) analyses for IHE and enrollment revealed statistically significant "hot" spots. The absence of statistically significant "cold" spots for IHE and enrollment implies that there are no places within the U.S. with inadequate numbers of IHE or enrollment. Further \( G_i^* \) analyses across LEVEL, CONTROL, and within states is necessary to better understand point-level clustering of different types of IHE.

7.3. Limitations

While the dissertation successfully fills gaps in both geographic and higher education research, this dissertation neither can, nor does it attempt to be, exhaustive in terms of its scale and scope. There are two primary limitations of this research. First, data availability influenced the end date of analysis (see Chapter 2, Section 2.2.1.). At the time of the final data collection, the most recent institution-level higher education enrollment data available were for the 2007-2008 academic year. As the completion of the dissertation neared, enrollment data for the 2010-2011 academic year were published online (USDE, Institute of Education Sciences, National Center for Education Statistics, 2013). At a later date, adding the 2010-2011 institutional data to the database will be feasible. However, it was not practical to incorporate the newly-released data into the dissertation.

Second, since the empirical analysis of U.S. higher education from a spatial perspective has been minimal, this dissertation necessarily serves as an exploratory data analysis. Analyses of enrollment across SEX and ETHNICITY at the state and point levels were not included in the dissertation. In addition, point-level analyses of IHE and enrollment across
LEVEL and CONTROL were not incorporated herein. Therefore, although the dissertation contributes a much-needed spatial aspect to U.S. higher education, analyzing IHE and enrollment exhaustively was not possible within the dissertation due to scale and space constraints.

7.4. Future research

Since the spatial aspects of U.S. higher education remain under-examined outside of this dissertation, this research lays the groundwork for numerous future research endeavors. The value of the dissertation database is that new avenues of research have yet to be fully examined with its current data. Moreover, the database can and will be continually updated as new institutional and enrollment data become available. Three possibilities for future research using the database are examined herein.

First, the ideas of state-level spending and structural variations in higher education between states were introduced in Chapter 3 (see Section 3.4.). The complexity of examining fifty separate systems of higher education was beyond the scope and scale of this dissertation. However, the $G_t$ enrollment analyses noted the value of studying higher education variations within states (see Chapter 6, Section 6.4.). Case studies of variations in states’ spending and policies would uncover important information about IHE and enrollment over time at the state level. For example, future analyses could test Weerts, et al. (2012) assumption that lower public spending on higher education produces lower public enrollment in states. Moreover, a better understanding of spatial variations in higher education spending within states would benefit policy-makers and planners at the state- and institution-level.
Second, U.S. higher education traditionally has been place-based, in that the educational functions of IHE have occurred in a specific location. Relatively recent innovations in communications technologies have the potential to alter dramatically the role of place in higher education. In particular, virtual learning (i.e., distance learning, online learning, or e-learning) has the ability to remove place from the higher education equation; students are now able to take classes and earn a degree without ever setting foot on a traditional campus. The rapid rise of the University of Phoenix Online Campus from 14,783 students in 2000 to 224,880 in 2007 is a dramatic example of the rise of online learning. Specific analyses of the online providers in the dissertation database across LEVEL, CONTROL, and location will be key to understanding the growth and dispersion of online higher education providers.

Third, the dissertation has shown that providers of higher education have changed over time, in response different factors, including federal initiatives (i.e., the Dartmouth College Case, the G.I. Bills) and demographic trends (i.e., the baby boom, females delaying marriage). CONTROL of IHE shifted from predominantly private, non-profit in 1939 to nearly equal concentrations of private, non-profit (37 percent) and public IHE (38 percent) by 2007 (see Table 5.3.). Private, for-profit IHE increased in number dramatically between 1980 and 2007, to ultimately account for 24 percent of all IHE by 2007. The rise of private, for-profit IHE is not expected to slow in the near future. However, traditional IHE may grow more competitive with private, for-profit IHE by utilizing alternative techniques (i.e., larger virtual learning programs, expanded night classes). Using the database to explore how the CONTROL of IHE is impacted by current trends in higher education—such as escalating higher education costs and rising numbers of part-time and nontraditional students—will be important for IHE, policymakers, and states alike.
The dissertation database will inform these, and other, future inquiries into U.S. higher education. Geographers are uniquely equipped to use the dissertation database to explore current trends and speculate about future trends. Releasing the database publicly to a broader audience will enable education scholars, social science researchers, and policy makers to further expand the spatial study of U.S. higher education as well.
Appendix A

INSTITUTIONAL ACCREDITATION

The responsibility for the control or supervision of educational institutions in the United States is not concentrated at any single level of government or in any public or private body or agency. Varying degrees of control are exercised by each State, but institutions of higher education operate with considerable autonomy and self-governance. Therefore, U.S. educational institutions vary widely in the character and quality of their programs (Center for Statistics, 1986: vii).

