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Undergraduate Education Value: A Comparative Analysis of China and the United States

Alexandra Allman
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Walden University

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Alexandra Allman

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Walden University
2021

Abstract

Undergraduate Education Value: A Comparative Analysis of China and the United States

by

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MA, University of Texas at Dallas, 2011

BA, University of Rochester, 2009

Proposal Submitted in Partial Fulfillment of the

Requirements for the Degree of

Doctor of Philosophy

Public Policy and Administration, Global Leadership

Walden University

May 2021

Abstract

Within the international higher education community there is not a system nor *gold standard* to identify the value of higher education institutions (HEIs). For the current research, the definition of value was determined through quantitative methods considering utility and cost. The research problem underscored the importance of valuing undergraduate education in the United States and China, from a comparative perspective. A credible link was established that provided evidence to preserve the value indicator as an international standard within the HEI community. The study's purpose was to define the value of undergraduate education and create an international standard through a comparative analysis of China and the United States. Conceptual frameworks for the research included Thaler's Transaction Utility Theory (TUT). The key research questions inquired upon differences in value with 4-year public accredited universities in China and the United States, and if relationships existed with previous published variables of value from the same datasets. The nature of the study was quantitatively focused using secondary data. Variables included: employment, earnings, cost, value, alumni, award, cited researchers, papers published, and papers indexed in social science citations. The research systemically included a two-population *t*-test and multiple regression. Three major findings and analytical results included: (1) validation of an international value standard, (2) differences in HEI value, and (3) positive and significant relationships between United States awards- United States value. The contribution to positive social change includes understanding academic valuation in terms of public policy and administration.

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Dedication

My dedication is in two parts. First, I was only able to work through this entire journey of my Bachelor's degree through my published dissertation because of Him.

Second, this dissertation is dedicated to my family-immediate and extended. Each and every one of you influenced me in your own manner during this season. With the stability, support, and love of my family, I was able to work throughout these years to accomplish becoming the first female, biracial, first-generation graduate with a disability from a lower socioeconomic background who is now the *first doctor* in my family. It was not until the last phase of my academic journey, did I realize how meaningful of an accomplishment had I made for an individual like myself; as statistically, the success rates are far and few between. So in that spirit- it was not without the encouragement and unwavering support of my husband, that I enrolled to finish up the last phase of my academic journey. Thank you for your “nudge” and for being by my side every day during my Ph.D. years.

And from my childhood, there were a couple of special people that consistently encouraged me which transcended into my academic path. Where one of the most influential members of the Allman family that inspired me was my Grandma B. Grandma B. had nine children. After her ninth child, her husband died from a heart attack. Grandma B. raised all nine children on her own and never remarried. She proudly talked about being a cadet nurse during WWII, ER nurse, and nurse of our high school. Grandma B. did right by her children where all of them contribute to society in a positive

manner. Grandma B. was one of the couple inspirational women us grandchildren looked up to.

Last but not least was my father, who like his own father, served his country proudly. He then had four children, me as his oldest. He worked very hard as an entrepreneur to provide for his children. Something I always remember him saying was he just didn't want us kids feeling insecure like he felt growing up. Grandma B. did as much as she could with what she had, but, my father wanted us to have better opportunities than what he had and truly worked hard to provide for them.

My contribution to my family is becoming a doctor. And, it is my hope that our future generations in the Allman family and my little Allman-Thompson *go further* and *do better* than all of us.

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Table of Contents

List of Tables	vii
List of Figures.....	ix
Chapter 1: Introduction to the Study	1
Background of Study	1
Problem Statement.....	2
Purpose of Study.....	4
Research Questions and Hypothesis.....	6
Conceptual Framework for the Study.....	7
Nature of Study.....	9
Definition of Terms	10
Assumptions	13
Scope and Delimitations	14
Limitations.....	15
Significance of the Study.....	15
Summary.....	16
Chapter 2: Literature Review	18
Introduction	18
Literature Search Strategy	18
Conceptual Framework	21
The Cost Factor (C).....	22
The Value Factor (V).....	23

The Utility Factor (U).....	25
Conventional Higher Education Value Factors	28
The Alumni Factor	29
The Awards Factor	29
The HiCi Factor	29
The N&S Factor	30
The PUB Factor	30
Why the China Comparison?.....	31
History of HEIs.....	32
Global Perspective of HEIs and Value	34
United States HEI History	37
China HEI History	40
Secondary Effects of HEIs	43
History of HEI Accreditation	44
Global HEI Accreditation.....	44
United States HEI Accreditation	46
China HEI Accreditation	50
Comparative Analysis of United States versus China HEIs in the Literature	53
Global Comparison.....	53
Best Practices.....	54
Less than Best Practices	56
Research Questions in the Literature.....	60

Value Differences Between Undergraduate Degrees for Accredited Public 4-Year Universities: China and the United States	61
Value Differences Between Undergraduate Degrees for Accredited Public 4-Year Universities in China and the United States on Cost and Utility.....	63
Value Differences Between Undergraduate Degrees in China and the United States on alumni, award, HICI, N&S and PUB.....	69
Measures of Effectiveness in HEI	70
Conclusion.....	71
Chapter 3: Research Methodology	73
Introduction	73
Research Design and Rationale	74
Methodology.....	76
Population.....	76
Sample Size and Sampling Procedures	77
Data Collection.....	79
Instrumentation and Materials	83
Operationalization	85
Data Analysis Plan	87
Threats to Validity	91
Internal Validity.....	91
External Validity	91

Construct Validity	92
Ethical Procedures	92
Summary.....	92
Chapter 4: Results.....	94
Introduction	94
Data Collection.....	94
Research Question 1	96
Data Results and International Value Standard.....	96
Data Results and Two-Population <i>t</i> -Test.....	99
RQ1 Findings.....	100
Research Question 2	101
Data Results and Multiple Regression	101
United States Multiple Regression	102
United States Multiple Regression Findings	104
China Multiple Regression.....	108
China Multiple Regression Findings	111
Comparison of United States and China HEI Regression Variables.....	114
Summary.....	115
Key Findings	115
Chapter 5: Summary, Conclusion, and Recommendations	117
Introduction	117
Research Question 1	118

Interpretation of Finding International Value Standard	118
Interpretation of Finding Two-Population <i>t</i> -Test	118
Research Question 2	119
Interpretation of Finding Multiple Regression	119
Conceptual Framework Analysis	120
Limitations of Study	123
Reliability	124
Policy Recommendations	124
International Policy Recommendation	125
United States Policy Recommendations.....	125
China Policy Recommendations.....	127
Implications	129
Methodological, Theoretical, and Empirical Implication.....	130
Social Change Recommendations for Practice.....	131
Conclusion.....	132
References	133
Appendix A: Permission Letters in Redacted Format.....	159
Appendix B: Research Questions and Hypotheses	179
Appendix C: China and United States Comparable	180
Appendix D: HEI Standard Comparison Questions.....	181
Appendix E: Earnings.....	182
Appendix F: Degrees and the Economy	183

Appendix G: Family Income and Degrees	184
Appendix H: Multiple Regression United States Residual Output	185
Appendix I: Multiple Regression China Residual Output.....	186

List of Tables

Table 1	<i>Variables for Higher Education Value Standard</i>	5
Table 2	<i>A Synthesis of Theories to Compare HEIs</i>	27
Table 3	<i>Conventional Higher Education Value Factors</i>	28
Table 4	<i>Timeline of Higher Education Development</i>	33
Table 5	<i>United States Regional Accrediting Association</i>	47
Table 6	<i>United States Accreditation Process</i>	48
Table 7	<i>Data collection method</i>	80
Table 8	<i>Variable categorization and nomenclature U.S.</i>	85
Table 9	<i>Variable categorization and nomenclature China</i>	86
Table 10	<i>Data analysis plan</i>	90
Table 11	<i>Participants and Sample Size</i>	95
Table 12.	<i>International Value Standard Data U.S.</i>	96
Table 13	<i>International Value Standard Data China</i>	97
Table 14	<i>Two-population t-test</i>	99
Table 15	<i>Data for United States Multiple Regression to Predict HEI International Value Standard</i>	102
Table 16	<i>United States Multiple Regression “R’s”, “Standard Error” and “Observation”</i>	103
Table 17	<i>ANOVA United States</i>	103
Table 18	<i>United States Multiple Regression Predicting HEI International Value Standard</i>	104

Table 19	<i>United States VIF Data</i>	107
Table 20	<i>Data for China Multiple Regression to Predict HEI International Value Standard</i>	108
Table 21	<i>China Multiple Regression “R’s”, “Standard Error” and “Observation”</i>	109
Table 22	<i>ANOVA China</i>	110
Table 23	<i>China Multiple Regression Predicting HEI International Value Standard</i> ...	110
Table 24	<i>China VIF Data</i>	113

List of Figures

Figure 1. U.S. Accreditation System	49
Figure 2. Structure of Evaluation System in China	53
Figure 3. International Value Standard Comparison	98
Figure 4. P-P Plot for U.S. Regression	108
Figure 5. P-P Plot for China Regression.	114

Chapter 1: Introduction to the Study

Higher education institutions (HEIs) acknowledged that there is a value connected to the 4-year public undergraduate degree. Value was an international question that affected all HEIs. The international HEI community did not have an international value standard, gold standard, global standard, universal standard, or value index that identifies and defines value. Nonetheless, HEIs across the globe consistently assessed their value through outputs such as the quantity of bachelor's degrees awarded, and higher education grades as a whole.

Studies based on value revealed little attention towards HEI value and quantification; and, the academic body of literature did not present an "HEI international value standard." In this study, I created an HEI international value standard. The countries of China and the United States were the quantitative comparative analysis component forming the foundation of this research.

Background of Study

HEIs did not have an international value standard; this was evidence of a gap in the literature. The purpose of this research was to address this gap. This study was necessary because, within the higher education community, the value of an undergraduate education was considered necessary by both customers and academic providers. Historically, the term value had conflicting definitions with the shared consensus that it is critical for the institutions output and survival (Lee & Raschke, 2018; Amir, Auzair, Maelah, & Ahmad, 2016; Daromes, 2015; Barron, 2017; Susilo, 2016; Lai, To, Lung, and

Lai, 2012; Hamid, Mustafa, Suradi, Idris, & Abdullah, 2012; Milla, Martin & Van Bellegem, 2016).

Bernhard (2012) focused on an international higher education comparative analysis addressing tuition; Zha (2011) focused on comparing the massification of higher education using the countries of China and the United States. Ryan (2016) defined accreditation and the role of accreditation agencies; Ramirez (2015) explained that accreditation agencies in the United States all have different rules and standards, specifically international institutions. Guangli (2016) explained the accreditation process in China. There was a social problem within the HEI community as to how it operated without a set international standard. The lack of a HEI international standard led to conflicting and confusing tuition policies, deregulated and confusing accreditation policies, under-employment and unemployment outcomes, and conflicting earning rates. Therefore, the current value for a 4-year public undergraduate degree under the current social conditions were inconsistent with the present global community.

Problem Statement

Within the international higher education community, there was no system or *gold standard* to identify the value of higher education institutions (HEI). Lacking an *international value standard* created a problem for the United States and Chinese HEIs' internal and external stakeholders as there was no international global measuring system akin to the metric system. There were many definitions of value. For this study, I used the definition given by Mihram and Murphy (2008), that value was determined through quantitative methods by taking utility and dividing it by cost. With this approach, utility

was identified as a numeric ratio function used for statistics where cost and utility were measured (Upton & Cook, 2014). There was a need to quantify the value of higher education because provided empirical evidence of the benefits chosen over the associated costs. The global community required measurable evidence of the utility of higher education and the value it created. A measurable way to compare the relative value of higher education among competitive entities was also needed. The value system contributed to the literature by providing an understanding of the benefits of an undergraduate education versus the comparative cost. Included in this study, was a comparative element between the two countries of China and the United States. It was determined if value matters within the global community, and why.

The literature on higher education and value was extensive and covered themes such as academic values, educational values, organizational values, culture values, perceived value, material value, and value competition. For example, educational values, in terms of outcomes, contain perceived educational worth, affordability, class size, and entrance standards (Lee & Raschke, 2018). In contrast, perceived worth was identified as consumption value with categories such as functional value, social value, and emotional value (Lai, To, Lung, & Lai, 2012). In this study, I addressed the lack of an international value indicator to measure higher education institutions. The international value indicator provided the ability to quantify the value of HEIs.

The United States and China each provided their own set of standards to accredit their HEIs (Ryan, 2015; Ramirez, n.d.; Guangli, 2016). Ultimately, the value of higher education in the United States was somewhat regulated through outside authorities such

as regional and state-sponsored accreditation agencies. The accreditation agencies, for example, had the authority to accredit or strip the HEI of its credentials if it was not compliant with its rules and standards; an action known as punishment (Chen, Ramamurthy, & Wen, 2013). The Chinese government required a similar procedure for undergraduate education, where the HEIs underwent a review for quality accreditation through a compulsory regulation under the Ministry of Education Higher Education Evaluation Centre (Shuiyun, 2016). Therefore, the research problem underscored the importance known about the United States and Chinese HEIs concerning undergraduate education by filling the gap of its *value* within the context of existing literature. A credible link was established, that provided evidence to retain the value indicator as the international standard within the HEI community.

Purpose of Study

The purpose of this study was to define the value of undergraduate education, and create an international value standard through a quantitative comparative analysis of China and the United States. There were many studies on the value of higher education; however, there was a gap in the literature that did not address a quantitative comparative approach of these themes (Zha, 2011; Bernhard, 2011). In this study, I used secondary data of the United States and China available via open sources. The dependent variable for the study was value for both the United States and China, as defined in a general sense labeled as USV and CV, respectively. There were multiple independent variables for the study. The first was cost (the price of a 4-year undergraduate degree) labeled as USC and CC. The second was utility (employment rate and earnings rate) labeled as

USEMR, CEMR, USERR, CERR. The third was Alumni labeled as USAL and CAL. The fourth was award labeled as USAW and CAW. The fifth was the Number of highly cited researchers labeled as USHI and CHI. The sixth was the Number of papers published in nature and science labeled as USNS and CNS. Finally, the seventh was the Total number of papers indexed in science citation index-expanded and social science citation index labeled as US PUB and CPUB. Refer to Table 1 for a general menu of variables used in this research:

Table 1

Variables for Higher Education Value Standard

Variable name	Variable Label
U.S. Employment Rate	USEMR
U.S. Earning Rate	USERR
U.S. Cost	USC
U.S. Alumni	USAL
U.S. Award	USAW
U.S. Number of Highly Cited Researchers	USHI
U.S. Number of Papers Published in Nature and Science	USNS
U.S. Total Number of Papers Indexed in Science Citation Index-Expanded and Social Science Citation Index	USPUB
U.S. Value	USV
China Employment Rate	CEMR
China Earning Rate	CERR
China Cost	CC
China Alumni	CAL
China Award	CAW
China Number of Highly Cited Researchers	CHI
China Number of Papers Published in Nature and Science	CNS
China Total Number of Papers Indexed in Science Citation Index-Expanded and Social Science Citation Index	CPUB
China Value	CV

Note: Variable titles were used exclusively by the research approach.

Research Questions and Hypothesis

The problem I addressed in this study was the lack of an *international value standard* for HEIs across the globe, including the United States and China. I designed the research questions to explore the validity of the value of higher education in the United States and China as being the same or different. The value USV and CV of HEIs were determined by taking utility and dividing it over cost. The independent variables were cost (USC and CC) of an undergraduate degree and utility (USEMR, CEMR, USERR, and CERR), which included employment rate and earnings rate. In the second part of the research, I attempted to determine the most influential variables that explain the difference or similarity using the independent variables: USAL, CAL, USAW, CAW, USHI, CHI, USNS, CNS, USPUB, and CPUB.

RQ1: To what extent if any is there a difference in value between undergraduate degrees for accredited public 4-year universities in China and the United States between 2009–2019?

RQ2: Do relationships exist between or among the variables alumni, award, HiCi, N&S, PUB, and value from public 4-year universities in China and the United States between 2009–2019?

First Hypothesis:

H₀: The differences in value between undergraduate degrees for accredited public universities in China and the United States are equal.

H₁: The differences in value between undergraduate degrees for accredited public universities in China and the United States are unequal.

Conceptual Framework for the Study

The conceptual framework I used for this study was based on the seminal works of Roels' (2010) value transaction theory (VTT), Thaler's (1983) transaction utility theory (TUT), and decision rules from the cost-utility analysis of Ginsberg, Somekh, and Schlesinger (2018). Both the VTT and TUT were theories that are not within the public policy school of thought. The foundation of Roel's theory is based on statistical thermodynamics and information theory. It may seem counterintuitive to use theory from physics for public policy. However, information theory discussed statistical entropy, also known and described as disorder (Grady, Jr., 2008). The VTT contained two major laws that were first used for statistical thermodynamics and later rewritten so commercial markets and industries could apply them. The first rewritten law states,

"true value is a conserved quantity; transactions cannot result in the generation of true value. The second law states that transactions result in the creation of statistical entropy, and free-value can only be gained if it is exchanged within this environment" (Roels, 2010, p. 32).

In other words, free-value is value calculated with less significant information, while true-value is calculated with all information.

The VTT was relevant to undergraduate education for many reasons. The first notion, conserved quantity, indicated that the transaction of undergraduate education was being protected from the true value. The VTT posited a higher likelihood of a transactional disorder for higher education where free value is only achievable if it is released. The VTT was vital for the overall comparison of the United States and China,

for the same foundational argument of the transactions of HEIs and their true value. The same goes for the transaction disorder for the United States and China's HEIs, where the free value will only be achievable when released.

Thaler (1983) created the TUT, which used the market price (the price of the good/product when sold) and reservation price (the lowest point at which the good/product will be negotiated) to measure value through utility. The market price and reservation price were used to gauge the customer's happiness in consideration of the perceived value of the product (Thaler, 1983).

The TUT was relevant to undergraduate education for many reasons. The first reason was the concept of the undergraduate market price and the undergraduate reservation price, which all stakeholders must consider. Another reason the TUT was relevant to undergraduate education was that the theory can be used as a foundation to gauge the happiness of the customers—in this case students—considering the perceived value of their product: education.

Both Duvetorp, Levin, Mattsson, and Rytting (2019) and Ginsberg, Somekh, and Schlesinger (2018) used the cost utility analysis and applied decision rules to their studies. Duvetorp et al. (2019) used cost utility analysis and rules to study psoriasis. The rules were applied to the treatment decision of ointment or foam. The decision paths were created based on the success rate (non-success rate) and release rates throughout 12 weeks (Duvetorp et al., 2019). Ginsberg et al. (2018) cost utility analysis, and decision rules were based on the immunizations against respiratory syncytial virus. More specifically, based on the data available the established rules were *very cost effective* and

cost effective if their variable was less than the per capita gross domestic product (GDP) \$35,329-\$105,987 (Ginsberg et al., 2018, p. 2-3). If the variable was three times more than the per capita GDP, it was considered *not cost effective* (Ginsberg et al., 2018, p. 2-3). Decision rules were crucial for the international value standard. Once an international value standard was created, decision rules can be applied in this this research study to examine the HEIs' effectiveness.

Nature of Study

This was a quantitative comparative analysis study. The first phase of the study calculated the international value standard. The variables chosen for the United States and China HEIs were the following: the higher education costs for an undergraduate degree and the associated utilities of employment rate and earnings rate. The focus of HEI value and its influence on HEI costs were consistent with Bernhard's (2012) effort to compare countries from a price perspective. Choosing a comparative analysis of higher education institutions with the countries of the United States and China for locations conformed to Johnstone (2003) research and facilitated the research theme on value of higher education. Finally, there were no covariates for this research study.

The referenced data sets of employment rate were secondary and collected from the United States Bureau of Labor Statistics website for the United States data and the Statista website for the China data (Databases, Tables & Calculators by Subject, n.d.; Share of employed people in the Chinese population from 2009 to 2019, n.d.). The datasets were analyzed using Microsoft Excel. The referenced data sets of earning rate were secondary and collected from the United States Census Bureau for the United States

data and the National Bureau of Statistics of China website for the China data (Income and poverty in the United States 2018, 2020; Annual by province, n.d.). The datasets were analyzed using Microsoft Excel. The referenced datasets of cost were secondary and collected from the Digest of Education Statistics 2014 for the United States data and the ebook Higher Education in China for China's data (National Center for Education Statistics, 2014; Gu, J., Li, X., Wang, L., 2018). All referenced datasets were collected into a master data folder.

The second phase of the study was a two-population *t*-test. Value will already have been calculated for 2009–2019 for both the United States and China. Value will be considered the dependent variable, specifically USV and CV. The independent variables chosen to assess if there was a difference in value were: USC, CC, USEMR, CEMR, USERR and CERR.

The third phase of the study was a multiple regression. That methodology was chosen to assess why there was a difference in value (as the dependent variable). The independent variables chosen were as follows: USAL, CAL, USAW, CAW, USHI, CHI, USNS, CNS, US PUB, and CPUB. The referenced data was secondary and was collected from the Academic Rankings of World Universities website (Academic Rankings of World Universities 2019, n.d.). The datasets were analyzed using SPSS and Microsoft Excel. All referenced datasets were collected into a master data folder.

Definition of Terms

I used the following terms for this study:

Accreditation: Tabrizi and Farahsa (2015) defined accreditation as a procedure in identifying the quality of an institution or a study program, where it was evaluated by a private or a state-independent actor to certify that it met specific and pre-determined standards (p. 5). I assumed that all HEIs used for the United States and China were properly institutionally accredited.

Alumni: Alumni had a diversity of meanings. Alumni provided the option to showcase the depth and breadth of individuals who have graduated from a particular organization or institution. For purposes of this study alumni included graduates from bachelors and beyond who have obtained the Nobel Prizes and Field Medals from higher education institutions.

Award: Awards are provided to recognize particular achievements that individuals, teams, organizations and/or institutions have accomplished. For purposes of this study, awards signified staff within the higher education institution who have obtained the Nobel Prizes and Field Medals.

Cost: Cost was defined as public tuition from public 4- year institutions in the United States (Hemelt & Marcotte, 2016). I used the average cost of a 4-year degree from a HEI in China or the United States.

Government: In this study, I examined government from the perspective of a communist regime and a democracy. Welch (1989) explained that communism has two dimensions, which included actors and subjects of action; where Karl Marx (1996) explained in the Communist Manifesto that everything should be equally owned and shared. Lijphart (1999) explained that Robert Dahl's definition of democracy from

polyarchy is as follows: (a) the right to vote, (b) the right to be elected, (c) the right of political leaders to compete for support and votes, (d) elections that are free and fair, (e) freedom of association, (f) freedom of expression, (g) alternative sources of information and, (h) institutions for making public policies dependent on votes and other expressions of preference.

Higher education: Higher education had a variety of meanings. Higher education provided the option of brick-and-mortar institutions or online and hybrid programs across the globe. Higher education also underscored different degrees such as bachelor's, master's, doctorates, professional (JD's, MBA's), and certificates. Likewise, higher education included different classifications of study, such as natural science (i.e., biology), social science (i.e., political science and economics), and humanities (i.e., religion), as examples. For purposes of this study, I defined higher education as a completed bachelor's degree from a public 4-year higher education institution).

Higher Education Institution: Liu and Dai (2012) explained that HEIs were universities and colleges and they were their own businesses and had the quality to internationalize. I defined an HEI for this study as a 4-year public institution that is fully accredited and validated to provide undergraduate degrees from either the United States or China.

The Number of Highly Cited Researchers aka HiCi: I conducted this research so that it could be shared with the world and for it to have a positive impact. One way to share the research was for researchers to become highly cited through different analytic databases. One of the databases included Clarivate Analytics.

The Number of Papers Published Indexed in Science Citation Index-Expanded and Social Science Citation Index PUB: Scholarly indices provided a robust and purposeful manner for data research to populate. PUB indicated the number of papers published from the Science Citation Index-Expanded and Social Science Citation Index.

The Number of Papers Published in Nature and Citation Index-Expanded N&S: The purpose for scholarly indices were to conglomerate research in a purposeful and strategic manner. N&S helped to indicate the amount of papers published from the Nature and Citation Index.

Utility: The body of literature provided a range of descriptions for utility (Thaler, 1983; Witt, 2016; Mao, Hu, and Liu, 2018). This study used : (a) the employment rate of both China and the United States which will include recent graduates from public 4 year universities, and (b) the earnings rate of both China and the United States which will include recent graduates from public 4 year universities.

Value: The body of literature presented various articles from separate schools of thought on value (Porter, 2009; Maab & Grundmann, 2018; Chen, Liu, & Huang; 2016). This study was based on the quantitative measurement of value equals utility divided by cost (Mihram & Murphy, 2008; Resnick, Tosteson, Groman, & Ghogawala, 2014).

Assumptions

The first assumption was that the public open-source and HEI data used for this research were all current and accurate. The second assumption considered the open-source to represent the true variables of cost and utility of the sample HEIs of China and the United States. The third assumption used for this study was that the best method to

create the international value standard was utility divided by cost. The fourth assumption used was the best representation for utility was earnings and employment rate. The fifth assumption was that all HEIs from China and the United States in the dataset were from "accredited" universities.

Scope and Delimitations

Burkholder, Cox, and Crawford, (2016) defined the scope as a group in which the study is applied and/or the population which is being researched. The scope of this study included all 4-year public higher education institutions in the United States and China from 2009 through 2019. The study's approach was a quantitative comparative analysis and assumed that it was the best approach in determining value of undergraduate education within a framework of a comparative analysis. The study did not include any other HEIs outside of the countries of China and the United States. The countries of China and the United States were chosen for numerous reasons some of which included the major differences in their government and policies, the population amount ranked by country and position of power as a global leader. The variables alumni, award, HiCi, N&S and PUB were chosen to assess why there was a difference in value through a multiple regression. The study did not include any other secondary data outside of one decade of datasets. Potential issues of internal validity were maturation and selection which were described in depth within Chapter 3 Research Methodology. A potential issue of external validity was setting which was described in depth within Chapter 3 Research Methodology. The potential of generalizability was not applicable.

Limitations

One limitation of the selected data was the quality of the data as it is from secondary sources. Since the data was secondary, definitions of the variables may not be the same from all of the original studies combined, which may have created a validity and reliability issue. However, the planned purpose, and how the secondary data were used, were equally as important (Burkholder, Cox, & Crawford, 2016). Due to the study using quantitative methods and the data being secondary, there was mitigation for any potential research bias during the study. Due to limited resources, such as time and budget, the logical and feasible option available was using secondary data. A second limitation for the selected data were that there was not a true dataset of an HEI international value standard, enabling a comparison and contrast. A reasonable measure for this limitation was to provide data from one decade to include 2009 through 2019. However, I was able to use the methodology of a two-population *t*-test and multiple regression for the international value standard. There were no confounder variables.

Significance of the Study

The research filled a literature gap by focusing specifically on the development and exercise of an academic-based value indicator. It defined what the value of an undergraduate higher education was, and then provided a comparative analysis for the countries of China and the United States. Ultimately, the research provided a framework to identify an international standard for assessing the value of higher education. This dissertation was unique because it addressed an under-researched area within the higher education literature, whereas previous research focused more on a country's specific

problem areas concerning higher education (Lee & Raschke, 2018; Louis, 2016; Wang, 2013). The study also provided secondary effects of HEIs, such as economic and national security. The results of this study also provided much-needed insights into the descriptive data by which undergraduate HEI systems were evaluated. Insights from this study should aid students, stakeholders, and HEI decision-makers with evidence-based material for individualized decisions, public policies, and public administration. These same factors also contributed and provided the impetus for positive social change. Therefore, this research was able to describe ultimately why there is a difference in value between the United States and China's HEIs and this will be through the variables of alumni, award, HiCi, N&S and PUB. Once this was established, HEIs can make data driven decisions to change their value if they see fit and individuals can make decisions about their HEIs value based on the variables making changes for themselves if they see fit.

Summary

This research provided an international value standard on HEIs; specifically, between HEIs in China and the United States. The standard can help inform the valuation of an academic undergraduate degree and provide a foundation to form better public policies and administration of higher education. There was a gap in the academic literature defining value for undergraduate education. The research was quantitatively focused with secondary data from multiple sources. The implications for social change included the stakeholders of the HEIs and the consumers who are students. After developing the international value standard, HEIs can now have a different perspective

on how to compete, their product, and how to drive investors. Likewise, the State should have an interest in the international value standard, as there will be long-term social-change implications for national security. Such effects included the economy on the domestic front and on the international front by HEIs production output through its students.

Chapter 2 will provide an overall literature review of HEIs, synthesizing main ideas. All requested permission of reprinted tables and figures can be found in Appendix A. Chapter 3 will then draw upon the methodology chosen, which includes multiple regression and two-population t -test. Chapter 4 will present the data analysis results. Finally, Chapter 5 will present findings and interpretations, including positive social change implications.

Chapter 2: Literature Review

Introduction

When analyzing higher education and HEIs, there were always common questions, such as: "what is the value of a bachelor's degree" or "what is the value of higher education?" These questions usually fell within the parameters of one specific State in the United States, foreign country, or select region. HEIs lacked an international value standard, gold standard, global standard, universal standard, or value index, and HEIs needed to quantify the value output they provided. Therefore, the gap in the literature was the lack an international value standard. This study created an HEI international value standard, using the countries of China and the United States as the basis of a quantitative comparative analysis. In Chapter 2, I presented a critical review of the extent literature, primarily focusing on the components of HEIs, the lack of an international value standard involving the United States and China. Chapter 2 began with a history of HEIs. The chapter included a general review of the history of HEI accreditation. Then a comparative analysis of the United States and China were presented. Next, the research questions in the literature were reviewed and discussed. The measures of effectiveness in HEIs were also analyzed, followed by a conclusion.

Literature Search Strategy

The literature search strategy for the dissertation process was paramount. I documented each step meticulously and strategically. For purposes of this research, I used a Microsoft Excel spreadsheet that contained 12 column titles counting information

such as APA citation of the article, keywords, and theoretical frameworks. I documented each article in the spreadsheet.

For this literature review, I used both databases and search engines. A database is an information repository while a search engine combines and searches multiple information repositories. I used a search engine each time using keywords derived from initial literature reviews. After reviewing the search engine results with the keywords, I then searched particular databases associated with the original search. I conducted this iteration with repetition numerous times to ensure a complete and thorough search of relevant literature related to the research problem.

I used the following databases to complete a comprehensive search of references, sources, and information: SocioINDEX with full text, Academic Search Complete, Social Sciences Citation Index, Education Source, International Security and Counter-Terrorism Reference Center, Expanded Academic ASAP, ERIC, Emerald Insight, ScienceDirect, Science Citation Index, Directory of Open Access Journals, ProjectMUSE, Business Source Complete, Supplemental Index, Journals@OVID, Arts & Humanities Citation Index, PSYCInfo, and Complementary Index.

I used the following search engines and sites for the literature review: China's Ministry of Education, The United States Department of Education, David D. Dill's Personal Website through UNC, Shenzhen University Website, The United Nations, The United Nations Educational, Scientific and Cultural Organization (UNESCO), Google Scholar, Postsecondary Value Commission, and The European Association for Quality Assurance in Higher Education.

I used the following key search terms and keywords: *History of higher education in the United States, History of higher education in China, Higher education institutions and value, Higher education and value, Higher education and comparative and United States, Higher education institutions and comparative and China, History of higher education in the United States, Higher education institutions and accreditation and United States, Higher education institutions and accreditation and China, Guangdong Province, China, accreditation, ministry of education, China and ministry of education and standards, Universities OR colleges OR higher education and value and undergraduate degrees and accreditation and China or United States, Higher education and value OR worth OR utility and degree OR undergraduate and China, Higher education and value OR worth OR utility and degree OR undergraduate and China and employment rate, Higher education and degree OR undergraduate and United States and employment OR job OR position, Higher education and value OR worth OR utility and degree OR undergraduate and China and earnings rate, Higher education degree and United States and earning OR income, Cost utility analysis, Value transaction and economy, History of HEI, Higher education institutions and comparative and international, Utility theory or utility variable AND economics OR econometrics OR economy and utility function AND economics OR econometrics, Value and alumni, Value and award, Value and highly cited paper, Value and publish, Value and index and higher education, Alumni and HEI, Award and HEI, Highly cited and HEI, Publish OR published and HEI, and Total number of papers index.*

The literature search was extensive. One strength was access to the Walden Library database, The University of North Carolina Chapel Hill Library database and the University of Maryland Global Campus database. Access to the three library databases provided for more information on HEIs, especially when it came to China. In the same context, one weakness of this dissertation was solely access to United States library databases. Therefore, the perspective of this dissertation was from a United States point of view.

Conceptual Framework

The core conceptual framework for this research was based on the idea of value. The conceptual framework was a better fit for this study than a theoretical framework. This was based on Imenda (2014) conceptual framework that explained the abstract idea of value. In contrast, had I chosen a theoretical framework, it would have required a set definition and a systematic point of view with a relationship of variables outlying a blueprint (Imenda, 2014). The value of HEIs for this study was determined by taking *utility* defined as earnings and employment and dividing it over cost. A blend of theoretical principles were applied, such as Roels' (2010) VTT, Thaler (1983) TUT, and decision-tree modeling through cost-utility analysis. The chosen theories worked best for the methodology as the research design was modeled on a quantitative non-experimental correlational research design, where the variables were measured and not manipulated. For this study, I reviewed the academic literature to interpret common themes and/or discrepancies that may have arisen.

The Cost Factor (C)

Yuen, Wang, Wong, and Zhou (2018) created the anchoring theory by blending three different theories: the perceived value theory, the social exchange theory, and the transaction cost theory. By the authors combining the referenced theories, it enabled them the ability to analyze the relationship between sustainable shipping practices and shipper's loyalty. Taking the logic of the anchoring theory and applying it to higher education institutions, the was applicable as it considered customer utility, social psychology, and institutional economics. The theory can also be applicable for HEIs because it can be used centering around customer utility, social psychology, and institutional economics as those themes are all tenants within HEIs. Yuen et al. (2018) used factor analysis for their findings to assess sustainable shipping. The factor analysis included a cost-utility analysis, decision trees, and transaction costs (Yuen, et al., 2018). Again, by applying Yuen et al.'s (2018) concepts to HEIs, it would be strategically analyzed through the same effort of cost-utility analysis, decision trees, and transaction costs.

The topic of decision rules were a common theme I found throughout the body of literature, where a subtopic included cost-utility analysis. Decision rules can be applied to this study's utility-cost analysis after the formation of the HEI international value standard. Duvetorp, Levin, Mattsson, and Rytting (2019) used a decision tree model within Microsoft Excel to conduct a cost-utility analysis of two different drugs for psoriasis. The researchers then used sensitivity and base-case analyses for a 12-week treatment regimen. Ginsberg, Somekh, and Schlesinger (2018) used cost-utility analysis

with Microsoft Excel to analyze the immunizations against respiratory syncytial virus. The Gross Domestic Product (GPD) provided the foundation for the model's decision rules. The product was labeled "very cost-effective" and "cost-effective" if it was below the per capita GDP or between one and three, and considered "not cost-effective" if the cost was more than three times the GDP per capita (pp. 2–3). Dawoud, Wonderling, Glen, Lewis, Griffin, Hunt, Stansby, Reed, Rossiter, Chahal, Sharpin, and Barry (2018) used a decision tree model for the first 90-days, then a Markov decision tree which provided disease state options to conduct a cost-utility analysis to measure elective total knee replacement venous thromboembolism and total knee replacement venous thromboembolism. The authors used base case analyses and sensitivity analyses. For this study, applied decision rules to the international value standard. Once the international value standard was created, the rules were used to analyze the HEIs as compared to the relevant literature discussed.

The Value Factor (V)

Porter (2009) expounded a value-based system for health care; it was one that provided universal insurance and a restructuring of the health-care output system. All stakeholders within the higher education system may use this universal education ideology to restructure the input and outputs of the system. Maab and Grundmann (2018) used the value chain from the circular economy, action arenas and action situations, and the theory of transaction cost economics in order to analyze the agriculture wastewater reuse scheme in Germany. Chen, Liu, and Huang (2016) used value creation theory, transaction cost theory, and the resource-based view of the firm to analyze patent

litigation. Chen et al. then used path analysis to determine outcomes. The VTT was used to analyze true value and free value, where this study applied it to focus on free value; value calculated with less critical information while true value calculated uses all information (Roel's, 2010). Statistical entropy was part of VTT as it defined the amount of information that was lacking by quantification, and showed information was not a free commodity and comes with a cost. Simply stated, entropy means to disintegrate. Roels (2012) refined VTT into economic value theory (EVT). The equation of VTT: $G_i = W_i - C_{II}i$, also known as $G = W - C_{II}$ for EVT. Where G_i is the free value of asset I, W_i is the intrinsic or the true value of asset i, CI is the cost of information, I_i is the statistical entropy of asset i. (Roels, 2012). The VTT and EVT translated into an HEI formula would be W_i as a true-value measured with all HEI information, CI measured with the cost of HEI, and I_i statistical entropy measured as disorder within the HEI. The Roels (2012) equations and variables would be very difficult to convey with the chosen research questions.

This study was based on the quantitative measurement of value as being utility divided by cost (Mihram & Murphy, 2008; Resnick, Tosteson, Groman, & Ghogawala, 2014). Mihram and Murphy (2008) used the equation of value (utility/cost) to explain how patients appreciated the difference between price and value. The factors of utility included finances, times, and morbidity costs (Mihram & Murphy, 2008, p. 272). Resnick et al. (2014) also used the equation of utility divided by cost for value as it relates to the health industry, specifically spine care.

The Utility Factor (U)

The concept of utility within the academic literature varied. Thaler's (1983) seminal piece developed the TUT. The TUT used the market price and reservation price to show how happy the customer was by the perceived value of the product (Thaler, 1983). For example, if an individual expected to pay \$5,000 for a college degree but found in their financial aid package a grant for \$3,000, they gained the utility of the degree and an additional \$2,000. The TUT also explained buying behaviors with regards to discounts and buying behavior with regards to expensive products (Thaler, 1983).

Witt (2016) explored the history of utility. Utility began with Bentham's analysis of utility quantified through pleasures and pains (Witt, 2016). Jevon added to the body of literature by indicating that utility was a commodity; it was a one-dimensional variable and that feelings belonged to decision-makers, which were not possible to interpret (Witt, 2016, p. 214,). Edgeworth and Fisher's Pareto's utility theory described the "utility function" and Lancaster's characteristics approach (Witt, 2016). Mao, Hu, and Liu (2018) analyzed utility through the mathematical lens of the classic utility model within behavioral economics using: utility-based shortfall model and rank dependent expected utility model (RDEU). Each model had its unique mathematical equation attempting to determine the notion of risk-sharing, and measuring it in a quantifiable manner, by agents within the market (Mao, Hu & Liu, 2018).

Lisciandra (2016) examined utility with an interdisciplinary approach of psychology and economics as a means to understand social preferences. One theme of utility (expected utility theory) highlighted individuals' beliefs and desires, another self-

interest rationality and utility maximization, while another was interdependent utility functions to study philanthropic and altruistic behavior (Lisciandra, 2016). Khalilzadeh and Wang (2017) analyzed utility through attitude and motivation using the coalition game, which contained transferable utility. The coalition games offered players a set of options, such as the ability to cooperate, negotiate, bargain, and collude; where members knew the rules and payoffs, and members could negotiate sharing utilities, attitudes, and ideas (Khalilzadeh & Wang, 2017, pp. 15-17).

Table 2

A Synthesis of Theories to Compare HEIs

Name of Theory	Factors	Author	Methodology
Anchoring Theory	Value & Cost	Yuen, Wang, Wong, & Zhou (2018)	Cross-sectional Survey Questionnaire
Value Chain from the Circular Economy & Transaction Cost Theory	Value & Cost	Maab & Grundmann (2018)	Qualitative/Case Study
Decision Tree Model	Cost Utility Analysis	Duvetorp, Levin, Mattsson, & Rytting (2019); Ginsberg, Somekh, & Schlesinger (2018)	Quantitative/Cost-Utility analysis Quantitative/Cost-Utility analysis
Value based system for health care	Value	Porter (2009)	Qualitative
Value Transaction Theory	Value Utility	Roels' (2010) Witt (2016)	Quantitative
Utility based shortfall model; Rank Dep. expt. utility (RDEU) model	Utility	Mao, Hu & Liu (2018)	Quantitative
Expected utility theory; utility maximization; interdependent utility function	Utility	Lisciandra (2016)	Qualitative
Utility; coalition game	Utility	Khalilzadeh and Wang (2017)	Quantitative
Transaction Utility Theory	Utility	Thaler (1983)	Quantitative

Note: Variable titles were used exclusively by the research approach.

Supported by Table 1, the cost variable worked best for the research as it provided evidence-based concepts to connect the cost-utility analysis, along with decision-tree rules, to the cost variable of higher education institutions. The value variable worked best for the research as it connected the concept of value-based universal systems and the value transaction theory to the concept of the value variable for higher education institutions. The utility variable also worked best for the research as it connected the concept of utility theory, utility-based shortfall model, and the RDEU model to the utility variable of higher education institutions. Each of the cited theories attempted to capture value, utility, and cost from a conceptual framework. As can be seen, it was difficult to

use a specific formula for the chosen research questions. Due to this, the conceptual framework was a better choice than a theoretical approach. For purposes of this research, value was measured as utility divided by the average cost of HEIs in China and the United States.

Conventional Higher Education Value Factors

The following section provided an overview of the five higher education value factors: alumni, awards, the Number of highly cited researchers, the Number of papers published in nature and citation index-expanded and the Number of papers published indexed in science citation index-expanded and social science citation index. It was through the five conventional higher education factors that the international value standard was defined.

Table 3

Conventional Higher Education Value Factors

Name of Theory	Factors	Author	Methodology
Alumni Satisfaction Model	Alumni	Hsu et al. (2016)	Quantitative
ALTRIS	Alumni	Mijic and Jankovic (2014)	Quantitative
Inductive data analysis strategy for themes	Awards	Mitten and Ross (2018)	Qualitative/Interviews
Theming with categories	Awards	Lowe and Shaw (2019)	Qualitative
Own HiCi Ranking	HiCi	Bornmann and Bauer (2014)	Quantitative
Input/Output for Inst. Quality	HiCi	Micceri (2005)	Quantitative
“Publish or perish” & low quality work	N&S	Ertas and Kozak (2020)	Mixed
Motivational, other social, economic or none	N&S	Lambovska and Yordanov (2020)	Mixed
QLA	PUB PUB	Woten and Pilgrim (2017)	Quantitative
SSI	PUB	Social Support Index (2002)	Quantitative

Note: Variable titles were used exclusively by the research approach.

The Alumni Factor

The body of literature defined and highlighted alumni in different ways. Hsu et al. (2016) reflected it through the alumni satisfaction model. This model was based off of the Customer Satisfaction Index and built to measure and analyze different parts of the higher education institution such as experience, courses and environment (Hsu et al., 2016). Mijic and Jankovic (2014) argued that alumni took on an important role as it related to HEIs through information communication technologies for employment and personal information (p. 1156). The information retrieved about alumni assisted HEIs in making data driven decisions (Mijic & Jankovic, 2014, p. 1156). Data specifically gathered for Mijic and Jankovic (2014) was based on their ALTRIS theory and research instrument.

The Awards Factor

The awards factor had a plethora of meanings within the academic community. Research by Mitten and Ross (2018) supported that awards, as it related to HEIs, was undergraduate faculty receiving awards in the context of Teacher of the Year at a large southeastern research HEI (p. 1350). Lowe and Shaw (2019) categorized awards and HEIs with reference to students. Examples of this included students who taught and student research initiatives (Lowe and Shaw, 2019).

The HiCi Factor

Bornmann and Bauer (2014) used the Highly cited data from 2014 which was secondary and created their own ranking. The authors were able to add additional HEIs

to their unique ranking system (Bornmann & Bauer, 2014). Micceri (2005) processed Highly cited scholars as an output when rating the HEI quality.

The N&S Factor

Ertas and Kozak (2020) discussed the notion in the academic community of “publishing or perishing”. In other words, there was a driving competition for academics to publish their work which could benefit both the scholar and the HEI however, this could lead to low quality published work (Ertas & Kozak, 2020). Lambovska and Yordanov (2020) research found that the main components for academics publishing was collaboration, funding, financial assets, and to contribute to the academic community (p.188). This evidence showed that there was not one driving factor for academics when it comes to publishing.

The PUB Factor

The PUB factor was considered an index because it served as a measure and was also an indicator. When researching indices, the academic body of literature populated many indices for numerous typical areas. The Social Support Index for example, was an index because it used scoring similar to the Likert Scale with 17 items to answer (Social Support Index, 2002). Woten and Pilgrim’s (2017) Quality of Life Assessment was an additional example of an index because it had two sections with 33 items each. The first section asked the patient about satisfaction vs dissatisfaction and was given a score. After the entire QLA was completed by the respondent the researcher was able to add up the scores based on the index (Woten and Pilgrim, 2017).