In the United States, accreditation may occur either at the program or institutional level. Program-level accreditation assesses occupational or professional fields (i.e., engineering, law, medicine, veterinary science) on the "quality of the professional preparation of . . . students" [Council for Higher Education Accreditation (CHEA), 1996: 4]. While program-level accreditation focuses on particular disciplines, institutional accreditation is broader in scope. Institutional accreditation serves as a way of promoting and maintaining high academic standards, as a means of guiding prospective students and their parents, as a mechanism for ensuring that academic credits are transferrable between IHE, and as a signal to the larger community that an institution has satisfied certain criteria. Specifically, institutional accreditation

focuses on the college or university as a whole and directs attention not only to the educational program but to such areas as effective management, student and personnel services, financial and physical resources, administrative strength, and consumer protection (Christal and Jones, 1985: 1).

In the U.S., IHE are accredited at the institutional level by eight regional accreditation agencies within six geographic regions (Table A.1.).
Table A.1: Regional accreditation agencies and their constituent states

<table>
<thead>
<tr>
<th>Region</th>
<th>Agency name(s)</th>
<th>States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Middle States</td>
<td>Middle States Association of Colleges and Schools, Commission on Higher Education (MSACHE)</td>
<td>Delaware, District of Columbia, Maryland, New Jersey, New York, Pennsylvania</td>
</tr>
<tr>
<td></td>
<td>New England Association of Schools and Colleges, Commission on Technical and Career Institutions (NEASCTC)</td>
<td></td>
</tr>
<tr>
<td>North Central</td>
<td>North Central Association of Colleges and Schools, Commission on Institutions of Higher Education (NCACHE)</td>
<td>Arizona, Arkansas, Colorado, Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, New Mexico, North Dakota, Ohio, Oklahoma, South Dakota, West Virginia, Wisconsin, Wyoming</td>
</tr>
<tr>
<td>Northwest</td>
<td>Northwest Association of Schools and Colleges, Commission on Colleges (NWASC)</td>
<td>Alaska, Idaho, Montana, Nevada, Oregon, Utah, Washington</td>
</tr>
</tbody>
</table>
Table A.1.: Regional accreditation agencies and their constituent states (continued)

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<th>States</th>
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</thead>
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<td>Southern</td>
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<td>Kentucky, Louisiana,</td>
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<td></td>
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<td>Mississippi, North Carolina,</td>
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<td>South Carolina, Tennessee,</td>
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<td></td>
<td></td>
<td>Texas, Virginia</td>
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<tr>
<td>Western</td>
<td>Western Association of Schools and Colleges, Accrediting Commission for Community</td>
<td>California, Hawaii</td>
</tr>
<tr>
<td></td>
<td>and Junior Colleges (WASCJC)</td>
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<tr>
<td></td>
<td>Western Association of Schools and Colleges, Accrediting Commission for Senior</td>
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<tr>
<td></td>
<td>Colleges and Universities (WASCSR)</td>
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### Appendix B

#### DATABASE VARIABLES

<table>
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<tr>
<th>Variable type</th>
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<th>Variable explanation</th>
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<td>Identification</td>
<td>UNITID</td>
<td>Unique institutional identifier</td>
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<tr>
<td></td>
<td>NAME</td>
<td>IHE name</td>
<td>Changes noted in database as appropriate</td>
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<tr>
<td>Institutional characteristics</td>
<td>ESTAB</td>
<td>Year established</td>
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<td></td>
<td>CLSD</td>
<td>Date closed, if applicable</td>
<td></td>
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<tr>
<td></td>
<td>ACCRED</td>
<td>Date accredited</td>
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<tr>
<td></td>
<td>SECTOR</td>
<td>Sector of institution</td>
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<td></td>
<td>UNIQUE</td>
<td>IHE with special classifications</td>
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<tr>
<td></td>
<td>NORACE</td>
<td>No race identified enrollment</td>
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</tr>
<tr>
<td>Population</td>
<td>Description</td>
<td>Years</td>
<td></td>
</tr>
<tr>
<td>------------</td>
<td>----------------------------------------------------</td>
<td>-----------</td>
<td></td>
</tr>
<tr>
<td>NORACEM</td>
<td>No race identified male enrol.</td>
<td>2007, 2000, 1990</td>
<td></td>
</tr>
<tr>
<td>NORACEF</td>
<td>No race identified female enrol.</td>
<td>2007, 2000, 1990</td>
<td></td>
</tr>
</tbody>
</table>

Sources: See Chapter 2, Section 2.3. for sources.


Kiester, E., Jr. 1994. Uncle Sam wants you... to go to college. *Smithsonian* 25(8): 128-139.


VITA

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Education

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Research


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Selected Awards and Distinctions

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Selected Conference Presentations


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