Why the China Comparison?

In the present-day global pecking order, China is one of the leading players. "Of the top 100 companies in the world, China and Hong Kong have 21 of them" (Rapoza, 2018, para. 8). A second tangible example of China's global position is through the United Nations Security Council UNSC. The UNSC maintains 15 members, five of whom are permanent members, where China includes one of the permanent members. In other words, China has a seat at the global table with specific powers that include, but are not limited to, maintaining international peace, determining threats, and a 'vote' if action should be made with the council ("United Nations Security Council," n.d). The International Monetary Fund (IMF) reported that China has a population of 1.4 billion, and the Pew Research Center indicated that China had the world's largest population (Hackett, 2018). Because China has the world's largest population, it is at the forefront of sending the largest number of individuals to HEIs. The second-largest population was India, with 1.35 billion (Hackett, 2018). Finally, higher education was considered a matter of national security for China. For example, the Chinese Communist Party (CCP) has a policy in place for researchers who go overseas, where the researchers must check-in with the CCP or they will be suspended ("Authorized to release the issuance," 2019). For China, the State and how individuals deal with national security elements were through a blended (market economy) with communist government politics. The China HEI system followed the communist traditions of the State. Therefore, the referenced elements provided a foundation of why an universal value standard was needed, beginning with the inception of the United States and China.

The China comparison was essential for the research as it created the international value standard component of a semi-communistic state to the theory. Without bringing in a second country for the research, the standard would simply be a national value standard for HEIs. For this research, China was strategically chosen to create the international value standard due to its positions in the world. Likewise, China's rank of world's largest population was another dominant factor in creating the international value standard. See Appendix B for a simplistic comparison of the United States and China.

History of HEIs

The following section was based on the history of HEIs. First, it will examine the chronological history of HEIs, then it will analyze the Global Perspective of HEIs and their respective value. It will then critique the United States HEI history, followed by a focus on China's HEI history. It will end with a discussion on the secondary effects of HEIs.

Himanka (2015) explained that higher education and research currently has an "identity crises;" therefore, the logical treatment would be to revisit the "childhood" of higher education. The first step was to review the ancient history of higher education development through the lens of the Egyptians and Babylonians and then the Greeks. Himanka (2015) found that Egyptians and Babylonians educated only the privileged class of humanity; while under the Pythagorean Model in Athens, Greece, education included all citizens. Fuller (2018) examined how philosophy impacted the American university system. An example of this was the German philosopher Wilhelm von Humboldt's viewpoint of making the academic discipline of philosophy, the foundation of the liberal

arts program to develop students into citizens (Fuller, 2018, p. 36). Berthel (2017) analyzed the philosophy of Confucianism in the context of East versus West education and higher education. Eastern philosophy and education focused and continues to focus on the individual (Berthel, 2017, p.12). In contrast, Western philosophy was rooted in Confucianism and focused on the social role and harmony of the collective good (Berthel, 2017, p. 12).

Table 4

Timeline of Higher Education Development

Period in History	Label	Leader/Philosophy
2-4 million yrs-200,000 BCE	First Humans	n/a; first means of verbal
3000 BCE	Mesopotamia	Hammurabi empire with law code
3100 BCE	Egyptians	Only taught privileged
1100 BCE	Athens Greece	Pythagorean model all citizens
1000 BCE	Hebrews	Saul, David, Solomon
Approx. 720 BCE	The Persian Empire	Achaemenes
551-479 BCE	China	Confucius
470-399 BCE	Athens Greece	Socrates
384-322 BCE	Greece	Aristotle
354-430 AD	Rome	St. Augustine of Hippo
1225-1274 AD	Italy	St. Thomas Aquinas
1469-1527 AD	Italy	Machiavelli
1509-1564 AD	France	John Calvin
1588-1679 AD	England	Thomas Hobbes
1608-1674 AD	England	John Milton
1689-1755 AD	France	Montesquieu
1712-1778 AD	France	Jean-Jacques Rousseau
1724-1804 AD	Germany	Immanuel Kant
1737-1804 AD	USA	Thomas Paine
1805-1859 AD	France	Alexis de Tocqueville
1818-1883 AD	Germany	Karl Marx
1844-1900 AD	Germany	Fredrich Nietzsche
1859-1952 AD	USA	John Dewey
1893-1976 AD	China	Mao Zedong

Note. Spielvogel and Jackson (2013). Strauss and Cropsey (1987). The History of China. (n.d).

As time progressed from the ancient world into the periods of the Renaissance, Enlightenment, and the Modern World, each period provided the globe with specific philosophers, philosophies, and movements, which refined higher education and HEIs

accordingly. St. Augustine of Hippo's noteworthy works were *The Confessions* and *City of God*; which included essential themes such as politics, justice, law, and faith (Strauss & Cropsey, 1987). Karl Marx's most noteworthy piece was *The Communist Manifesto*, which provided the framework for a transition and development of the communist doctrine (Strauss & Cropsey, 1987). Finally, Mao Zedong created the People's Republic of China and China's Communist Party (Strauss & Cropsey, 1987). As evidenced from the historical record, government's role in higher education and HEIs progressed and developed with the ebbs-and-flows of time, region, politics, and endogenous and exogenous shocks that were presented at the time.

Global Perspective of HEIs and Value

Higher education institutions did not have an agreed-upon international value standard to reference when comparing the United States and China. Research by Amir, Auzair, Maelah, and Ahmad (2016) addressed value and HEIs through the conceptual paper using the value-based pricing approach, which further used "value-added" to measure student's "individual utility" (p. 935). The overall purpose of the value factor was to find a monetary worth in the data, which can be done through a customer value map. Although Amir et al. covered value factors, there was a missed connection for HEIs and an international value standard that could provide evidence of gaps in the literature and a foundational purpose of the research.

Daromes (2015) examined the value and HEIs from the belief system theory perspective, where organizations created a formalized institutional way of life for internal operations. In other words, for the institutional system, internal operations elements such

as standards, procedures, and plans were considered (Daromes, 2015, p. 663). Although the notion of value was touched on for HEIs by Daromes, there was not an agreed-upon international value standard. Barron (2017) analyzed HEIs and value based on the 2006 Berlin Principles that were created to standardize the practice of institutional rankings. Barron (2017) proved that value was meaningful by collecting data in a non-bias way; however, the principal did not provide standardization on how to collect the data.

Susilo (2016) highlighted HEIs and value using a customer-value form, place, time, and an ownership construct that explained consumer value is being akin to the utility of goods with a price (p.186). Susilo's "customer value" was a partial foundational framework to the international value standard using quantitative measures. However, the "customer value" did not provide the same variables used by this research. Lee and Raschke (2018) discussed HEIs and value through the lens of educational value where there were antecedent conditions such as procedural justice, distributive justice, research engagement, teaching engagement, and service engagement; while the outcome conditions were perceived educational value, affordability, appropriate class sizes, and appropriate entrance standards (p. 445). The notion of educational value provided a possible foundation for the global value index; however, the Lee and Raschke literature did not touch on the topic.

Lai, To, Lung, and Lai (2012) discussed HEI and value based on the context of perceived value using the categories of functional value, social value, emotional value, epistemic value, and conditional value. There was room for perceived value and HEIs within the notion of a global value index; however, Lai et al. (2012) did not discuss the

gap. Hamid, Mustafa, Suradi, Idris, and Abdullah (2012) used the value-based performance excellence framework for HEIs in Malaysia to measure performance through values constructing leadership, culture, productivity, to measure core values such as truthfulness, trustworthiness, citizenship (p. 3,026). The value-based performance excellence framework provided some information on connecting stakeholders and indicators for HEIs; however, there is not an international value index provided.

Golooba and Ahlan (2013) described the concept of value co-creation as products and/or services that are produced and used for the consumer, customer, and/or stakeholder. The authors merged two theories; the service-dominant logic theory (SDL) and the work systems theory (GDL), which created their proposed framework. The proposed framework contained the following: (a) business process management and information management with input, process, and output information; (b) information technology architecture, and governance with service-oriented architecture (SOA); and (c) the value co-creation component which provided the interaction between the service provider and customer with B2B and/or B2C. The merged concept of value co-creation was important for HEIs as it was a foundation on how to measure processes and information; however, there was not a true international standardization for it. Milla, Martin, and Van Bellegem (2016) examined the concept of value-added (VA) based on HEIs. Colombia provided the "Saber 11" and "Saber PRO VA" indicators, which were exams provided to students prior to the entrance to HEI and exit from HEI. The authors built on the VA indicators creating a multidimensional value-added model (MVAM) that contained outcome specific value-added and composite value-added factors. The

difference with the MVAM was that it provided a holistic representation for HEIs to make better data-driven decisions (Milla, Martin & Van Bellegem, 2016, p. 372). The MVAM was an important indicator as it measured an entire country; however, it failed to forecast past Colombia and not scale up into Latin America, Western Hemisphere, and/or the Globe.

The global perspective of HEIs, as it related to value, indicated that an international value standard did not exist. In the current environment of HEIs, there was deregulation for the value of HEIs. Due to the deregulation for value of HEIs, the body of literature for global perspectives of HEIs, as it related to value, presented elements of an international value standard, however; it did not present the entire idea of it.

United States HEI History

During the 17th Century, Christian theology and ideology were strategically taught through HEIs such as Harvard University (founded in 1636) and Yale University (founded in 1701). Clergy, doctors, lawyers, and politicians received the doctrine as they were future leaders of the American colonies (Ford, n.d, p. 562). Historical Context of Institutional Diversity (2013) explained that the founding fathers debated the notion of a "National University" at the Constitutional Convention in Philadelphia. Men such as Benjamin Rush, James Madison, and George Washington were all proponents of a National University; purposed to mold men for the Republic, and to create institutional research to benefit the state and society (Historical Context of Institutional Diversity, 2013). Ultimately, the idea failed; thus, public universities formed throughout the states. The first established *public* university in the country was the University of North

Carolina, founded in 1789. The New England region formed "colleges," which were private entities and driven with religious ideology (Historical Context of Institutional Diversity, 2013). During the 1800s, the United States passed several policies that addressed higher education. For example, in 1862, the Enactment of the Morrill Act established federal and state funding for college through the sale of public lands (Taylor, 2016, p. 22). The Hatch Act established agricultural experiment stations for scientific research in 1887 and the passage of the Second Morrill Act in 1890 advanced education in the former Confederate states and new territories requiring them to admit students regardless of race or establish separate land grant schools for persons of color (Taylor, 2016, p. 22).

Evidence showed that the cost and price of United States colleges before World War I was affected due to public and private universities not having solid strategic and financial plans in place, which created an environment of low retention and graduation rates (Thelin, 2015). Zumeta (2011) posited for HEIs comparisons to happen states must analyze policies explaining the effect of higher education in terms of student aid policies, public sector tuition policy, state mandates, and regulations on private higher education (pp. 430-432).

Rose (2018) highlighted three specific higher education policies that played critical roles in the United States during the 20th century: (a) the Serviceman's Readjustment Act also known as the GI Bill of 1944, (b) the National Defense Education Act (NDEA) of 1958 and, (c) the Higher Education Act (HEA) of 1965. Rose's (2018) assessment, based on the NDEA and HEA, was that women obtained support for higher

education due to "inadvertent outcomes," while the GI Bill continued to support the gender gap (p. 5). This was due to the servicemen from World War II who were majority male (Rose, 2018, p. 5). Hutcheson (2011) analyzed the first federal commission report on higher education titled "Higher Education for American Democracy." The report was established in 1946 by United States President Harry S. Truman; was six-volumes and argued for equal opportunity and an educated citizenry (History of Learning Assistance in United States Postsecondary Education, 2010). In 1965, the Higher Education Act provided \$70 million towards scholarships for the first year, full-time students that needed support (Hutcheson, 2011, p. 51). Hegji (2017) provided a policy brief on the Higher Education Act (HEA). The brief distilled the HEA in two manners: (a) it was organized into eight sections; and (b) there were eight revisions of the HEA from 1968 through 2008. The HEA is still essential today, for colleges and universities in terms of appropriation and budgetary matters, e.g., teacher education grants, endowment challenge grants, and promotion of entry into STEM fields (Hegji, 2017, p. 32-34). In April of 2019, The Bill and Melinda Gates Foundation along with the Institute for Higher Education Policy decided to fund and manage a newly formed "Postsecondary Value Commission" with the mission of defining a postsecondary value with a deadline of mid-2020, providing a measurement framework and recommendations (Postsecondary Value, 2019).

The organization and structure of HEIs in the United States contain universities, colleges, and academic departments, while disciplines structure the academic units. For example, the college of humanities, college of science, college of engineering, and the

like have leadership and management chains of their own. However, the leadership and management chains differ depending on whether the university or college is private or public.

The United States HEI history in the context of this research matters because there was no mention of an international value standard. The only mention of a standard was the Gates Foundation attempting to create a "value standard" for the United States. The United States HEI history in the context of how it functioned mattered for the research because there was no mention of an international value standard within the general operation of United States HEIs.

China HEI History

Fan, Wen, Yang, and He (2017) described that China had one of the oldest higher education systems globally, with records going back to the first Five Emperors from 2852-2205 BCE (p. 733). Liu (2012) partitioned the Chinese HEIs into four periods: Prehistoric before 2100 BC; Ancient 2100 BC-221 BC; Imperial 221 BC-1911 AD; and Modern 1911 AD-Present (p. 113).

HEIs in China were, and are, based on Confucian ideology and teach individuals they must be present to their true virtue (Fan et al., 2017, p. 737). Editors Introduction: Revisioning Higher Education (2017) explained that the history of HEIs in China displays a consistent clash of receptivity towards western ideology into their system. In 1919, there were protests against the Confucian tradition at Beijing University; in 1937 Mao Zedong founded Yanan University based on western academic ideology but containing 'moral discipline'; from 1966 through 1976 China had a Cultural Revolution

with almost no open universities across the country; and recently there is 'holistic liberal arts' known as 'suzhi' education (Editors Introduction: Revisioning Higher Education, 2017, p. 555).

The progression of the HEIs in China had taken two paths; one led to state-run schools that used imperial examinations, and the second known as the shuyuan schools, who worked on the development of an individual's personal qualities. The history of HEI admission in China began during the Imperial Period with the Imperial Examination, transitioned to the model of the worker, farmer, and soldier during Modern China (Liu, 2012, p. 107). Finally, during the 1960s and 1970s, China formed the concept of the National College Entrance Examination (NCEE) (Liu, 2012, p. 107). Passing the national exam is still a norm that high school students must do in China as part of the process of gaining admission into university or college. Feng (1999) provided three essential strengths and weaknesses for the NCEEs. The strengths of the NCEE were trust in the system of government, efficiency by the government, and a means in which HEIs standards can benchmark (Feng, 1999, p. 48-49). The weaknesses were an education resource waste, the admission process was biased in part due to the NCEE exam, and individuals were set aside based on political and social classes (Feng, 1999, p. 49-50).

Xuewei (1993) explained that China's admission policies were conducted in regions and at the local level, yet guided by the State Education Commission (p. 6). China has undergone three ebbs-and-flows by the State Education Commission known as a unified plan for student recruitment and admissions during the periods of 1952 to 1965, 1966 to 1976, and 1977 to 1982 (Xuewei, 1993, p. 7). Reforms in the student admission

system aligned with economic and educational reforms, e.g., China transitioning to a dual system of planning (Xuewei, 1993, p. 9). Currently, China provides two national exams known as the 'huikao' for middle school graduates and the 'gaokao' for prospective individuals that desire college attendance. The Ministry of Education of the People's Republic of China contains "The Higher Education Law of the People's Republic of China." This law was effective on January 1, 1999, written with a contents section and eight chapters. The first chapter 'general provisions' contained 14 articles explaining concepts such as higher education is anything after senior middle school, it should be based on Marxism-Leninism, Mao Zedong Thought, and Deng Xiaoping Theory (Higher Education Law of the People's Republic of China, n.d). The Ministry of Education of the People's Republic of China contained an additional law entitled Regulations on Academic Degrees of the People's Republic of China. This law was effective on February 12, 1980, and amended on August 28, 2004, containing 20 articles. A broad concept of the law was that China required its citizens to be members of the communist party and to have good grades in order to qualify for Bachelors, Masters, or Doctorate programs (Regulations on Academic Degrees of the People's Republic of China, n.d).

The organization and structure of the HEIs in China were similar to the United States as it also consisted academic units and functional organizations. The functional organizations contained universities, colleges, and departments, while disciplines structured the academic units, all of which were similar to the United States. However, the diverging path was the leadership system. The People's Republic of China (PRC) was founded in 1949, where the president took overall responsibility from 1950-1956 (Gu, Li,

and Wang, 2018, p. 60). The PRC undertook seven cycles where the current cycle consists of the president maintaining responsibility under the leadership of the Chinese Communist Party's primary committee, which began in 1989 (Gu, Li, and Wang, 2018 p. 61).

Upon review of China's HEI history, there was no mention of an international value standard. Likewise, China HEIs history in the context of how it functioned also did not reveal an international value standard. This was relevant because it showed the gap in the literature of the international HEI value standard absence.

Secondary Effects of HEIs

The initial "secondary effect" of HEIs were based upon economics. The term "Glonacal" was coined meaning global + national + local = Glonacal (Marginson, Kaur, & Sawir, 2011). "Glonacal" is understood as a symbiotic relationship where a task on the global side of HEIs affected a task on the national side of HEIs, and so on. More specifically, when university X has received recognition in a global capacity (receiving global rankings, engaging in international research, having a certain amount of international students) the national component (government) and local component (investors) are affected through university creditability and/or performance (Marginson, Kaur, & Sawir, 2011, p. 14).

The second "secondary effect" of HEIs were concerning national security. Dumitru and Feararu (2018) argued that the National Security tenants formed around economic, political, military, social, and environmental sectors. The political and social sectors maintained the ideological, institutional, and physical stability of the state

(Dumitru & Feararu, 2018, p. 94). Therefore, the HEIs would be categorized under the political sector as they are an institution. Dumitru and Feararu (2018) asserted that security was measured when the state/organization/system operated without insecurity for a certain amount of time concerning history (p. 96). Bolborici (2016) provided a historical context of national security with definitions of the Cold War, such as Buzan's analysis of security affecting human communities in five manners. The five manners included military, political, economic, societal, and environment. The United Nation's definition asserted that security must take on a collective and collaborative security approach in the context of international security to restore peace and security in the global community (Bolborici, 2016, p. 161).

History of HEI Accreditation

The following section was based on the History of HEI Accreditation. The History of HEI Accreditation was based on three sections. The first section is Global HEI Accreditation. The second section is U.S HEI Accreditation. Finally, the third section is China HEI Accreditation.

Global HEI Accreditation

From a global perspective, the history of HEIs and accreditation was still a new concept. Therefore, the contemporary notion of HEIs needing accreditation for validation of legitimacy pointed to the gap in the academic literature that there was not an agreed-upon *international value standard* to refer to when comparing the United States of America and China, or any other HEI located throughout the world. Globally, "The United Nations' Conference on Sustainable Development Rio +20" developed the Higher

Education Sustainability Initiative (HESI). Likewise, the United Nations created the Sustainable Development Goals (SDG) for our Global Community. The SDG Number Four of 2016 underscored the equitable quality of education and lifelong learning, including the importance of higher education, quality assurances, regulations, and policies (Education 2030: Incheon Declaration, 2016). Therefore, the United Nations recognizes the need for HEIs and accreditation holistically; but does not have a global formula, and/or evaluation for HEIs to become accredited and does not have periodic check-ins on the HEIs accreditation status. Likewise, the European Union has supported, along with the "Erasmus+Programme," "The European Association for Quality Assurance in Higher Education" (ENQA). The establishment of the association began in 1994-1995. The association developed overtime making various recommendations, including the Bologna Declaration. The European Minister of Education created the Bologna Declaration (The European Association for Quality Assurance in Higher Education, n.d). The Bologna Declaration was the first standard set in higher education for the EU members that were part of the association (The European Association for Quality Assurance in Higher Education, n.d).

The ENQA contained accreditation guidelines for quality assurance that the European Union countries' Higher Education Institutions should follow. Again, there was no compulsory standard formula and/or evaluation that the ENQA has created for HEIs (The European Association for Quality Assurance in Higher Education, n.d).

The section of Global HEI Accreditation in the context of an international value standard emergence was nonexistent. This proved to be noteworthy because it solidified

the gap in the literature. The non-presence of an international value standard in the section of Global HEI Accreditation provided more evidence for purposes of this research, as a credible foundation to create a standard.

United States HEI Accreditation

Bell (2017) explained that the history of United States accreditation began at the end of the Gilded Age (1877-1900) and through the Progressive Period 1897-1920 where the first oversight and authority organizations were The National Association of State Universities (1895), the Association of American Universities (1900), the General Education Board (1902), and the Carnegie Foundation for the Advancement of Teaching (1905) (pp. 68-69). Paton, Fitzgerald, Green, Raymond, and Borchardt (2014) defined accreditation as a means of self-regulation and peer review adopted by the educational community where the process was intended to strengthen and sustain the quality and integrity of higher education providing public confidence and minimizing external control (p. 46).

The United States Department of Education provided authority and powers to six regional accreditors: (a) Middle States Commission on Higher Education (MSCHE); (b) New England Association of Schools and Colleges Commission on Institutions of Higher Education (NEASC-CIHE); (c) North Central Association Higher Learning Commission (NCA HLC); (d) Northwest Commission on Colleges and Universities (NWCCU); (e) Southern Association of Colleges and Schools Commission on Colleges (SACSCOC); (f) Western Association of Schools and Colleges College and University Commission (WASC).

Table 5

United States Regional Accrediting Association

Regional Accrediting Association	Region
Middle States Commission on Higher Education MSCHE	Delaware, DC, Maryland, New Jersey, New York, Pennsylvania, Puerto Rico, Virgin Islands, and “other geographic areas in which The Commission conducts accrediting activities” (MSCHE, n.d.).
New England Association of Schools and Colleges Commission on Institutions of Higher Education (NEASC-CIHE)	Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island Vermont, and “institutions in several other countries accredited by CIHE” (NEASC-CIHE, 2013).
North Central Association Higher Learning Commission (NCA HLC)	Arizona, Arkansas, Colorado, Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, New Mexico, North Dakota, Ohio, Oklahoma, South Dakota, West Virginia, Wisconsin Wyoming (NCA HLC, 2012).
Northwest Commission on Colleges and Universities (NWCCU)	Alaska, Idaho, Montana, Nevada, Oregon, Utah, and Washington (NWCCU, n.d).
Southern Association of Colleges and Schools Commission on Colleges (SACS COC)	Alabama, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Texas, Virginia, “Latin America and other international sites” (SACS COC, 2013 para. 1).
Western Association of Schools and Colleges College and University Commission (WASC)	California, Hawaii, Guam, American Samoa, the Federated States of Micronesia, the Republic of Palau, and the Commonwealth of the Northern Mariana Islands (WASC, 2013).

Reprinted from “US Higher Education Regional Accreditation Commission Standards and the Centrality of Engagement,” by Patton, V. O., Fitzgerald, H. E., Green, B. L., Raymond, M., and Borchardt, M. P., 2014. *Journal of Higher Education Outreach and Engagement*, 18(3). Reprinted with permission.

Lindgrensavage (2016) explained that HEI accreditation in the United States had four roles: quality assurance, controlling access to state and federal funds, the confidence of HEIs for employers, and transfer of credits (Lindgrensavage, 2016, p. 336). In the United States, the federal and state government use a laissez-faire approach for oversight with Accreditors and HEIs, whereas other countries use their Ministries of Education to oversee the accreditation of HEIs (Lindgrensavage, 2016, p. 332).

Eaton (2015) explained that states would allow HEIs to operate without accreditation on the onset, however, in order for the HEIs to maintain operating status, it must obtain accreditation in order to receive state funding (p. 3-4). Access to funds were only available based on the HEI accreditation. Funds were obtainable at the federal level

with student financial aid, and the state level released it dependent on accreditation (p. 3).

Eaton (2015) described four types of accrediting organizations in the United States:

regional, national faith-related, national career-related, and programmatic (p. 4).

Table 6

United States Accreditation Process

Type of U.S. Accrediting Organization	Roles of Accreditation	Operation of U.S. Accreditation	Council for Higher Education Accreditation CHEA	United States Department Education USDE
Regional accreditors	Assuring quality	Self-study	Advance academic quality	Student achievement
National faith-related accreditors	Access to federal funds and state funds	Peer review	Demonstrate accountability	Curricula
National career related accreditors	Engendering private sector confidence	Site visit	Encourage, where appropriate, self-scrutiny and planning for change and needed improvement	Faculty
Programmatic accreditors	Easing transfer	Judgement by accrediting organization Periodic external review	Employ appropriate and fair procedures in decision making Demonstrate ongoing review of accreditation practice Possess sufficient resources	Facilities Fiscal and administrative capacity Student support services Recruiting and admission practices Measures of program length and objectives of degrees or credentials offered Record of student complaints and record of compliance with program responsibilities for student aid as required by 1965 federal Higher Education ACT (Title IV)

Note: Eaton (2015).

Ramirez (n.d) explained that there were two types of accreditation: program and institutional, where institutional accreditation covered the entire HEI program. Ramirez (n.d) also proposed the concept of discourse: a reality that assigns meaning. The

connection of discourse to HEIs and accreditation was the accreditation process and quality assurance, for example, text (Ramirez, n.d., p. 945). Ryan (2016) explained that a common theme of accreditation for HEIs was quality assurance and standards of how accreditation authorities operated, whereby some were voted on by boards, and some adhered to private agreements (p. 2).

In 2016, the National Defense University created The United States Accreditation Model to analyze United States funding, policy, appointments, and functional linkages referenced below:

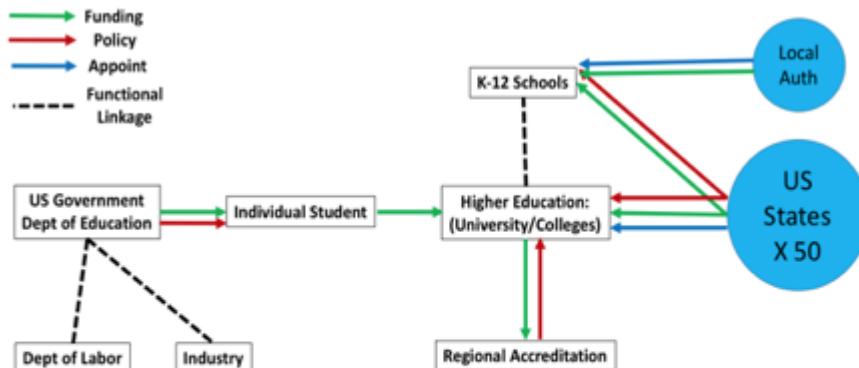


Figure 1. United States Accreditation System

Note: Data for flow chart of US Accreditation System reprinted from The Dwight D. Eisenhower School for National Security and Resource Strategy (2016).

The United States Department of Education recently published nine proposals to reform the Higher Education accreditation system; some which included: (a) increase academic and career mobility for students by eliminating artificial boundaries between

institutions due to the credential levels an institution offers or the agency that accredits the institution or its program; (b) reward institutional value-added, not student selectivity; and (c) streamline and clarify the Departments accreditor recognition process (Rethinking higher education accreditation reform, 2018). The University of California, Los Angeles, created The Higher Education Research Institute (HERI) who now is using Cooperative Institutional Research Program (CIRP) Surveys in accreditation and "is now developing guides which align CIRP survey results with all six regional accrediting agencies" (Using CIRP Surveys in Accreditation, n.d, para. 15).

The process of United States HEI Accreditation as it related to online universities was not different from brick and mortar universities. For example, Walden University's institutional accreditation came from the Higher Learning Commission (HLC). Southern New Hampshire University institutional accreditations came from the New England Commission of Higher Education. Finally, Western Governors University accreditations came from the Northwest Commission on Colleges and Universities.

The literature concerning United States HEI accreditation in the context of providing an international value standard was nonexistent. Within the United States, there are various accreditation models that HEIs may use. Therefore, the academic body of literature proves that the United States HEIs did not engage in an HEI standardized national value system or HEI international standard value system.

China HEI Accreditation

Guangli (2016) explained that China's accreditation system was established in 1986 by the State Education Commission with the Chinese Communist Party and leader

Deng Xiaoping. Prior to Xiaoping's reign, Mao Zedong ruled up until 1976, using Maoism, which was the political philosophy of Communism. Due to the massification of accreditation, the government transitioned to a blended form of government and private operation. The Higher Education Law of 1998 established in its Article 44 that HEIs must provide access for supervision and evaluations by education administrators within their departments (Guangli, 2016, p. 44). The referenced law of 1998 underscores how HEIs in China follow communist government policy.

In Hong Kong, universities were providing accreditation through self-accreditation, which affected the distance education learning community. In 2007, there was a new policy passed for institutional audits titled 'Accreditation of Academic and Vocational Qualifications Ordinance' (Jung et al., 2011, p. 66). Dill (2015) asserted that the Hong Kong Academic Audit process must clarify their necessary tasks for HEIs.

Shenzhen University, which is part of the Guangdong Province in China, received its accreditation from the State Council of the People's Republic of China (School Profile Shenzhen University-SAR University, Window University, Experimental University, 2019). In the middle 1990s, Shenzhen University gained approval to give graduate degrees by the Degree Committee of the State Council due to meeting the standards of the evaluations, and in the 2000s it received authority to provide terminal degrees (School Profile Shenzhen University-SAR University, Window University, Experimental University, 2019).

Jung, Wong, Li, Baigaltugs, & Belawati (2011) explained that a part of the accreditation process of China is their distance education options. In 2003, the Ministry

of Education required that HEIs comply with a type of quality assurance and accreditation that it had implemented through the Distance and Continuing Education Office (Jung et al., 2011, p. 65). The milestone was vital because it validated the distance education for China and created a foundation for allowing China to have HEIs compete on the global stage.

Figure 2 provided a "Structure of Evaluation System" in China and contained the organizational structure of China's government. The Chinese government was based on China's Communist Party (CCP) beginning with the Ministry of Education at the top and ending with the Municipal or Provincial Education Commission. The section of China HEI Accreditation, in the context of providing an international value standard, was nonexistent. Within China, there were different paths for accreditation that HEIs may use. Therefore, the academic body of literature proved that the Chinese HEIs did engage in an HEI standardized national value system or HEI international standard value system.

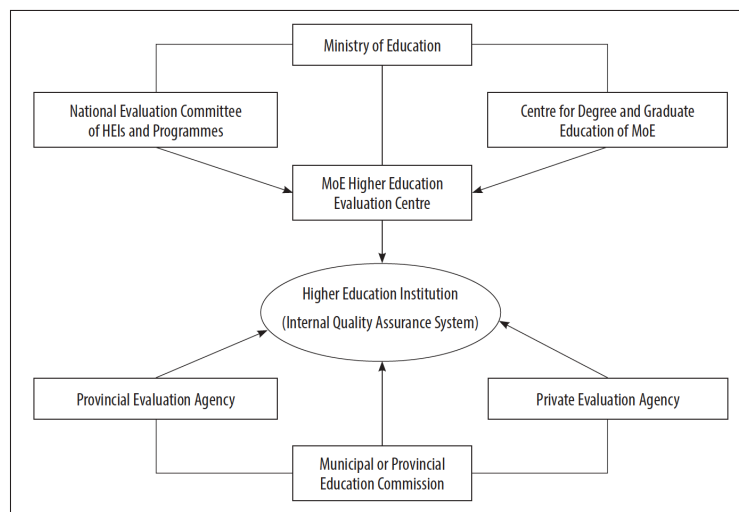


Figure 2. Structure of Evaluation System in China

Reprinted from "Governance Reforms in Higher Education: A Study of China," by Li, M. and Yang, R., 2014, *IIEP-UNESCO*. Reprinted with permission.

Comparative Analysis of United States versus China HEIs in the Literature

The following section is based on a comparative analysis of United States versus China HEIs as discussed in the literature. The first section is the Global Comparison. The second section discusses the perceived "best practices." The final section discusses the "less than best practices" discovered in the comparative review.

Global Comparison

The topics in the body of literature for "Higher Education Institutions," "comparative," and "international" were diverse. Yeravdekar and Tiwarim (2014) explained the difference between globalization and internationalization. The term internationalization provided room for two nation-states to engage with multinational, cultural, and linguistic elements, whereas globalization increased productivity for the state, thereby increasing competition for HEIs (Yeravdekar & Tiwari, 2014, 204-5). Dostal, Chalupova, Cerna, and Prokop (2018) reviewed HEIs from a global comparison within a national security lens encompassing four select countries: Czech Republic, Finland, Brussels, and France. The authors reviewed two questions: (1) "what were international student's barriers;" and (2) "what were the impact of terrorist attacks on international students related to HEIs" (p. 93). Their findings suggest that terrorist attacks were significant to international HEI student mobility based in Paris, France, and Brussels samples (Dostal et al., 2018, p. 99). Shams and Huisman (2016) analyzed HEIs through an International Branch Campus (IBC's). IBC's were defined as having one

home campus and one branch campus located in another country with the authority to grant at least one academic degree. Shams and Huisman (2016) explained that there were two concepts of IBCs within the body of literature. Singapore and Malaysia were used as IBCs due to their clear language in policies, regulations, and longevity with foreign HEIs; while Australia and Britain were chosen as the home campus (Shams & Huisman, 2016, p. 959). Pavel (2015) reviewed HEIs from the world rankings perspective, indicating that there were four markers that a university must have: teaching, research, knowledge transfer, and global outlook. Pavel (2015) also recognized three major organizations that researched and ranked HEIs: (a) Academic Ranking of World Universities (ARWU); (b) QS World University Rankings (QS); and, (c) Times Higher Education World University Rankings (THE).

It can be seen that the theme for global comparison and HEIs within the academic body of literature were inconsistent at best, and nonexistent at worst. One inconsistency of the theme for global comparison and HEI was "what" was used for comparison: HEI rankings, IBC, and national security issues. Another inconsistency of the theme for global comparison and HEIs was the selected countries being compared. The inconsistencies, and lack of substance provide more sound evidence for the need of an HEI international value standard.

Best Practices

Chen and Yeager (2011) provided a comparative context for HEIs through the lens of teaching evaluations in the United States and China. The main components and differences were that China's standards, practices, and policies were derived from the

Ministry of Education, whereas the United States practices for teaching evaluations do not follow a national government standard and base their standards, practices, and policies on research and evidence at the state and local level (Chen & Yeager, 2011, p. 222). Li (2012) analyzed professors' attributes and students' perceptions as authority figures in the United States and China (p. 116). The context provided several comparative studies, such as attitudes toward institutional authority in various countries and authority elements within the classroom (Li, 2012, p. 118). Zhou, Tijssen, and Leydesdorff (2016) assessed the relationship between University and Industry Collaboration (UIC) through publications of the United States and China, looking at specific indicators such as income/expenditure and output/input (p. 2). Discussions and conclusions indicated that although a university may have high academic standards and publications, this did not equate to the most engaged UIC (p. 15).

Zha (2011) focused on comparing the massification of higher education using China, the United States, Western Europe, and Latin America. The United States was the first country to undergo the process of massification, which included diversity in funds from the public and private sectors. China, on the other hand, believed in "state instrumentalism" where the HEIs were "quasi-markets" meaning the State had control while the student was preparing for work (Zha, 2011, p. 763). Funds mostly came from the family as China was based on the Confucian System Ideology (Zha, 2011, p. 763). Liu and Dai (2012) highlighted the internationalization of HEIs from the perspective of the university as an organization and students as the product. The authors explained that internationalization could only occur if the instructors were internationalized, who then

could internationalize the curriculum. A snowball effect would result with the internationalization of university management and the internationalization of institutions abroad (Liu & Dai, 2012, p. 60-63).

Custer (2018) explained there are five methods that HEIs may choose from for international comparison: single-country studies, juxtapositions, thematic comparisons, identifying causal regularities, and grand theories (p. 240). Custer (2018) used a thematic comparison (refer to Appendix D: HEI Standard HEI Comparison Questions), which used a standard set of questions for the international HEI comparison (p. 240).

It can be seen that the theme for HEIs' 'Best Practices' within the academic body of literature contained relevant consistencies. One consistency of the theme for Best Practices and HEIs was "what" came up for comparison, items such as teaching evaluations and University and Industry Collaboration (UIC). Another consistency of the theme for Best Practices and HEI was the "countries" to compare (e.g., the United States and China). Although these consistencies were relevant for the research, they did not provide the entire framework for an HEI international value standard that targets a meaningful "what to compare" education systems in terms of valuation.

Less than Best Practices

Bernhard (2012) focused on an international higher education country comparative analysis addressing quality assurance. The countries included were: Austria, Germany, Finland, United Kingdom, United States, and Canada. Bernhard (2012) used a four-part approach, including a comparative analysis at four layers: international, descriptive, discursive, and analytical (p. 158). The comparative analysis used

international and national level data and different HEIs theoretical frameworks: massification, diversification, privatization, and internationalization (Bernhard, 2012, p. 164). Moodie (2015) discussed HEIs and the United States from a comparative perspective using the countries of the United States, the U.K., and Australia. "Diversity," derived from the natural sciences (biology) where the focus was on choices in varieties, was an important attribute to this research. The question of diversity, and how to measure it was answered by two means: through grouping HEIs by their statistical properties and by choosing essential elements of the HEIs (Moodie, 2015, pp. 4-6).

Chadha and Toner (2017) focused on the idea of HEIs in the United States from a comparative perspective using the United States and the U.K. The authors identified that within the body of literature there are discrepancies for the term "employability," where one approach contends that the skills should have a net positive for an individual, the employer, and society (Chadha & Toner, 2017, p. 2). Another approach underscored students identify a degree with employability, whereas employers do not. Some employers preferred hard and soft skills that students can use within the company and are not necessarily delivered an academic degree (Chadha & Toner, 2017, p. 2). Renner and Roach (2011) examined and compared International and United States student experiences when they studied abroad. The purpose was to gain a better understanding for all parties, including students, HEIs, stakeholders, and so the parties in the future could make better decisions for the study abroad programs (Renner & Roach, 2011, p. 2). Sabbagh (2011) provided an international comparison of affirmative action with HEIs using the United States and France. The author's research showed that in the United

States, affirmative action programs were more open and direct for HEIs, whereas in France, they were not (Sabbagh, 2011, p. 497). Ultimately in the United States, desegregation and territorial disputes were resolved in the 1970s; whereas France is still attempting to manage and deal with students using territory location and class for employment and education (Sabbagh, 2011, pp. 497-498). This was important for the HEI comparative relationship as it provided the underlying content of affirmative action policies and programs.

Ha (2018) compared Italy and China HEIs; choosing those countries due to their rich academic histories. With the recognition of history, the comparison was based on: academic autonomy from political power; and implementation of a knowledge transfer from university to society. Ha (2018) also analyzed specific personnel reforms of HEIs and their success for "competition of knowledge production" (p. 88). An example of personnel reforms in China was with China's Guangzhou University, which was carried through the Regional Comprehensive University. An example of personnel reform in Italy was through Italy's Law No. 240, which ruled on the organization of public universities and the recruitment of their personnel.

Huang (2006) used a comparative analysis with the countries of China, Japan, and The Netherlands, and explained that the internationalization of HEIs curriculum happened when the English language was implemented. Huang (2006) explained that internationalization could also come when the course would have international subjects and/or contents. Oleksiyenko (2014) examined the comparative relationship of HEI output between China and Russia, and other countries competing for an HEI global

positioning. This relationship was examined through research, scientist performance, and funding data (Oleksiyenko, 2014, p. 486). Results indicated that China had a better position on the Global community than Russia, where the ranking of institutions by the SCOPUS Index (the largest abstract and citation database of peer-reviewed literature through ELSEVIER) put the Chinese Academy of Sciences above the Russian Academy of Sciences (Oleksiyenko, 2014, p. 498).

Hu, Liu, Chen, and Qin (2017) assessed strategic planning for HEIs to compare differences of the HEIs. For China, there are three different strategic plans: the five-year plan, the medium- and long-term plan, and the specialized plan. Results varied in reference to the strategic plans. For example, the specialized plans showed that the mission statements varied. Han and Zhong (2015) wrote about HEIs through the comparative perspective of strategy maps. Strategy maps promoted good governance; they helped address changes in society and helped to quantify assets (Han & Zhong, 2015, pp. 940-941). The process for strategy mapping was first used to identify expressions of vision and mission; and next compared the universities' vision and mission statements (Han & Zhong, 2015, pp. 945-946). Jiang and Li (2012) compared data of HEI party secretaries and HEI party presidents. China required both public and private institutions, party secretaries, to influence the administration and development of the appointed HEI (Jiang & Li, 2012, p. 2). Findings reported that party secretaries had more females and fewer degree holders from overseas, while the data from party presidents had more males and degree holders from overseas (Jiang & Li, 2012, p. 11).

Xuewei (1993) posited that student admission exams in China were essential and have undergone transitions; from 1952 to 1965, 1966 to 1976, and finally 1977 to 1982 (p. 7). Higher education recruitment and admissions policies were conducted at the regional and local level, yet were guided by the State Education Commission during The Five-Year Plan (Xuewei, 1993, p. 6). The transformation of the economic system (production to commodity) and educational systems led to admission transformation, e.g., China changing to a dual system of planning where there was command planning system (Xuewei, 1993, p. 9). Xuewei (1993) explained that the 'huikao' was the national exam for middle school students, while the 'gaokao' was the national exam for high school students, resulting in whether students' could gain access to college and university (p.17).

It can be seen that the theme for 'Less than Best Practices' and HEIs, within the academic body of literature, contained inconsistencies. One inconsistency for the theme 'Less than Best Practices' and HEI was "what" came up for comparison (e.g., quality assurance, diversity, degree, and employability). Although these consistencies were relevant for the research, they did not provide the entire framework for an HEI international value standard.

Research Questions in the Literature

The following section was based on the Research Questions proposed for this research. The first section was based on the first research question, "to what extent if any is there a difference in value between undergraduate degrees for accredited public 4-year universities in China and the U.S between 2009–2019? The second section was based on the second research question, "do relationships exist between or among the variables

alumni, award, HiCi, N&S, PUB, and value from public 4-year universities in China and the United States between 2009–2019?" The final section was based on the state-of-the-art Measures of Effectiveness (MOEs) concerning HEI.

Value Differences Between Undergraduate Degrees for Accredited Public 4-Year Universities: China and the United States

In terms of value, Chapman and Lindner (2016) discussed different definitions of corruption for higher education. Corruption was of substance to the theme for value as it provided the devaluation of HEI degrees. The authors ultimately used abuse of power for self-interest as their definition of corruption. Corruption could occur in higher education in four manners: (a) funding could be slashed whereby professors resort to selling grades and ghostwriting papers; (b) embezzlement; (c) asset misappropriation; and (d) skimming (Chapman & Lindner, 2016).

Hongjuan (2018) asserted there were similar themes within the body of literature, such as improving student learning when comparing reforms of the United States' higher education policy and China's higher education policy (p. 282). Higher education institutions in the United States have transitioned to learning institutions for students from the traditional four-year brick-and-mortar model of students attending lectures and then studying for set examinations. Likewise, the United States 21st Century policy cultivated Common Core attributes through four areas: (a) recognition of culture and the natural world; (b) teamwork and problem-solving; (c) responsibility; and (d) diversity (Hongjuan, 2018, p. 284). In other words, recognition of culture and the natural world for HEIs entailed learning, being open-minded, and accepting other's cultures. Teamwork

and problem solving entailed acknowledging the need for those skills within the HEI microcosm. Responsibility acknowledged the need for the skill within the HEI microcosm and finally, diversity at its core element focused on choices and varieties.

Bartlett, Han, and Bartlett (2018) clarified that as of 2014, China sent the most international students to the United States to study in HEIs. Therefore, the purpose of Bartlett, Han, and Bartlett's (2018) study was to conceptualize why Chinese students obtained their degrees from the United States and to understand the value of those degrees (p. 624). By gathering 73 factor statements, cataloging them into 12 statement groups, ranking them from highest to lowest, and then creating three participant groups, Bartlett, Han and Bartlett (2018) found that each participant group had different motives for obtaining their degrees in the United States whereby one group had educational motives while another group had educational and career-related motives.

Guo and Shi (2016) utilized the Chinese College Student Survey and explored links between classroom assessments, students' perceptions of assessments, and assessment with student learning within China's HEIs. Using factor analysis, 12 variables were created with one of them, including a 'value outcome,' which consisted of understanding oneself, philosophy, planning, recognizing, and respect (Guo & Shi, 2016, p. 648). A significant finding of Guo and Shi (2016) included that essay and report writing on student learning was the largest and most significant classroom assessment (p. 659). Johnson, Gutter, Xu, Cho, and DeVaney (2016) studied the perceived value of education based on human capital and social capital through the lens of Generation X and Generation Y (p. 194). Johnson et al. (2016) created a social capital index and a human

capital index. The social capital index had three variables, for example, meet new people, and the human capital index contained five variables, for example, making more money (p. 198). Johnson et al. (2016) ran an Ordinary Least Squares (OLS) regression model and found that Generation X had a loan satisfaction rate of 3.5 out of 5.0 (five being most satisfactory) and Generation Y having a 2.98 loan satisfaction rate. Using the loan satisfaction rate, Johnson et al. (2016) was able to take the social capital index and human capital index and show that the Generation X index number was low (on a scale of one through eight) making it of less worth than human capital which was higher on the scale of one through eight (p. 200).

After extensive review, it can be seen that the literature did not answer the first proposed research question for this research: "To what extent if any is there a difference in value between undergraduate degrees for accredited public 4-year universities in China and the U.S between 2009–2019?" The research will further explore what are the differences in value of undergraduate degrees from public universities from China and the U.S? The research is needed because the academic literature provides inconsistencies on value whereby the research question will address with evidence-based data on the differences in value of undergraduate degrees from public universities from China and the United States.

Value Differences Between Undergraduate Degrees for Accredited Public 4-Year Universities in China and the United States on Cost and Utility

Ren, Zhu, and Warner (2015) created a "within-subject" methodology from 2008 through 2014 to look at the problems of employment and employability for students who

graduated in China. Analysis of the interaction of key stakeholders from 2008 to 2014 with a Likert Scale of one through seven (one as no interaction at all, seven as extremely high) found there was low interaction (Ren et al., 2015). These findings were noteworthy because it showed there was a gap from graduation as a Chinese student from HEIs and the transition into finding a position of employment and actually being employable.

Lin, Li, and Pan (2018) examined the employment efficiency and job-seeking efficiency of college student's decision-making units (DMUs) by sending out a total of 620 questionnaires throughout the local universities and colleges in the Zhejiang Province, China. Input DMU variables consisted of problem-solving skills, communication skills, and goal planning while output DMU variables consisted of the work environment of the company, comparison with other students, major, and job matching degrees (Lin et al., 2018, p. 1,177). Lin, et al. (2018) discussed Family Income and Employment and found that the higher the family income, the lower the employment efficiency, meaning family income had a negative impact on employment efficiency for regular students (p. 1,182). Lin, et al. (2018) also found the higher the family social relations variable, the higher the employment efficiency for regular students, meaning family social relations had a positive impact on employment efficiency (p. 1,182).

Pedulla (2016) examined employment history and gender differences in the field and through survey data. Survey respondents consisted of a sample size of 903, where 53.6% contained "some college degree," 52.9% were men, and 26% work in firms of 500 or more employees (Pedulla, 2016, p. 276). Results indicated that men who worked part-time faced more miss-matched work and longer-term unemployment; while women were

penalized for underutilization of their skills (Pedulla, 2016, p. 276). Drucker (2016) found in Appendix E earnings that the earnings model (EARNCH) worked where some of the variables were statistically significant, for example, Percentage 25+ with a high-school but not a bachelor's degree (HIGHSCH), while some were not, for example, Science and engineering share of pre-bachelor's degrees (PREBSCI).

After extensive review, it can be seen that the literature did not answer the first proposed research question for this study either (to what extent if any is there a difference in value between undergraduate degrees for accredited public 4-year universities in China and the United States between 2009-2019). This research explored the differences in value between undergraduate degrees for accredited public universities in China and the United States and determine if they have a significant effect on employment rates. The research was needed because the academic literature provided inconsistencies on value and employment whereby the research question addressed, with evidence-based data, the differences in value between undergraduate degrees for accredited public universities in China and the United States and if they had a significant effect on employment rates.

Witteveen and Attewell (2017) examined income-earning rates with undergraduates through the scope of socio-economic status (SES). The dependent variable was graduates with a bachelor's degree self-reported income from 2003 approximately ten years after graduation, while the independent variable was family income. Results indicated that individuals from lower-income families who obtained their Bachelor's earned less income than individuals who were from affluent families, even when graduating from the most selective universities. This fact brought two

theories to the surface: (a) the lower-income individuals were put in a position to have to take a lower-paying job immediately after graduation; and (b) discrimination hiring whereby the individuals in charge have conscious and unconscious bias choosing individuals for organizations that are from affluent families. Proxies for determining if a student was from affluence included factors such as better manners, better appearances, more internships better traveled, and like tendencies (Witteveen & Attewell, 2017, pp. 1,565-1,566).

Vuolo, Mortimer, and Staff (2016) looked at if degrees significantly affect variables such as earnings, hours worked, job security during recession periods (p. 234). Vuolo et al. (2016) evaluated earnings (see Appendix F, "Degrees and the Economy") by using a pair-wise comparison of men and women finding that males with a bachelor's degree have the most advantage for an earning potential while women with a bachelor's degree during the years of 2005-2011 earning potential were lower and less meaningful (p. 245).

Thompson (2019) examined bachelor degrees into various categories such as non-selective, less selective, and selective, in an attempt to find intergenerational associations of the occupational and monetary measures of socioeconomic status (p. 17). Appendix G "Family Income and Degrees" results indicated that intergenerational association in family income was 0.410 (Thompson, 2019, p. 24). The income-income association varied by tier with a Bachelor degree: (a) non-selective; (b) less selective; and (c) selective (Thompson, 2019, p. 24). For example, the individuals from less selective

schools contained less significant intergenerational association at the $p < 0.01$ than those at the selective level.

Xu (2018) examined the social origin of college education and job earnings between 5,000 Chinese students through the Beijing College Students Panel Survey (BCSPS) five-round panel survey. The independent variable was poverty on campus, while the dependent variables were self-esteem and self-efficacy. Using the growth curve modeling method, findings showed that non-poor students had a higher mean hourly wage versus poor students mean hourly wage (Xu, 2018, p. 67).

After extensive review, it can be seen that the literature did not answer the first proposed research question for this research (to what extent if any is there a difference in value between undergraduate degrees for accredited public 4-year universities in China and the U.S between 2009–2019?). The research explored the differences in value between undergraduate degrees for accredited public universities in China and the United States have a significant effect on earning rates. The research was needed because the academic literature provided inconsistencies on value and earning whereby the research question addressed with evidence-based research the differences in value between undergraduate degrees for accredited public universities in China and the United States and if they had a significant effect on earning rates.

Watson (2014) analyzed HEIs, the cost of degrees, and the consequences of them. In other words, in 2014, student loan debt in the United States was approximately \$1 trillion where, on average, the student loan debt for a new college graduate was about \$30,000. A major issue with student loan debt was approximately 50% of college

students dropped out of university prior to completing the degree. Watson (2014) also covered the theme of bankruptcy and student loan debt in the context that it was feasible for student loan debt to be partially and completely cleared under the bankruptcy law. However, the odds were extremely low. One reason why it is difficult for borrowers to declare bankruptcy was because Congress was not clear with the "undue hardship" clause. Raisanen and Birkeland (2015) recognized that funding for public universities came from three streams, which were state, tuition, and endowments. Raisanen and Birkeland (2015) research reviewed tuition setting choices of universities and student credit as it related to state appropriations. Findings included through a three stage least square methodology that public universities depend on appropriations from the state, and that universities who have students who borrow more receive fewer future appropriations when the borrowing does not come from tuition increase or state funding cuts. Overall, the market was treated as a "private market" rather than a "public good."

China, on the other hand, asserted that HEIs and cost in China went from a free HEI system to a "cost-sharing system" (Wang, 2013). The cost-sharing system included three components: a state-planned scheme, a contracted scheme, and a fee-paying scheme. As the cost-sharing system was implemented in China, the HEIs were impacted. An example of this was students from lower-income families enrollments decreased, whereas higher-income families increased (Wang, 2013, p. 15). Li, Meng, Shi, & Wu (2013) contended that the increase in cost for HEI has led to poverty in China. Higher education was supposed to be a gateway that alleviated poverty and improved social

mobility (Li et al., 2013). The Chinese government made attempts to help poverty-stricken students, where they set-up special state grants of 800 million yuan in 2005 and in 2009 provided merit-based aid in the amount of Y9.3 billion yuan (Li, Meng, Shi, and Wu, 2013, p. 974). However, findings indicated that campus poverty was a major issue; 22% of college students lived in poverty, 32% were rural areas, and 28% were from West China (Li, Meng, Shi, & Wu, 2013, p. 988).

Value Differences Between Undergraduate Degrees in China and the United States on alumni, award, HICI, N&S and PUB

Turner and Lindsteadt (2012) researched alumni and value qualitatively and found the intersection through networking. There were many rich pieces of advice provided such as leveraging an existing internship and to build relationships to secure employment (Turner and Lindsteadt, 2012). Thomas (2017) addressed value and award in the context that HEIs are becoming increasingly competitive whereby academic awards are important. Academic awards were classified at the M level embracing equity, entitlement and expectation (Thomas, 2017). Giuffrida, Abramo and D'Angelo (2019) research suggested that all citations were not valued with the same weight. A major portion of the findings were due to the technology that data mined the information. Likewise, findings concluded that citation "n" are worth more than "n-1" (Giuffrida et al., 2019). Niles, Schimanski, Mckiernan and Alperin (2020) researched publishing decisions of academics. These decisions were based on variables such as publication rate, publication importance factors and perceptions (Niles et al., 2020). Alves (2010) posited that value and higher education index can be measured through perception. Alves analyzed a

common thread within the body of literature that perceived value of higher education is based on benefits and sacrifices where variables used to measure it are price, quality and experience (2010).

After extensive review, it can be seen that the literature did not answer the second proposed research question for this research “do relationships exist between or among the variables alumni, award, HiCi, N&S, PUB, and value from public 4-year universities in China and the United States between 2009–2019?” The research higher education value factors explored the “why” there is a difference in value between undergraduate degrees for accredited public 4–year universities in China and the United States. The research was needed because the academic literature provided irregularities on value and the higher education value factors chosen whereby the research question addressed with evidence-based research the differences in value between undergraduate degrees for accredited public universities in China and the United States and if they have a significant effect on them.

Measures of Effectiveness in HEI

The Dwight D. Eisenhower School for National Security and Resource Strategy (2016) explained that measures of effectiveness are current laws and policies that an organization can use to evaluate itself. For example, the United States HEIs may evaluate itself using Title IX, Federal Student Aid, and data collection methods. As the literature review has revealed, there was not an international value standard for HEIs. Due to the nonexistence of an international value standard, there equally did not exist

current law or policies that the United States HEI and China HEIs could have used to evaluate value or quality.

Therefore, for purposes of this research, the measures of effectiveness, pertained to "how good or correlated" the independent variables of "cost," and "utility" were to the dependent variable "value." The dependent variable for the study was value, as defined in a general sense. The independent variable for this study was cost (the price of a 4-year undergraduate degree) and utility (employment rate and earnings rate) of recent graduates from respective HEIs. Likewise, the measure of effectiveness measured how good or correlated the independent variables of alumni, awards, HiCi, N&S and PUB were to the dependent variable value. The measures of effectiveness were important because it solidified, within an international context, how the United States and China HEIs could evaluate their value. This was statistically analyzed by using excel with a two-population *t* test and multiple-variable regression.

Conclusion

As was demonstrated throughout the literature review, the gap in the academic literature was the notion that there was not an international value standard to measure what HEIs have agreed on, and/or can use as a comparison measurement of value, and specifically for the countries of the United States and China. Within the HEI community, accredited institutions and countries believed that value was essential. The definition of value for HEIs varied along with how to quantify and explain value. Likewise, with countries having different government approaches to policies and regulations for institutions, this added to the diversity on the topic. Transitioning into Chapter 3, the

reader will begin to read about the research design and methods of the study. The methodology will describe a quantitative analysis approach using an international value standard through the lens of a two-population *t*-test and multiple regression. Chapter 4 will analyze data collection and results. Finally, Chapter 5 will provide interpretations, recommendations, and social change implications.

Chapter 3: Research Methodology

Introduction

One intention that social scientists had through the process of research methodology was to analyze variables, seek answers to research questions, and test hypotheses. Research methodology also provided researchers the opportunity to link research approaches to data analysis, and ultimately to discover facts. The particular methodology chosen for this research was a comparative quantitative study through a two-population *t*-test and multiple regression. The two-population *t*-test measured the statistical significance using the *p*-value, while the multiple regression measured the Pearson Correlation Coefficient to test the level of significance through the strength of correlations.

The study's purpose was to define the value of undergraduate education and fashion an international value standard through a comparative analysis of China and the United States. There were many studies on the value of higher education; however, there was a gap in the literature that did not address a quantitative comparative approach of these themes (Zha, 2011; Bernhard, 2011). The research design was modeled after a quantitative non-experimental correlational research design as the variables were measured and not manipulated (Burkholder, 2106). This study was based on a blend of theoretical frameworks that included Roel's (2010) VTT and Ginsberg, Somekh, and Schlesinger's (2018) decision tree modeling through cost utility analysis. There was a comparative analysis of public four-year undergraduate HEIs from the U.S and China. The sample included HEIs from 2014 based on data from the United States Department

of Education and China's Ministry of Education. This study was based on secondary quantitative data from multiple sources. Data analysis was determined through a two-population *t*-test and multiple regression analysis.

Chapter 3 began with sections on Research Design. It was then followed by additional sections: Rationale, Methodology, Population, Sampling Procedures, Data Collection, Instrumentation and Materials, International Value Standard, Value, Cost, Employment Rate, Earnings Rate, HEI List, Data Analysis Plan, Research Questions 1 and 2, Threats to Validity, Construct Validity, Ethical Procedures, and finally a Summary.

Research Design and Rationale

The research design for this study was a quantitative non-experimental correlational research design as the variables were measured and not manipulated through a comparative framework. The quantitative approach was selected because it helped determine if a relationship existed between the variables of value, utility (as defined by earnings and employment), and cost. The quantitative analysis of the data created an instrument (an international value standard) to measure the potential relationship between utility and cost, driving toward a measure of value. Upon determining if the relationship existed, the next step was to compare the driving factor of the difference using five set variables through multiple regression. All data used was secondary. This choice was the best and most cost efficient in terms of time and funding. It also served as a time-efficient method for the research.

Data saturation was required by the original researchers upon collection and therefore, with this research as a quantitative secondary analysis, I agreed with the original researchers, and data saturation was met. Rigor was required by the original researchers upon collection and therefore, with this research as a quantitative secondary analysis, I agreed with the original researchers, and it was met. There was methodological appropriateness with the quantitative secondary analysis because the two-population *t*-test and multiple regression analysis were appropriate for this quantitative study.

The comparative approach of the United States and China quantitative data allowed me to create the international value standard. For this study, another reason the quantitative approach was appropriate was for the needs of objectivity and controlling for bias. With statistical analysis, the I had to note biases such as sampling biases and response biases. This study used secondary data and the potential for biases was addressed and mitigated.

I considered two other research methods for this study. The first was a qualitative approach and the second was mixed methods. Qualitative research includes 10 common methods: action, case study, ethnography and critical ethnography, evaluation, grounded theory, narrative, participatory action, phenomenology, and practitioner; each of them considers peoples' experiences and perspectives (Ravitch & Carl, 2016). A qualitative approach would have required both the United States and China HEIs individuals' experiences and perspectives as it related to value. Although qualitative studies add to the academic body of literature in a profound manner, the "international value standard"

would have been considered a subjective measure when approached from a qualitative manner. As Ravitch and Carl (2016) described qualitative bias: "in qualitative research, understanding and confronting the values and beliefs underlying decisions and approaches is vital and at the heart of the inquiry itself" (p. 13). Therefore, the qualitative approach was not aligned with the research goals, including the research questions and choice of secondary open sourced data.

Mixed-methods research is considered the "integration or mixing the quantitative and qualitative component within a study" (Plano, Clark, & Ivankova, 2016, p. 9). There are different approaches as to how "mixing" occurs. However, the fact with mixed methods research was there are at least two research questions: one that is quantitative in nature; the second that is qualitative in nature. Therefore, mixed methods was not aligned with the research goals, including the research questions and choice of secondary open sourced data.

Methodology

For this research effort I used the quantitative methodological approach which included the independent *t*-test and a multiple regression.

Population

A population is the representation of the entire pool where the sample is derived (Agresti & Finlay, 1999). The population for this study was all 4-year public higher education institutions in the world. Therefore, the sample institutions were drawn from two countries: the United States and China. The study population for the United States consists of 4,724 4-year public higher education institutions in total ((National Center for

Education Statistics, 2014; The Carnegie Classification of Institutions of Higher Education, 2010). This population represented 50 states and included the United States territories such as American Samoa, Federated States of Micronesia, and Guam. According to The National Center for Education Statistics and The Carnegie Classification of Institution of Higher Education, the United States HEI population is represented by private, public, research, 2-year, and 4-year institutions, and combinations thereof (National Center for Education Statistics, 2014; The Carnegie Classification of Institutions of Higher Education, 2010).

The listed population for China was 2,246 HEIs. The HEI list was diverse and categorized the HEIs into 31 sections, some of which include Beijing, Hubei, and Chongqing. According to the Ministry of Education in China, the HEI China population represented levels of learning at the regular and junior college level (Ministry of Education of the Peoples Republic of China, n.d.).

Sample Size and Sampling Procedures

The sampling procedures for this study aligned with the sampling techniques used by the original researchers for both the United States and China HEIs. Furthermore, the HEIs of the sample provided the highest probability of mirroring and representing the populations as best as possible. Therefore, I publicly accessed the data through the open sources of two secondary HEI lists; one for the United States Department of Education (2014) and the second for China Ministry of Education (2014). The sampling technique for the United States HEI list was based on the annual institutional characteristics of all postsecondary institutions in the United States and its territories (NCES Handbook of

Survey Methods, 2019). The sampling technique for the China HEI list was based on all of China's colleges and universities (Ministry of Education of the Peoples Republic of China, n.d.). For both the United States and China sampling techniques I agreed with the original researchers sampling procedures. I chose the year 2014 as the sample year for a number of reasons. First, the data were available for both the United States and China. Second, 2014 is the midpoint between the 2009–2019 range. Third, the 2014 data were considered a census of the HEIs. Finally, the power analysis, was based on assumptions: one which was that the sample was random (Statistical solutions, n.d). Given that the referenced sample data was categorized as census in nature a power analysis was not applicable for this research effort.

The defined sample size for the United States was 4-year public HEIs from the United States HEI list. The United States sample size was appropriate because the data were an open source secondary option from 2014. The United States list revealed that for the 2013–14 year, there was a total of 4,724 degree granting HEIs by control and level of institutions and state or jurisdiction. The source of the HEI list information came from The Carnegie Classification of Institution of Higher Education. The common variable between the list from the Department of Education and The Carnegie Classification of Institution of Higher Education was “BASIC2010” with the number 15–32. The numbers 15–32 indicated that the United States HEIs were in fact United States public 4-year institutions. The sample size therefore became 691 United States HEIs for all 50 states and its territories.

The defined sample size that I choose for China was 4-year public HEIs from the China HEI list as discussed earlier. The China sample was appropriate because the data were an open-source secondary option from 2014. The China HEI list indicated that for the 2013–14 year, there were 2,246 Regular Colleges and Universities (Ministry of Education of the Peoples Republic of China, n.d). The process to clean the 2013–2014 China HEI list was based on taking the junior colleges that did not have a label and labeling them as "public." Next, regular colleges that were not labeled were labeled public. This decision was based on the fact that China has a communist government. junior colleges were assumed as not 4 years e.g. vocational, technical. Therefore, the sample size of public 4-year institutions for China was 777. The final list was labeled as China's HEIs.

Data Collection

The secondary data were appropriate as a source for this research design. Secondary data were just as important as primary data because the quantitative data were already vetted. The data came from official government funded sponsorships within the United States and/or China or they were from international organizations whose data were reliable, relevant and had principals that govern their statistical methodology (Data, n.d). Likewise, the secondary data were less time consuming as it allowed for easy and free access to open sources (Babbie, 2017). This was the case between the United States and China where travel was not needed. In this study I merged secondary quantitative data sets together based on the United States and China.

The first step I took in the procedure for data collection was the creation of a master data folder. The second step was to store all secondary data files in the master data folder. The third was to create an excel master spreadsheet with a tab titled data collection beginning with the first column as: variable names, variable labels, name of website and types of secondary sources. See Table 7 below.

Table 7

Data collection method

Variable name	Variable Label	Name of Website	Type of Secondary Source
U.S. Employment Rate	USEMR	U.S. Bureau of Labor Statistics	Government
U.S. Earning Rate	USERR	United States Census Bureau	Government
U.S. Cost	USC	Digest of Education Statistics 2014	Government
U.S. Alumni	USAL	The Academic Rankings of World Universities website	International Organization
U.S. Award	USAW	The Academic Rankings of World Universities website	International Organization
U.S. HiCi	USHI	The Academic Rankings of World Universities website	International Organization
U.S. N & S	USNS	The Academic Rankings of World Universities website	International Organization
U.S. PUB	USPUB	The Academic Rankings of World Universities website	International Organization
U.S. Value	USV	Calculated	Calculated
China Employment Rate	CEMR	Statista	Government
China Earning Rate	CERR	National Bureau of Statistics of China	Government
China Cost	CC	Higher Education in China	Ebook
China Alumni	CAL	The Academic Rankings of World Universities website	International Organization
China Award	CAW	The Academic Rankings of World Universities website	International Organization
China HiCi	CHI	The Academic Rankings of World Universities website	International Organization
China N & S	CNS	The Academic Rankings of World Universities website	International Organization
China PUB	CPUB	The Academic Rankings of World Universities website	International Organization
China Value	CV	Calculated	Calculated

Note. Variable titles were used exclusively by the research approach.

Data collection for international value standard.

I downloaded the referenced data set of the United States employment rate by collecting it from the United States Bureau of Labor Statistics website. I then transferred the data into the master excel spreadsheet and created a tab titled United States employment. The data were organized with Column A labeled as year beginning with 2009 through 2019, Column B labeled as United States employment and Column C labeled as United States unemployment (Databases, Tables & Calculators by Subject, n.d.). Next, I downloaded the referenced data set of China's employment rate by collecting it from the Statista website. I transferred the data into the master Excel spreadsheet and created a tab titled China Employment. The data were organized with Column A labeled as year beginning with 2009 through 2019, Column B labeled as China employment (Share of employed people in the Chinese population from 2009 to 2019, n.d.).

Then, I downloaded the referenced data set of United States earning rate by collecting it from the United States Census Bureau website (Income and poverty in the United States 2018, 2020). I transferred the data into the master excel spreadsheet and created a tab titled United States earning. This data were organized with Column A labeled as year beginning with 2009 through 2019, Column B labeled as United States earning whereby the data were set up for further cleaning and analysis. I downloaded the referenced data set of China earning rate by collecting it from the National Bureau of Statistics of China website (Annual by province, n.d.). I then transferred the data into the master excel spreadsheet and created a tab titled China earning. The data sets were

organized with Column A labeled as region, Column B labeled as 2019 Yuan, Column C labeled as 2019 USD and through 2009. The data were set up for further cleaning and analysis.

I downloaded the referenced datasets of United States cost by collecting it from the Digest of Education Statistics 2014 website (National Center for Education Statistics, 2014). I then transferred the data into the master excel spreadsheet and created a tab titled United States cost. The data were organized with Column A labeled year and Column B United States cost. The data were set up for further cleaning and analysis.

I then downloaded the referenced datasets of China cost by collecting it from the ebook Higher Education in China for China's data (Gu, et al., 2019). The data were organized with Column A labeled year and Column B United States cost and Column C China cost. The data was set up for further cleaning and analysis.

The aforementioned data's original intention was not for an "international value standard." Therefore, two more tabs were created in the master excel spreadsheet; United States value and China value. Each tab had columns labeled United States value and China value. The columns were labeled as the following: year, value, cost, employment and earnings. The international value standard as previously noted were calculated using the following equation:

$$V = (EMR * ERR) / C$$

Afterwards, a new excel spread sheet was created with six tabs: t-test, United States multiple regression, China multiple regression, earnings data, employment data and cost data. The data from the master excel spread sheet were transferred into it.

Data collection for two-population *t*-test.

Organization continued within the master excel spreadsheet by creating another tab labeled “T-test Output.” The first set of columns were labeled as the following: United States year, United States value, employment, earnings and cost. Placed below the United States data, was the China data, labeled as the following: China year, China value, employment, earnings and cost. The data were set up for further cleaning if needed and analysis through excel for the two-population *t*-test.

Data collection for multiple regression analysis.

The procedure for data collection for the variables alumni, award, HiCi, N&S, and PUB all practiced the same the method. The referenced variables for the multiple regression were collected from the Academic Rankings of World Universities website for both the United States data and China data and stored in the data folder as a raw data excel file (Academic Rankings of World Universities 2019, n.d.). I then transferred the data after cleaning and sorting into the master excel spreadsheet and created a tab titled United States multiple regression and China multiple regression.

Instrumentation and Materials

The research method for this study was quantitative in nature. By applying quantitative methods, I first applied the international value standard when calculating the two-population *t*-test. The dependent variable for the research study was value (*v*). The

value of HEIs was determined by taking utility and dividing it over cost (Mihram & Murphy, 2008; Resnick, Tosteson, Groman, & Ghogawala, 2014). As was previously discussed within the literature review chapter, value as it relates to higher education had multiple meanings. For example, Chapman and Lindner (2016), higher education was discussed through the context of corruption which therefore showed how higher education was devalued. Hongjuan (2018) analyzed higher education institutions by looking at their transition from the tradition model of four-year brick and mortar lectures to learning institutions. Finally, Bartlett, Han, and Bartlett (2018) studied Chinese students studying abroad in the United States and the value of their degree finding different motives.

Instrumentation and two-population *t*-test.

The two-population *t*-test specifically was used to determine if there is a difference in calculation between the United States and China's population. The two-population *t*-test had five steps to it: assumption, hypotheses, test statistic *t*-test, *p*-value and conclusion. The *p* value analysis cited that the smaller the *p* number the greater the proof in opposition of the null hypothesis and in support of the alternative hypothesis (Agresti and Finlay, 1999, p. 184). Reliability in the most basic definition was the ability to gauge consistency in the research and to have the research repeatable (Babbie, 2017, p. 149). There was evidence for reliability with this research as it had the ability to be repeatable with likely similar results. Therefore, it can continue on into the 2020 secondary databases. If the 2020 numbers were not available (as some were not with the current research), the researcher would follow the same path averaging data and using the

inflation calculator to obtain data as a predictive means. Validity in the most basic definition is the test that gauges if the research evaluated was what it was supposed to be (Babbie, 2017, 152). For this research the validity measurement was based on value. The value factor was valid because utility and cost were variables that significantly affected HEIs and met the literature-supported definition of value.

Instrumentation and multiple regression analysis.

After, the two-population *t*-test was performed, a multiple regression was performed. The multiple regression analysis was the analysis of the simultaneous relationships among several variables (Babbie, 2017, p. 440). Therefore, the multiple regression in this research used the variables: alumni, award, Hici, N&S and PUB. Refer to the Chapter 2 discussion on variable identification and explanation. The multiple regression with the international standard value provided the level of significance through the strength of correlation.

Operationalization

In research, operationalization can be categorized in four ways; nominal, ordinal, interval, or ratio (Babbie, 2017). For purposes of this research all data were categorized as ratio data and was shown in both Table 8 and 9.

Table 8

Variable categorization and nomenclature U.S.

Variable name	Measurement	Variable Typology
U.S. Employment Rate (USEMR)	Ratio	Independent
U.S. Earning Rate (USERR)	Ratio	Independent
U.S. Cost (USC)	Ratio	Independent
U.S. Alumni (USAL)	Ratio	Independent
U.S. Award (USAW)	Ratio	Independent
U.S. HiCi (USHI)	Ratio	Independent
U.S. N & S (USNS)	Ratio	Independent

U.S. PUB (USPUB)	Ratio	Independent
U.S. Value (USV)	Ratio	Dependent

Note. Variable titles were used exclusively by the research approach

Table 8 headings provided the variable name, measurement and variable typology. An example of a row from Table 8 was USERR, ratio and independent. A second example of a row from Table 8 was USHI, ratio and independent. A third example from Table 8 was USV, ratio and dependent.

Table 9

Variable categorization and nomenclature China

Variable name	Measurement	Variable Typology
China Employment Rate (CEMR)	Ratio	Independent
China Earning Rate (CERR)	Ratio	Independent
China Cost (CC)	Ratio	Independent
China Alumni (CAL)	Ratio	Independent
China Award (CAW)	Ratio	Independent
China HiCi (CHI)	Ratio	Independent
China N & S (CNS)	Ratio	Independent
China PUB (CPUB)	Ratio	Independent
China Value (CV)	Ratio	Dependent

Note. Variable titles were used exclusively by the research approach.

Table 9 headings provided the variable's name, measurement, and variable typology. An example of a row from Table 9 was CERR, ratio and independent. A second example of a row from Table 9 was CHI, ratio and independent. A third example from Table 9 was CV, ratio and dependent.

The ratio data for this research had a specific number assigned to the variable. An example of ratio data for this research would be the cost of a college education; whereby I was able to gather data for a 4-year public accredited United States HEI education and China HEI education. Specifically, the ratio variable 2014 United States cost was an

independent number equaling \$18,682 while the ratio variable 2014 China cost was an independent number equaling \$706.91.

Although it may seem contradictory, the international value standard created in this research equally was categorized as ratio. There was a number assigned to the variable value by the three ratio numbers of cost and utility. A value in this research can be either -0 to positive 0 and therefore this translated to a meaning that there can be a value attached to HEI and higher education in general. All aforementioned variables maintained consistency within the referenced research. In other words, the independent variables and dependent variables did not switch as the research questions unfolded.

Data Analysis Plan

The data analysis plan had three parts: the international value standard, two-population *t*-test, and then a multiple regression. As previously noted, all variables were organized and then analyzed through Microsoft Excel and SPSS. Some of the secondary data sets were provided “ready to use” while other data sets needed cleaning and sorting for this particular research. There were no covariates or confounding variables used for this research.

Data analysis plan and international value standard.

The United States earning dataset required cleaning and screening procedures. Therefore, I used an inflation calculation to obtain a full decade of data (Income and poverty in the United States 2018, 2020). The China earning data set required cleaning and screening procedures. Therefore, I obtained the entire China earning dataset (2009–

2019) by taking the average of each year and then used an inflation calculator with averaged numbers obtained. The data were then consolidated further with Column A labeled as year beginning with 2009 through 2019 and Column B labeled as China earning (Annual by province, n.d.). The United States cost dataset required cleaning and screening procedures. Therefore, in order to obtain all years (2009–2019) of the dataset I used an inflation calculator (National Center for Education Statistics, 2014). The China cost dataset required cleaning and screening procedures. Therefore, to obtain all years (2009–2019) of the China dataset I first converted the 2014 cost from Yuan to USD and then used an inflation calculator (Gu, et al., 2019). The United States and China datasets for alumni, awards, HiCi, PUB and N&S required cleaning and screening procedures. Therefore, for 2009 I took the average of the data provided for Alumni (both United States and China) and came up with the calculated 2009 ratio number. I then repeated this process for the other four variables for both the United States. and China for 2009 and then repeated this process for 2010 through 2019 (Academic Rankings of World Universities 2019, n.d.).

Data analysis plan and two-population *t*-test.

A two-population *t*-test was performed to determine the difference in calculation between the United States and China's HEIs. All data were organized and cleaned. At this point, was able to run a two-population *t*-test in Microsoft Excel. This portion of the data analysis used both countries data simultaneously. The results were interpreted using the *p* value. If the *p* value is less than 0.05 then I will reject my null hypothesis and if it is greater than 0.05 then I will fail to reject my null hypothesis.

The first research question is: “To what extent if any is there a difference in value between undergraduate degrees for accredited public 4-year universities in China and the United States between 2009–2019?” The null hypothesis is: “The differences in value between undergraduate degrees for accredited public 4-year universities in China and the United States are equal.” The alternative hypothesis is: “The differences in value between undergraduate degrees for accredited public 4-year universities in China and the United States are unequal.”

Data analysis plan and multiple regression.

After the two-population *t*-test was performed to determine the difference between United States and China, a multiple regression was performed. The multiple regression analyzed predictors for the difference in value for each country between undergraduate degrees for accredited public 4-year universities between 2009–2019 using the following variables: alumni, award, HiCi, N&S and PUB. The five preceding variables practiced the same data analysis plan for both the United States and China. Beginning with the 2009 United States and China HEIs, I took the average of each variable (alumni, award, HiCi, N&S and PUB) to have a consistent ratio number for 2009-2019.

After obtaining the data, I ran the multiple regression. The multiple regression was used to determine the second research question: “do relationships exist between or among the variables alumni, award, HiCi, N&S, PUB, and value from public 4-year universities in China and the United States between 2009–2019”? The Pearson correlation coefficient also known as “*r*” was used to examine the level of significance

and effect size of the predictors. The strength of the relationship will fall within the range of -1 to +1 (Frankfort-Nachmias & Leon Guerro, 2015). Zero will indicate that there is no relationship of the variables where +1 will indicate that there is a perfect relationship between the variables (Frankfort-Nachmias and Leon Guerro, p. 444, 2015). The number, or “absolute value” of (r) will indicate the strength of the linear relationship of the variables as depicted in Tables 8, 9 and 10 (Frankfort-Nachmias and Leon Guerro, p. 444, 2015).

Table 10

Data analysis plan

Test	Software	RQs	Hypotheses	Interpretation
International Value Standard	Microsoft Excel	n/a	n/a	
Two-population <i>t</i> -test	Microsoft Excel	To what extent if any is there a difference in value between undergraduate degrees for accredited public 4-year universities in China and the U.S between 2009-2019	Null: The differences in value between undergraduate degrees for accredited public universities in China and the U.S. are equal Alternative: The differences in value between undergraduate degrees for accredited public universities in China and the U.S. are unequal	P value
Multiple Regression	Microsoft Excel & SPSS	Do relationships exist between or among the variables Alumni, Award, HiCi, N&S, PUB, and value of a degree from a 4-year university in China and the U.S between 2009-2019?	Same	Pearson Correlation Coefficient aka R

Note. Variable titles were used exclusively by the research approach.

Threats to Validity

Internal Validity

Burkholder et al. (2016) defined validity as the concept of truth where in research valid findings described the study (p. 104). Burkholder et al. (2016) also explained that possible internal validity threats were: history, maturation, testing, instrumentation, statistical regression to the mean, researcher bias, selection, overall mortality, and differential mortality (p. 114). For this research study, one internal validity threat was maturation. This internal validity threat addressed the component that individuals and organizations change over time e.g. HEIs changing over time, employment rate changing over time, etc. (Burkholder, 2016, p. 115). A second internal validity threat was selection. This internal validity threat addressed the component that there were purposefully selected participant groups which may have yielded two groups that were not equivalent at the beginning of the study (Burkholder, 2016, p. 115). Therefore, if the groups were not equivalent at the beginning of the study any post-test differences were because of treatment effect, or the differences (Burkholder, 2016, p. 115).

External Validity

Burkholder et al. (2016) explained that possible external validity threats were: interactions of the observed causal relationship with sample units, treatment variations, types of outcome measures used, settings in which the treatment was delivered and context dependent mediation (p. 118). For this study one external validity threat was setting for which treatment is was delivered (Burkholder et al., 2016, p. 118). This study

was based on a quantitative comparative analysis therefore the setting component was a factor.

Construct Validity

The construct validity is the degree to which a test measures what it claims or purports to measure. For this study a two-population *t*-test was one test used to measure the comparison of two populations. A two-population *t*-test is a widely regarded statistical analysis test used in many dissertations and published papers which has been verified as a valid test through basic statistical textbooks (Frankfort-Nachmias and Leon Guerro, 2015). Another test that was used for this study was a multiple regression; used to measure the strength of the relationship for the variables (er), (em) and (c). Multiple regression is a widely used test also used in many dissertations and published papers which has also been verified through basic statistical textbooks (Burkholder et al., 2016; Frankfort-Nachmias and Leon Guerro).

Ethical Procedures

This study was based on secondary quantitative data. Therefore, no consideration was needed for vulnerable populations. Likewise, there was no personal information gathered on individuals and organizations for the study. No data was gathered prior to the approval from Walden Universities Institutional Review Board (IRB). All data that was collected is stored in a locked folder for a five (5) year duration.

Summary

Open sources were used to gather data on HEIs for the United States and China to assess the value of undergraduate public 4-year degrees. The value of the United States

and China HEIs was based on an international value standard which I created. I was able to analyze the relationship of value to utility and cost through a two-population *t*-test and why there is a difference in value through the variable's alumni, award, HiCi, PUB and N&S. Transitioning into Chapter 4, there will be analysis of data collection and results. Chapter 5 will provide interpretations, recommendations, and social change implications.

Chapter 4: Results

Introduction

The study's purpose was to define the value of undergraduate education, and create an international value standard through a quantitative comparative analysis of China and the United States. The following research questions applied to address the previously identified research problem:

RQ1: To what extent if any is there a difference in value between undergraduate degrees for accredited public 4-year universities in China and the United States between 2009–2019?

RQ2: Do relationships exist between or among the variables alumni, award, HiCi, N&S, PUB, and value from public 4-year universities in China and the United States between 2009–2019?

H₀: The differences in value between undergraduate degrees for accredited public universities in China and the United States are equal.

H₁: The differences in value between undergraduate degrees for accredited public universities in China and the United States are unequal.

Chapter 4 includes data collection, data results and the international value standard, data results and the two-population *t*-test, data results, multiple regression, comparison of United States and China HEI regression variables, and a summary.

Data Collection

This research study met Walden University's ethical standards. The Institutional Review Board (IRB) approval number 10-09-20-0668766 was issued on October 9, 2020.

The time frame for the secondary data collection was 2009 through 2019. Therefore, there were no actual recruitment and response rates with respect to data collection, as it existed within an open-source construct. There were no discrepancies in data collection from the plan presented in Chapter 3, as all data were secondary and open source. The defined sample size for the United States was 4-year public HEIs from the United States HEI list. The sample size, therefore, was 691 United States HEIs for all 50 states and its territories. The defined sample size that I chose for China was 4-year public HEIs from the China HEI list. Therefore, the sample size of public 4-year institutions for China was 777 referenced in Table 11. The 2014 data were considered a census of the HEIs and this is why it is representative of the sample of the population of interest. There were no covariates used for this research study. There was no treatment and/or intervention fidelity used for this study.

Table 11

Participants and Sample Size

HEIs	Population	Sample Population
US HEIs	4,724	691
China HEIs	2,246	777

Note. Variable titles were used exclusively by the research approach.

With regard to the accuracy of the measured variable “value,” and in the context of higher education and HEIs, the definition of value was determined through quantitative methods by taking utility and dividing it by cost as confirmed by (Mihram & Murphy (2008). The value variable met the validity test as employment and earnings (utility) and cost were the variables for the measurement of HEIs, and supported the definition of value.

Research Question 1

RQ1 was: “To what extent if any is there a difference in value between undergraduate degrees for accredited public 4-year universities in China and the United States between 2009–2019?” This question was created to determine if there was a difference in value between the United States and China’s HEIs.

Data Results and International Value Standard

In addressing RQ1, an international value standard was first quantitatively created with the secondary data sources this research effort undertook coming from six sources (Databases, Tables, and Calculators by Subject, n.d.; Share of employed people in the Chinese population from 2009 to 2019, n.d.; Income and poverty in the United States 2018, 2020; Annual by province, n.d.; Gu, J., Li, X., Wang, L., 2018; National Center for Education Statistics, 2014). The international value standard takes the utility and divides it over cost referenced below:

$$V = (EMR * EER) / C$$

The international value standard was calculated and implemented for both the United States Value and China Value which can be seen in both Tables 12 and 13.

Table 12.

International Value Standard Data U.S.

YEAR	USV	USEMR	USERR	USC
2009	2.75	0.92	\$50,599.00	\$16,939.23
2010	2.59	0.90	\$49,445.00	\$17,217.08
2011	2.56	0.91	\$50,054.00	\$17,760.54
2012	2.58	0.92	\$51,017.00	\$18,128.09

2013	2.60	0.92	\$51,939.00	\$18,393.62
2014	2.68	0.93	\$53,657.00	\$18,692.00
2015	2.81	0.94	\$56,516.00	\$18,994.00
2016	2.88	0.95	\$57,617.00	\$19,017.60
2017	3.10	0.95	\$62,616.00	\$19,257.23
2018	3.08	0.96	\$63,179.00	\$19,667.40
2019	3.06	0.96	\$64,159.05	\$20,147.29

Note: Variable titles and names were used exclusively by the research approach. Names are the following: USV as US Value, USEMR as US Employment Rate, USEER as US Earning Rate and USC as US Cost as USC.

Table 12 provided the international value standard data for the United States. The heading is as follows: Year, USV, USEMR, USERR and USC. The year provided for the data was from 2009–2019. One variable that affected the USV was USEMR where from 2009 through 2019 USEMR had an average 0.93; beginning with 0.92 and ending with 0.96. Another variable that affected the USV was USC where from 2009 through 2019 USC had an average of \$18,565.00; beginning with \$16,939.23 and ending with \$20,147.29.

Table 13

International Value Standard Data China

YEAR	CV	CEMR	CERR	CC
2009	2.58	0.684	\$2,420.52	\$640.62
2010	2.87	0.68	\$2,745.90	\$651.13
2011	3.28	0.676	\$3,256.13	\$671.68
2012	3.73	0.674	\$3,793.34	\$685.58
2013	4.22	0.672	\$4,367.84	\$695.63
2014	4.62	0.67	\$4,871.84	\$706.91
2015	4.91	0.667	\$5,284.53	\$718.36
2016	5.26	0.664	\$5,694.06	\$719.22
2017	5.51	0.662	\$6,064.45	\$728.29
2018	5.74	0.657	\$6,503.81	\$743.80
2019	5.91	0.652	\$6,911.83	\$761.95

Note: Variable titles and names were used exclusively by the research approach. Names are the following: CV as China Value, CEMR as China Employment Rate, CERR as China Earning Rate and CC as China Cost.

Table 13 provided the international value standard data for China. The heading is as follows: year, CV, CEMR, CERR and CC. The year provided for the data was from 2009–2019. One variable that affected CV was CEMR where from 2009 through 2019 CEMR had an average of 0.67; beginning with 0.68 and ending with 0.65. Another variable that affected the CV was CC. From 2009 through 2019 CC had an average of \$702.11; beginning with \$640.62 and ending with \$761.95.

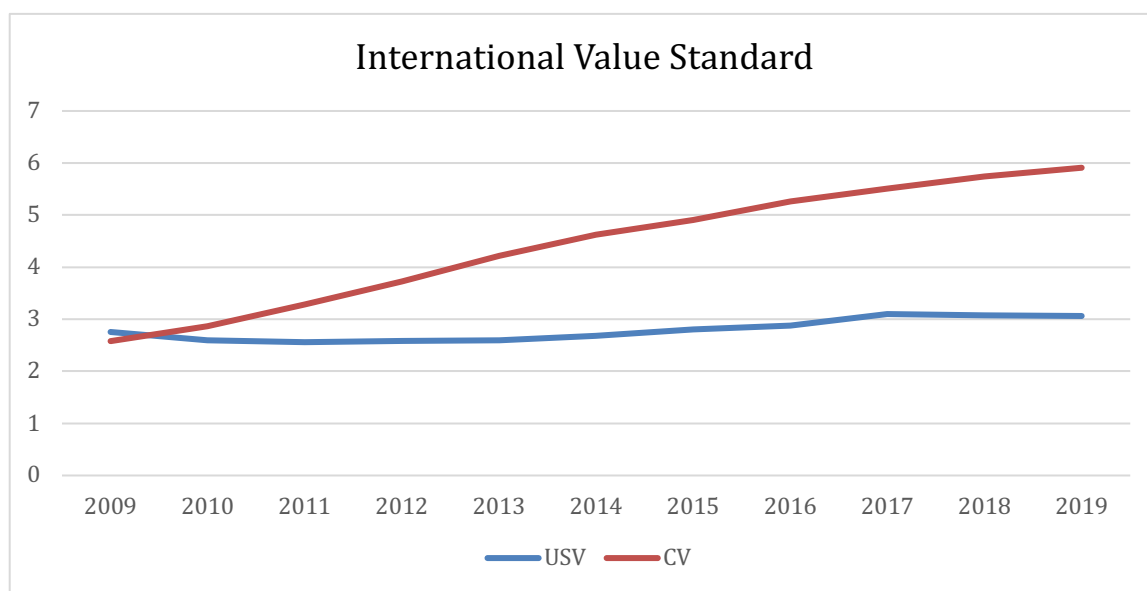


Figure 3. International Value Standard Comparison

Figure 3 displayed a similarity between the USV and CV in 2009. Both began around the same number, with USV at 2.75 and CV at 2.58. However, the value of the United States from 2009 through 2019 increased from 2.75 to 3.06. The USV increased with a positive numeric score. Additionally, the USV increased with an average 2.79 during the time period 2009 through 2019. Compared to China, the USV had a less significant growth in value over the time period 2009 through 2019. The value of China from 2009 through 2019 increased 2.58 to 5.91. The CV increased with a positive

numeric score. Additionally, the CV increased with an average 4.42 during the time period 2009 through 2019.

Data Results and Two-Population *t*-Test

After the international value standard was calculated, a two-population *t*-test was computed. The purpose of the two-population *t*-test was to see if there was a difference in value between the United States and China HEIs. Table 14 displayed the results of the two-population *t*-test.

Table 14

Two-population t-test

	USA Value	China Value
Mean	2.789949488	4.420969959
Variance	0.044551306	1.376097159
Standard Deviation	.2121	1.1730
Observations	11	11
Hypothesized Mean Difference	0	
df	11	
t Stat	-4.53850106	
P(T<=t) one-tail	0.000422972	
t Critical one-tail	1.795884819	
P(T<=t) two-tail	0.000845943	
t Critical two-tail	2.20098516	

Note: Variable titles were used exclusively by the research approach.

Table 14 provided the two-population *t*-test and descriptive statistics for the HEIs of the United States and China. The USV mean was 2.79 and CV mean was 4.42 CV. The observation size of 11 was based on the number of years (2009–2019) for both the United States and China whereas the sample size of the United States was 691 and the sample size of China was 777. The variables were quantitative in nature.

RQ1 Findings

China's mean value ($M = 4.42$, $SD = 1.17$) was higher than the United States mean value ($M = 2.79$, $SD = .21$). The difference was statistically significant, $t(11) = -4.54$, $P < .001$. Since the P -value was less than 0.05, the null hypothesis was rejected and it was concluded the HEI mean value between the United States and China were not equal to one another. The alternative hypothesis was accepted, where there was a difference in value between undergraduate degrees for accredited public 4-year universities in China and the United States from 2009–2019. The effect size based on Cohen's d was calculated by $(M1\ 4.420969 - M2\ 2.789949) / SD\ pooled\ 0.842887 = 1.935041$. As a result the calculated Cohen's d provided insight of a large effect size as it was over the threshold 0.08. There was no post-hoc analysis. There were also no additional statistical tests of hypothesis that emerged from the two-population t -test.

For this study I specifically addressed the research problem that the HEI international community did not have an international value standard. With my research, I created an international value standard and compared the two countries of the United States and China. Those two countries were necessary as the first step addressing the gap of HEI value. Therefore, I was able to define what value meant and obtained evidence for an international value standard as a foundation for HEIs across the globe. After I implemented the two- population t -test, RQ1 addressed and answered the research problem by retaining the international value standard (using the independent variables utility and cost) and answered is there a difference in value of 4-year public undergraduate HEIs between the United States and China where the answer was yes.

Two-population *t*-test assumptions.

The statistical assumptions for a two-population *t*-test were the following: i) the data was continuous, ii) the data was based on the normal probability distribution, iii) the data was independent and large with $n > 30$ and, iv) the data from both samples were random (Rajaretnam, 2015, p. 129). All four assumptions were met for the two-population *t*-test as the data were continuous (all ratio), based on the normal probability distribution, independent and large (see discussion of secondary open-source data sets in Chapter 3), and samples being at random (see discussion in Chapter 3). The assumption test was conducted and found to be within the constraint of the two-population *t*-test.

In the alternative, if I were to approach this research using the non-parametric route, the “go-to” test would be the chi-square test. The chi-square offers “the goodness-of-fit tests.” Since all assumptions were met there cannot be a “specific” chi-square test to recommend; only the discussion that there are specific chi-square tests available such as testing the hypothesis that a distribution of data is from a normal population and goodness-of fit test: unequal expected frequencies (Frampton, 2013).

Research Question 2**Data Results and Multiple Regression**

“Do relationships exist between or among the variables alumni, award, HiCi, N&S, PUB, and value from public 4-year universities in China and the United States between 2009–2019?” Research Question 2 was created to determine “why” there is a difference in value between the United States and China HEIs. The United States and

China multiple regression was implemented after the two-population t-test in this research study.

United States Multiple Regression

Table 15 provided the United States Multiple Regression Data which included the variables United States year, USV, USAL, USAW, USHICI, USNS and USPUB. The multiple regression was ran in excel where USV was entered as the dependent variable and USAL, USAW, USHICI, USNS and USPUB were entered as the independent variables by following the steps of data analysis and regression.

Table 15

Data for United States Multiple Regression to Predict HEI International Value Standard

US YEAR	USV	USAL	USAW	USHICI	USNS	USPUB
2009	2.75	11.54	11.24	26.04	21.39	40.39
2010	2.59	11.38	11.20	25.87	21.51	40.05
2011	2.56	11.63	11.62	26.51	22.37	39.93
2012	2.58	11.05	11.99	26.58	22.27	39.67
2013	2.6	11.27	12.23	26.84	22.12	39.31
2014	2.68	11.35	12.36	24.36	22.61	40.04
2015	2.81	11.14	12.38	24.45	21.58	39.84
2016	2.88	12.02	13.20	23.51	22.44	41.26
2017	3.1	11.99	13.40	25.74	22.13	42.13
2018	3.08	11.97	13.31	22.24	21.70	42.89
2019	3.06	8.81	9.38	16.01	16.39	36.23

Note: Variable titles were used exclusively by the research approach.

An example of a row from Table 15 was 2010, USV 2.59, USAL 11.38, USAW 11.20, USHICI 25.87, USNS 21.51 and USPUB 40.05. A second example was 2015, USV 2.81, USAL 11.14, USAW 12.28, USHICI 24.45, USNS 21.58 and USPUB 39.84. The U.S multiple regression variables and data were based on the international value standard that was created for this research effort.

Table 16

United States Multiple Regression “R’s”, “Standard Error” and “Observation”

<i>R</i>	<i>R</i> ²	Adj <i>R</i> ²	SE	Obs.
0.976	0.952	0.905	0.065	11

Note: *R* was defined as Multiple *R*; *R*² was defined as *R* Square; Adj *R*² was defined as Adjusted *R* square; SE was defined as Standard Error; and Obs. defined as Observations.

Table 16 provided the basic multiple regression output for the United States. An *R* of "0" indicates there was no relationship of the variables where an *R* of +1.0 will indicate that there was a perfect positive relationship. The multiple *R* is 0.976 and therefore closely lies towards the +1. The *R*-square was 0.952. The adjusted *R*-square was 0.905. The standard error was 0.065 and the observations was 11 whereby the descriptive statistics of the sample size was 691 for the United States HEIs.

Table 17

ANOVA United States

	DF	SS	MS	F	F Sig.
Regression	5	0.427	0.085	20.007	0.003
Residual	5	0.021	0.004		
Total	10	0.448			

Note: DF defined as degrees of freedom; SS defined as Sum of Squares; MS defined as Mean Squares, F defined as F statistic; and F Sig. defined as F significance.

Table 17 provided the output results from the Analysis of Variance (ANOVA) calculations. The *F*-value was reported in the ANOVA table, along with its level of significance where the *F* value was 20.007 and the significance was 0.003. Therefore, the table read as follows: $F(5, 5)=20.007, p<.05$ where the regression model was considered a good fit of the data, and was found to be statistically significant.

Table 18

United States Multiple Regression Predicting HEI International Value Standard

	B	β	SE	<i>t</i>	<i>p</i>	95% CI
Intercept	2.450		1.177	2.081	0.092	[-0.575, 5.476]
USAL	0.038		0.136	0.281	0.790	[-0.311, 0.387]
USAW	0.169		0.052	3.242	0.023	[0.035, 0.303]
USHI	0.0001	-.973	0.018	0.008	0.994	[-0.046, 0.047]
USNS	-0.198		0.056	-3.529	0.016	[-0.342, -0.054]
USPUB	0.053	.676	0.053	0.999	0.366	[-0.084, 0.191]

Note: B was defined as unstandardized coefficient; β was defined as standardized coefficient; SE defined as Standard Error; *t* defined as *t* stat; *p* defined as P-value; 95% CI defined as upper and lower 95% confidence intervals.

Table 18 was based on the confidence interval of 95%. There were three main components to Table 18. Of the five predictor variables, two were significant. They were USAW, a predictor variable that was positively significant with a P-value of 0.023 and USNS, a predictor variable that was negatively significant with a P-value of 0.016. Therefore, the USAW was the “stronger” predictor based on the standardized coefficient (β). Another important piece Table 18 provided was through the coefficients data. If there was a positive or negative sign this provided whether the data was significantly affecting in a positive or negative manner. Therefore, USNS had a negative significance and correlation with value.

United States Multiple Regression Findings

As can be seen from the United States Multiple Regression Model: USAL, USAW, USHI and USPUB were positively correlated with USV; while USAW was positive and significant. This evidence concluded that there was a positive difference in United States Value answering the “why” component of the value difference between the

United States and China. On the other hand, the independent variable USNS was negative and significant. Since the alpha was 0.05, and the two P-values were USAW at 0.023 and USNS at 0.016, the null hypothesis was rejected, and we conclude that relationships do exist between or among the variables alumni, award, HiCi, N&S, PUB, and value for public 4-year universities in China and the United States between 2009–2019. Finally, the USV model can be written as the following:

$$USV = 2.450 * 0.039USAL + 0.169USAW + 0.000USHI + (-0.198) USNS \\ +0.053USPUB$$

The effect size was not applicable. There was no post-hoc analysis. There were equally no additional statistical tests of hypothesis that emerged from the United States Multiple Regression.

Again, the research problem for this study addressed the notion that the HEI international community did not have an international value standard comparing the two countries of the United States and China, and thus the gap of value in the HEI context. Research Q2 was able to address and answer the research problem by assessing the five independent variables of alumni, award, HiCi, N&S and PUB. In that light, from the United States perspective the variable USAW was able to answer the research problem by showing the second portion of this research study of “why” there was a difference in value in a positive and significant manner. The specific variables circle back to the

research problem verifying the international value standard and the necessary need to address and close the gap of value.

United States multiple regression model assumption.

The statistical assumption for a multiple regression as it related to the U. S. Multiple Regression were the following: i) two or more independent variables (x) and one dependent variable (y) creating a linear relationship, ii) independence (residuals do not grow), iii) homoscedasticity, and iv) normality (Rajaretnam, 2015, p. 201). The assumptions were met for the U. S. Multiple Regression test as there was one dependent variable (USV) and five independent variables (USAL, USAW, USHICI, USNS, and USPUB) creating a linear relationship, there was independence, no homoscedasticity, and normality. Using the liberal threshold of ten which indicated redundancy of the other variables, one variable (USAL) broke the threshold of ten at 21.36. The lowest variable (USAW) was at 1.29 using Table 19 under the SPSS VIF column. This research effort shared the same philosophy O'Brien (2007) did using a "pragmatic" approach where the threshold for the Variance Inflation Factor (VIF) analyzation (ten) will not be the exact cut off point. As O'Brien (2007) stated:

If a regression coefficient is statistically significant even when there is a large amount of multi-collinearity – it is statistically significant in the 'face of that collinearity'. It is no more appropriate to question its statistical significance because there is multi-collinearity than to question a statistically significant relationship (at a specified level) because the variance explained by the model is low (O'Brien, 2007, p. 683). Table 19 also provides the United States VIF calculation from excel which were

different results. Likewise, the results were all above 10 and therefore the independent variables would be categorized to have multicollinearity. Although with this row (U.S Excel VIF), the independent variables would not be able to explain why there was a difference in value it would still be consistent to predict value given the correlation.

Table 19

United States VIF Data

U.S. Variables	Excel VIF	SPSS VIF
USAL	2116.44881	2.147
USAW	642.735751	1.289
USHI	507.332918	4.050
USNS	2359.28649	1.289
USPUB	810.958014	21.356

Note: Variable titles were used exclusively by the research approach.

With respect to the United States data, the P-P plot referenced in Figure 4, there were 11 observations; where ten fell close to the line with the exception to one. In other words, the lines closely follow a linear path indicating that the regression residuals are normally distributed. The referenced P-P plot provided evidence that the regression was

implemented to its potential with the data provided (i.e., it is a general linear relationship allowing regression to be used as valis test).

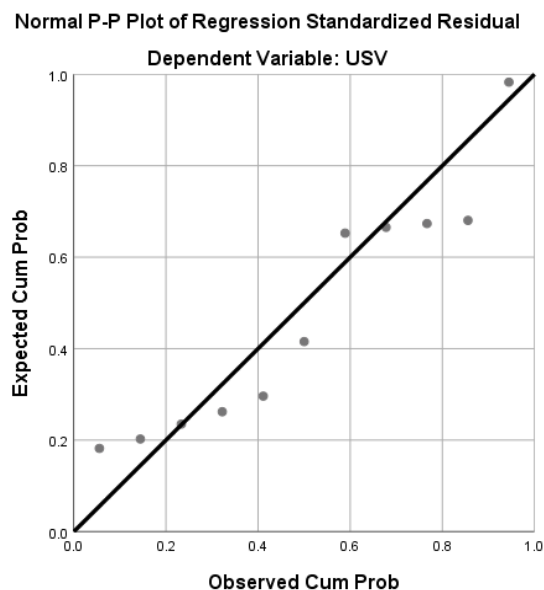


Figure 4. P-P Plot for U.S. Regression

China Multiple Regression

Table 20 provided the China Multiple Regression Data which included the China Year, CSV, CAL, CAW, CHICI, CNS and CPUB. The multiple regression was ran in excel where CV was entered as the dependent variable and CAL, CAW, CHICI, CNS and CPUB were entered as the independent variables by following the steps of data analysis and regression.

Table 20

Data for China Multiple Regression to Predict HEI International Value Standard

China YEAR	CSV	CAL	CAW	CHICI	CNS	CPUB
2009	2.58	0.55	0	3.29	5.37	41.51
2010	2.87	0.44	0.52	2.93	5.73	42.91

2011	3.28	0.42	0.50	3.75	6.88	41.97
2012	3.73	0.33	0.44	3.24	6.91	42.21
2013	4.22	0.83	0.44	2.95	7.54	43.34
2014	4.62	0.75	0.00	5.93	7.89	44.69
2015	4.91	0.69	0.38	6.47	7.81	46.30
2016	5.26	0.79	0.30	11.89	7.44	44.24
2017	5.51	0.74	0.28	12.96	7.98	45.36
2018	5.74	0.66	0.25	13.80	8.03	47.82
2019	5.91	0.26	0.10	8.51	5.42	37.86

Note: Variable titles were used exclusively by the research approach.

An example of a row from Table 20 was 2010, CV 2.87, CAL 0.44, CAW 0.52, CHICI 2.93, CNS 5.73 and CPUB 42.91. A second example was 2015, CV 9.91, CAL 0.69, CAW 0.38, CHICI 6.47, CNS 7.81 and CPUB 46.30. The China multiple regression variables and data were based on the international value standard that was created for this research effort.

Table 21

China Multiple Regression "R's", "Standard Error" and "Observation"

R	R ²	Adj R ²	SE	Obs.
0.91163496	0.8310783	0.6621566	0.68132218	11

Note: Variable titles were used exclusively by the research approach.

Table 21 provided the basic multiple regression output for China again using the R to indicate if there was a relationship in the variables. An R of "0" indicated there was no relationship of the variables where an R of +1.0 will indicate that there is a perfect positive relationship. The multiple R was 0.912 and therefore closely lies towards the +1. The R-square was 0.831. The adjusted R-square was 0.662. The standard error was 0.681 and the observations was 11 whereby the descriptive statistics of the sample size was 777 for China's HEIs.

Table 22

ANOVA China

	<i>DF</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>F Sig.</i>
Regression	5	11.4190914	2.28381827	4.91990246	0.052567837
Residual	5	2.32099954	0.46419991		
Total	10	13.7400909			

Note: Variable titles were used exclusively by the research approach.

Table 22 provided the output results from the Analysis of Variance (ANOVA) calculations. The F-value was reported in the ANOVA table, along with its level of significance where the F value was 4.920 and the significance was 0.053. Therefore, the table read as follows: $F(5, 5)=4.920$, $p<.05$ where the regression model was considered a good fit of the data, and was found to be statistically significant.

Table 23

China Multiple Regression Predicting HEI International Value Standard

	<i>B</i>	β	<i>SE</i>	<i>t</i>	<i>p</i>	<i>95% CI</i>
Intercept	9.030		4.964	1.820	0.129	[-3.732, 21.790]
CAL	-0.421		1.764	-0.240	0.821	[-4.957, 4.114]
CAW	-0.451		1.338	-0.338	0.750	[-3.892, 2.988]
CHI	0.218	.835	0.064	3.410	0.020	[0.054, 0.384]
CNS	0.749		0.416	1.802	0.140	[-0.320, 1.817]
CPUB	-0.252		0.155	-1.634	0.163	[-0.650, 0.1450]

Note: B was defined as unstandardized coefficient; β was defined as standardized coefficient; SE defined as Standard Error; *t* defined as t stat; *p* defined as P-value; 95% CI defined as upper and lower 95% confidence intervals.

Table 23 was based on the confidence interval of 95%. There were three main components to Table 23. There was one P-value in Table 23 that was less than the significance level of 0.05 which provided that the null hypothesis can be rejected. The one P-value was CHI at 0.02. Another important factor of Table 23 were the

coefficients. If there was a positive or negative sign this provided whether the data was significantly affecting in a positive or negative manner. Therefore, CAL, CAW and CPUB all had a negative impact and correlation with value.

China Multiple Regression Findings

The R output was 0.912 and therefore indicated that there was a strong correlation among the independent variables CAL, CAW, CHI, CNS, and CPUB. As can be seen from the China Multiple Regression Model, the CHI was positively and significantly correlated with CV. This evidence concluded that there is a positive difference in China Value answering the “why” component of the value difference between the United States and China; using the variable of CHI. The independent variables CAL, CAW and CPUB are negative, and therefore insignificantly, correlated with CV. The F-value was reported in the ANOVA Table 26, along with its level of significance where the F-value was 4.92 and the significance was 0.053. For China, since the alpha was 0.05, and the P-value for CHI was 0.02 the null hypothesis is rejected and we conclude that relationships do exist between or among the variables alumni, award, HiCi, N&S, PUB, and value for public 4–year universities in China and the United States between 2009–2019. The CV model can be written as the following:

$$CV = 9.030 * (-0.421)CAL + (-0.451)CAW + (0.220)CHI + (0.749)CNS + (-0.252)CPUB$$

The effect size was not applicable. There was no post-hoc analysis. There were equally no additional statistical tests of hypothesis that emerged from the China multiple regression.

From the China perspective, the same process was used to address the research problem for this study (the lack of an international value standard, comparison of the United States and China and closing the gap of the value). Therefore, RQ2 addressed and answered the research problem by assessing the five independent variables of alumni, award, HiCi, N&S and PUB. In the China case, the variable CHI addressed the research problem answering why there was a difference in value in a positive and significant manner and again verifying the international value standard and how the gap of value was closed.

China multiple regression model assumption.

The statistical assumption for a multiple regression as it related to the China Multiple Regression were the following: i) two or more independent variables (x) and one dependent variable (y) creating a linear relationship, ii) independence (residuals do not grow), iii) homoscedasticity, and iv) normality (Rajaretnam, 2015, p. 201). The assumptions were met for the China Multiple Regression. Using the liberal threshold of ten which indicated redundancy of the other variables, no variables brook the threshold when analyzing the variance inflation factor (VIF) using Table 24; with the highest being CNS as 1.292 and the lowest CAW as 1.072. Since I have used the liberal number of ten and the highest number was 1.29, I would not recommend removing any variables as the data shows there is no redundancy. Ultimately, the SPSS VIF data and Excel VIF from

Table 24 provided evidence of the independent variables of why there is a difference between the United States and China Value. Additionally, as described in the United States section, this research effort shared the same philosophy O'Brien (2007) did using a "pragmatic" approach where the threshold for the Variance Inflation Factor (VIF) analyzation (ten) will not be the exact cut off point.

Table 24

China VIF Data

China. Variables	Excel VIF	SPSS VIF
CAL	5.91990246	1.133
CAW	22.7590197	1.072
CHI	4.7477377	1.000
CNS	5.69797449	1.292
CPUB	192.319281	1.275

Note: Variable titles were used exclusively by the research approach.

Figure 5 also provided the China P-P plot. There were 11 observations; where nine fell close to the line with the exception to two. In other words, the lines closely follow a linear path which indicated that the regression residuals were normally distributed. The referenced P-P plot provided evidence that the regression was implemented to its potential with the data provided.

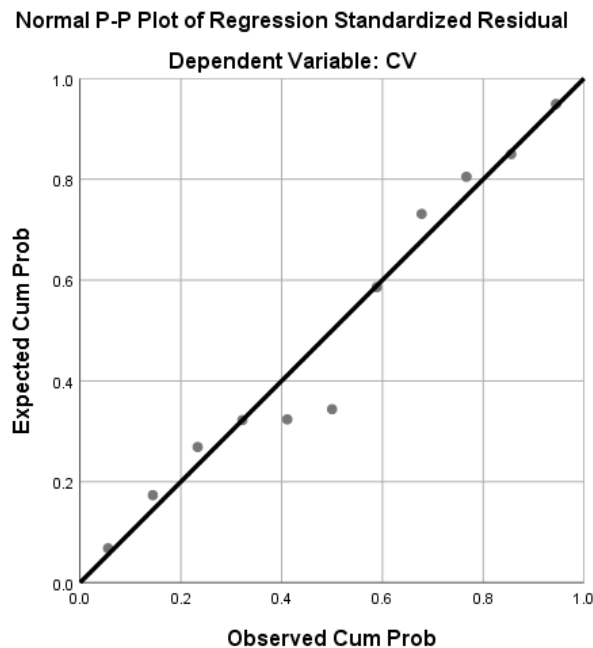


Figure 5. P-P Plot for China Regression.

Comparison of United States and China HEI Regression Variables

As previously noted, the following were the independent variables used for the United States HEI multiple regression: USAL, USAW, USHI, USNS, and USPUB. The independent variables used for the China multiple regression were: CAL, CAW, CHI, CNS, and CPUB. As can be seen from the United States Multiple Regression model USAL, USAW, USHI and USPUB were positive and significantly correlated with USV where with the China Multiple Regression model CHI and CNS were positively and significantly correlated with CV. For the time period of 2009 through 2019 it was noteworthy and significant to add for the comparison element that USNS was a negative and significant independent variable for the United States regression, while CNS was a positive and significant independent variable for the China United States regression.

Likewise, for the time period of 2009 through 2019, CPUB, CAL and CAW were a negative and significant independent variable for the China Multiple Regression while USPUB, USAL and USAW were positive and significant independent variables for the United States Multiple Regression.

Summary

In conclusion, the purpose for Chapter 4 was to provide the results of the secondary open source data that was collected for this quantitative comparative research study. The results of this study were provided within two sections; Research Q1 and Research Q2. This research effort sought two research questions: 1) to what extent if any is there a difference in value between undergraduate degrees for accredited public 4-year universities in China and the United States between 2009–2019? and, 2) do relationships exist between or among the variables alumni, award, HiCi, N&S, PUB, and value from public 4-year universities in China and the United States between 2009–2019?

Key Findings

The key finding from RQ1 was there was a difference in value between undergraduate degrees for accredited public 4-year universities in China and the United States from 2009–2019. This was based on the two-population *t*-test *p* value which was less than 0.05. For RQ2 it was determined that relationships do exist between or among the variables alumni, award, HiCi, N&S, PUB, and value for public 4-year universities in China and the United States between 2009–2019 due to the variables. For the United States two key findings were since the alpha was 0.05, and the two *P*-values were USAW at 0.023 and USNS at 0.016 the null hypothesis was rejected. For China, a key finding

was since the alpha was 0.05, and the P-value was CHI at 0.02 the null hypothesis was rejected. Transitioning into Chapter 5 the following elements will be provided: introduction, interpretation of finding, limitation of the study, recommendations, implications, and a conclusion.

Chapter 5: Summary, Conclusion, and Recommendations

Introduction

The purpose of this study was to define the value of an undergraduate education, and create an international value standard through a quantitative comparative analysis of China and the United States. This study had a three-phased approach: i) the creation of an international value standard, ii) the calculation of a two-population *t*-test between the United States and China's HEIs, and iii) the calculation of a multiple regression to determine why there was a difference in value. This study was needed because there was no international value standard to measure and quantify HEIs value. Therefore, I undertook that effort in this research using the two countries: the United States and China using the years of 2009 to 2019. The first key finding was the acceptance of the international value standard. The second key finding from this research based on RQ1 was the difference in value between the United States and China's HEIs. A third key finding from this research was based on RQ2 where relationships existed in a positive and significant manner through the United States multiple regression model between, USAW and USV. The fourth key finding was the variables USNS and USV had a negative and significant relationship. The fifth key finding from this research was based on RQ2 where the relationships existed in a positive and significant manner through the China multiple regression model between CHI and CV.

Research Question 1

Interpretation of Finding International Value Standard

One way that the key findings of the development of the international value standard extend knowledge in the field of public policy and administration, was the global perspective of HEIs and the measure of their value. This research also confirmed the importance and need for HEIs across the international community. More specifically, the authors Amir, Auzair, Maelah, and Ahmad (2016) used the value-based pricing approach through a specific value factor with customer value maps. The extension of my key findings can add to the literature that there was not an international value standard where research can extend its perspective to the value factors. Likewise, Daromes (2015) used the belief system theory perspective, assessing internal operations for the institutional system and its internal operations elements such as its standards, procedures, and plans. The extension of my key findings can add to the literature by providing an international value standard perspective and allow Daromes (2015) to revisit.

Interpretation of Finding Two-Population *t*-Test

A key finding that there is a difference in value between the United States and China's HEIs extended knowledge in the field of public policy and administration through the comparison of HEIs of China and the United States. This also established a broader framework of policies and administration to improve HEIs across the international community. Chen and Yeager (2011) highlighted this concept through teacher evaluations and where they stemmed from: China's teacher evaluations stemming from the Ministry of Education while the United States coming from the institution itself

mainly (individual State Departments of Education and the Federal-level Department of Education). The extension of my key finding may add to the literature different insights of how there is difference in value between the United States and China's HEIs and allow Chen and Yeager (2011) to reassess comparing teacher evaluations in this perspective. Zha (2011) focused on the massification of higher education comparing the United States and China. The public and private sector in China were labeled *quasi-markets* meaning the State has control; however, funding came from the family when it came to higher education. The extension of my key finding can add to the literature where there is a difference in value between the United States and China's HEIs, and allow Zha (2011) to revisit massification, funding, and quasi-funding for the United States and China's HEIs.

Research Question 2

Interpretation of Finding Multiple Regression

The third and fourth key finding included the relationships that exist in a positive and significant manner through the United States multiple regression model between USAW (United States award) and USV (United States value); and negative and significant manner through USNS (United States Number of papers published in nature and science) and USV (United States value), and fifth key finding, relationships exist in a positive and significant manner through the China multiple regression model between CHI (China's Number of highly cited researchers) and CV (China value) that extend knowledge in the field of public policy and administration within the same body of literature. For example, Turner and Lindsteadt (2012) asserted that networking was key when it came to alumni and value. The extension of my key findings, USAW and USV

and CHI and CV were positive and significant and can add to the literature more foundational quantitative knowledge as stated by Turner and Lindsteadt (2012).

Conceptual Framework Analysis

I used a conceptual framework for this research study whereby I married three theories: i) The Value Transaction Theory (VTT), ii) The Transaction Utility Theory (TUT), and iii) Decision Rules. The VTT described statistical thermodynamics and information theory. Information theory used the concept of disorder and this first law was later used in commercial markets and industries. The summary of the law was that free-value was a value calculated with less significant information, while true-value is calculated with all information. The VTT was relevant to undergraduate education for many reasons. The first notion of conserved quantity indicated that the transaction of undergraduate education is being protected from the true value. Therefore, findings indicated through the first research question, “to what extent if any is there a difference in value between undergraduate degrees for accredited public 4-year universities in China and the United States between 2009–2019,” that there is a difference in value. Extending this finding to VTT, free value would apply to HEIs rather than true value as it obtains less information when looking through the lens of there being a difference in value between the United States and China’s HEIs. This was specifically for the variables: employment, earnings, and costs, in the China and United States systems. Likewise, the VTT posits a higher likelihood of a transactional disorder for higher education where free value is only achievable if it is released. The VTT was vital for the overall comparison of the United States and China, for the same foundational argument of the transactions of

HEIs and their true value. The same goes for the transaction disorder for the United States and China's HEIs, where the free value will only be achievable when released. Findings indicated through the second research question, “do relationships exist between or among the variables alumni, award, HiCi, N&S, PUB, and value from public 4-year universities in China and the U.S between 2009–2019,” there was a relationship among the variables. Extending these findings to VTT, entropy—also known as a transactional disorder—occurs within HEIs where free value is only achievable if it is released. The entropy disorder where free value is achieved and released can be highlighted through the key findings the United States multiple regression model that USAW and USV relationships exist in a positive and significant manner and the China multiple regression model that CHI and CV exist in a positive and significant manner.

The TUT described the following: i) the market price which is the price of the good/product that is sold, and ii) reservation price which is the lowest point at which the good/product can be negotiated (Thaler, 1983). Findings indicated through the first research question “to what extent if any is there a difference in value between undergraduate degrees for accredited public 4-year universities in China and the United States between 2009–2019”; there is a difference in value. Extending this finding to TUT the market price and reservation price would apply to the United States and China’s HEIs; specifically, the variables employment, earnings, and cost. Findings indicated through the second research question, “do relationships exist between or among the variables alumni, award, HiCi, N&S, PUB, and value from public 4–year universities in China and the United States between 2009–2019,” that there was a relationship amongst

the variables. Extending these findings through the TUT, the market price and reservation price can be highlighted through the key findings the United States multiple regression model that USAW, and USV relationships existed in a positive and significant manner and the China multiple regression model that CHI and CV existed in a positive and significant manner.

The decision rules were the last component of the conceptual framework for this research study. Ginsberg's et al. (2018) cost utility analysis, and rules were based on the immunizations against respiratory syncytial virus. More specifically, based on the data available, the rules established *very cost effective* and *cost effective* if their variable was less than the per capita gross domestic product (GDP). Findings indicated through the first research question to what extent if any is there a difference in value between undergraduate degrees for accredited public 4-year universities in China and the United States between 2009–2019; there was a difference in value. Extending this finding to decision rules were based upon the fact that there was a difference in value. This was specifically for the variables: employment, earnings, and cost, in the China and United States. cases. Findings indicated through the second research question, “do relationships exist between or among the variables alumni, award, HiCi, N&S, PUB, and value from public 4-year universities in China and the U.S between 2009–2019,” there were relationships amongst the variables. Extending these findings first into the multiple regression model USAW and USV relationships exist in a positive and significant manner, the referenced independent variables would be assigned a higher score than the other independent variables when it can to decision rules. As for the China multiple

regression model, CHI and CV relationships existed in a positive and significant manner and therefore, the referenced independent variables would be assigned a higher score than the other independent variables when it can to decision rules as well.

The referenced interpretations did not exceeded the data as it was solely based on the secondary open-sourced data from this study. The referenced interpretations have not exceeded the findings as it was solely based on the findings referenced in Chapter 4's Analysis. Finally, the referenced interpretations have not exceeded the scope because the defined scope was all 4-year public higher education institutions in the United States and China from 2009 through 2019.

Limitations of Study

The first limitation of this study was that all sources were quantitative data from secondary open-data sources. I recognized that the secondary data was mined from different and various sources, some which included two very contrasting government sources. However, due to the data being secondary, all data had already been vetted and deemed reliable and valid. After collecting and analyzing all data, I still concur this option was the best for this study. The second limitation I addressed was the lack of a primary dataset for the HEI international value standard; and upon creating one, I still concur that utility divided by cost over the decade of 2009 through 2019 was still the best option for this study in defining value.

The validity of this research was divided into three parts: i) internal, ii) external, and iii) construct. For this research study, possible internal validity addressed maturation and selection. Upon completion of collecting and analyzing all secondary data sets I

determined that: i) maturation was addressed already due to data being secondary and within the timeframe context of 2009–2019, and ii) selection again was addressed due to all being secondary in nature. Possible external validity threats I addressed in this study was setting. In other words, the possibility of if this study can be generalized in another setting or situation. The short answer was “yes,” as the key was comparable components and creation of the international value indicator. Finally, possible construct validity threats addressed in this study was the two-population *t*-test measurement and multiple regression. Both statistical tests are popularly used and recommended, worked well with this study, and are recommended as the tests for any further research grounded in this specific area.

Reliability

With regards to reliability, this research has the ability to maintain repeatability and consistency in two forms: i) if there were an effort expanded for a larger time frame (outside the 2009–2019), and/or ii) there were an effort expanded for more countries aside from China and the United States. The repeatability and consistency effort transcends as the data came from secondary sources and an international value standard that can now be used for further research.

Policy Recommendations

The following policy recommendations are grounded and based on the study’s literature review. The policy recommendations were divided in to three sections which include: i) International Policy Recommendations, ii) United States Policy Recommendations, and iii) China Policy Recommendation.

International Policy Recommendation

As previously mentioned, the United Nations recognizes the need for HEIs and accreditation holistically; but did not have a global formula, and/or evaluation for HEIs to become accredited. Likewise, there were no periodic check-ins on the HEIs accreditation status (Education 2030: Incheon Declaration, 2016). Therefore, the first recommendation is for the United Nations, who represents the global international community to: i) endorse the international value standard, and ii) promote all accredited HEIs across the globe to use the international value standard through their Sustainable Goal Number Four which addresses education, in general.

The second policy recommendation from the international perspective for this study is to expand the international value indicator to include more than the two countries (United States and China.) Previously discussed in this research, were the five major countries of the UNSC. They included China, France, the Russian Federation, the United Kingdom, and the United States of America. Therefore, I would suggest adding France, Russia, and the UK, to the international value standard; and then pivot to adding the 10 non-permanent member states of the UNSC.

United States Policy Recommendations

The United States has a Democratic Republic form of government. To that point, the United States first looks to the United States Constitution as the foundation before crafting or revising federal laws, precedent, and policy. In the context of education and higher education, the founding fathers did not address this very topic within the United States Constitution specifically. In the current period, the Department of Education

federally regulates higher education institutions to a limited extent. The first United States policy recommendation would be to restructure a portion of the Higher Education Act. In this capacity, the recommendation would be to update the language in the HEA recognizing and implementing: i) the international value standard for all accredited HEIs in the United States, ii) recognizing that there is a difference in value of HEIs, and finally iii) recognizing why there is a difference in value in HEIs. With this policy recommendation of updating the HEA, the Department of Education will be able to take action towards colleges and universities and reallocate and reappropriate budgets in a more strategic and purposeful manner; especially when it comes to HEIs in the United States when grants or formula grants are applied and awarded.

A second United States policy recommendation would be for the United States Department of Education to accomplish the following: i) to write the rules and regulations for accreditation for all HEIs in the United States that should be phased in and used, ii) be responsible for the accreditation of all HEIs in the United States and finally, iii) provide oversight afterwards of HEIs to make sure they are keeping up with accreditation standards.

As previously determined by Dumitru and Feararu (2018), the consensus for HEIs in terms of national security are that: i) HEIs are *already* categorized as a political institutions, and ii) stability is obtained when a period of instability levels out. An additional United States policy recommendation for HEIs and students based on the logic of Dumitru and Deararu (2018) is for the Department of Homeland Security to update the Intelligence Reform and Terrorism Prevention Act of 2004 to include: i) how the value of

a degree is a vested national security matter for the nation, and ii) how to educate and recruit students throughout United States HEIs based on the value of the degree component.

As previously noted, the population sample was based on the timeframe of 2009–2019. Likewise, the study was based on 4-year public universities in the United States. With regards to the United States, the policy recommendation for this study is: i) to open up the timeframe spread, and/or ii) to use private universities as well as graduate and technical colleges for the “value” analysis.

China Policy Recommendations

China has a communist form of government and a constitution titled the “Constitution of the People’s Republic of China.” This is used as the foundational principle for the country. In the context of education and higher education, Article 19 of China’s current constitution cites, “The State undertakes the development of socialist education and works to raise the scientific and cultural level of the whole nation” (Constitution of the Peoples Republic of China, n.d.). The first China policy recommendation would be to update The Higher Education Law of the People's Republic of China under The Ministry of Education of the People's Republic of China which was effective on January 1, 1999 (Higher Education Law of the People's Republic of China, n.d). The policy recommendation is to update the language in "The Higher Education Law of the People's Republic of China" recognizing and implementing the following: i) the international value standard for all accredited HEIs in China, ii) recognizing that there is a difference in value of HEIs, and finally iii) recognizing why there is a difference in

value in HEIs. With this policy recommendation of updating “The Higher Education Law of the People’s Republic of China” the Ministry of Education will be able to take action towards colleges and universities and reallocate and reappropriate budgets in a more strategic and purposeful manner when it comes to HEIs in China.

A second China policy recommendation would be for the Chinese Ministry of Education to accomplish the following: i) to write the rules and regulations for accreditation for all Chinese HEIs which should then be phased in and used, ii) be responsible for the accreditation of all HEIs in China, and finally iii) provide oversight afterwards of HEIs to make sure they are keeping up with accreditation standards.

As previously determined, the consensus for HEIs and the students in terms of national security are that: i) HEIs are considered political institutions based on China’s communist government politics, and ii) individuals within China are dealt with through the blended market economy. An additional China policy recommendation is for the Central Committee of the Communist Party of China to update the Regulations on the Education and Management of Party Members of the Communist Party of China to include: i) how the value of a degree is a vested national security matter for the nation, and ii) how to educate and recruit students throughout China based on the value of the degree component.

Finally, as previously noted, the population sample was based on the time frame of 2009–2019. Likewise, the study was based on 4-year public universities in China. With regards to China., the policy recommendation for this study is: i) to open up the

time frame spread, and/or ii) to use private universities as well as graduate and technical colleges.

Implications

The first potential social impact is to begin the active implementation of the international value standard for all HEIs across the globe. The second potential social impact is to acknowledge there is a difference in value for the United States and China's HEIs. Finally, the third potential social impact is to acknowledge why there is a difference in value of HEIs.

The implementation of the international value standard impact on local communities across the United States (e.g. in large cities such as New York City, Los Angeles, Dallas, and small suburban and rural areas across the United States) is to have college-bound students of all age groups, also known as the consumers, who are actively looking to obtain their Bachelors from a 4-year public university to understand quantitatively what their potential_degree is valued. Likewise, the implementation of the international value standard along with using the two-population t-test will bring impact to the local regions throughout China (e.g. Beijing, Hubei and Guangxi) because it will show if there are equalities or inequalities when it comes to "value" of a prospective HEI from the comparative perspective of the United States. Again, Chinese students and parents will have a better understanding of this with quantitative data and be able to make more informed decisions for their university of choice.

Social impact on the Universities (the providers) and stakeholders (high dollar donors, alumni, and state actors) lie with the data on the five variables: alumni, award,

HiCi, N&S, and PUB, as this data provides the answer of why there is a difference in value. From this, these key players will be able to pivot university policy and provide more (or less) of the variables for competition of their consumers.

The implications for positive social change do not exceed the study boundaries because the effort was to measure the value of a higher education. Therefore, assuming the measurement of the value of higher education is correct (using the international value standard where utility is divided by cost) the study found there is a difference in value of a higher education. The multiple regression test took the five variables of alumni, award, HiCi, N&S and PUB highlighting why there was a difference when it came to China and the United States HEIs. Therefore, the above referenced implications for social change are tangible implications that do not exceed this study's parameters and boundaries.

Methodological, Theoretical, and Empirical Implication.

The methods chosen was a quantitative comparative analysis using a two-population *t*-test and multiple regression. After analysis, I confirm that the choice made was still the appropriate and best-fit given the study's topic and constraints in the modern world. The comparative element allowed for the foundation of the international value standard. Additionally, the variables for the two-population *t*-test of utility and cost and multiple regression: alumni, award, HiCi, N&S, and PUB were best fit. The theoretical implication chosen for this study, were grounded in a conceptual framework which laid the foundation for the measurement to quantify value. Again, as previously stated, the conceptual framework was correctly chosen for the international value standard. Finally, the empirical framework that was provided was appropriate for this research study to

quantify the value of HEIs with a quantitative measurement. As appropriate, it can be suggested that for further research, a mixed-methods framework may be appropriate to quantify value in a more tailored manner.

Social Change Recommendations for Practice

This research study is recommended for further research in some specific areas. The first positive social change recommendation for practice is to have active implementation of the international value standard beginning with all United States and China HEIs. Plainly, active implementation of the international value standard would mean all accreditation of HEIs must be tied to federal and state funding for the United States, and government funding for China, equitably. The second positive social change recommendation for practice of HEIs is to have the value measurement comparison use the t-test which answers “why” there is a difference in value of HEIs. The third positive social change recommendation for practice is to have the value measurement use the multiple variable regression when assessing the five variables of alumni, award, HiCi, N&S, and PUB, underscoring why there is a difference in value. The key findings determined that relationships exist in a positive and significant manner through the United States Multiple Regression Model between USAW and USV, and negative and significant manner through USNS and USV; while a relationship exists in a positive and significant manner through the China Multiple Regression Model between CHI and CV. Social Change policy in this capacity must keep an open mind going forward where these variables are the foundational work for researchers to build upon for measurements to include an international value standard of all HEIs in every country across the globe.

Therefore, since in the United States there were four variables that were significant and positive, and in the China case there were two variables that were significant and positive, it is the recommendation to not specifically focus on one variable going forward when building out the international value standard for all HEIs in every country across the globe, but to keep an open mind and flexibility toward measure identification.

Conclusion

Higher Education Institutions across the globe use and need a measure of “value;” however, the means of assessing is different. This study addressed HEIs and the gap of an international value standard. It was determined in this study to create a quantitative comparative analysis between the United States and China to assess value for 4-year public HEIs from 2009–2019. This study trailblazed an international value indicator for HEIs. It looked if there was a difference in value of HEIs with a two-population t-test. And finally, it sought out why there was a difference in value of HEIs with a multiple variable regression. This research study found five key findings: i) validation of the international value standard, ii) findings that there was a difference in value between the United States and China’s HEIs, iii) relationships exist in a positive and significant manner through the United States Multiple Regression Model between USAW and USV, iv) negative and significant manner through USNS and USV and, v) relationships exist in a positive and significant manner through the China Multiple Regression model between CHI and CV.

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8/9/19, 8:07 AM



Alexandra Allman

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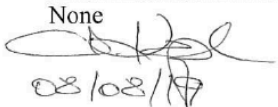
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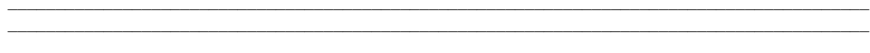
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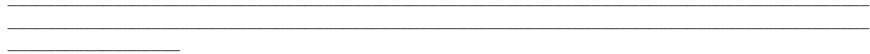


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Questions?

Appendix B: Research Questions and Hypotheses

Research Questions	Null Hypotheses	Alternative Hypotheses
1. To what extent if any is there a difference in value between undergraduate degrees for accredited public 4- year universities in China and the U.S. between 2009-2019?	H_0 : The difference in value between undergraduate degrees for accredited public universities in China and the U.S. are equal.	H_1 : The difference in value between undergraduate degrees for accredited public universities in China and the U.S. are unequal.
2. Do relationships exists between or among the variables Alumni, Award, HiCi, N&S, PUB and value from public 4-year universities in China and the U.S between 2009-2019?		

Appendix C: China and United States Comparable

Topics	China	U.S.
Governance	MoE	DoE
Funding	“Government Appropriation for Education” refers to the public budgetary fund for education, taxes and fees collected by governments at all levels that are used for education purpose, enterprise appropriation for enterprise-run schools, income from school-run enterprises and social services that are used for education purpose and other national appropriations for education.”	Appropriation for education begin in House of Rep and then passed in Senate.
Economy	RMB	USD
Span of Control	2,246 HEIs	4,724 HEIs
Is the BA a Social Norm	Yes	Yes

Note. China Statistical Yearbook. (2014). Budget Process in the US Department of Education. (n.d).

Appendix D: HEI Standard Comparison Questions

HEI Comparison Questions

- 1) Changes in the ideologies of the state.
- 2) Changes in the mechanisms of government and the salience of central government.
- 3) Policy formation and the place of government agencies, educational institutions, elites, interest groups, and actor networks of various kinds.
- 4) The nature of the reforms created by government.
- 5) The impacts of the reforms in terms of the academic profession, epistemic identities and working practices of academics in a range of disciplines, and in a range of institutions in the three countries.

Note: Custer (2018).

Appendix E: Earnings

Table 1. Variable sources and descriptive statistics

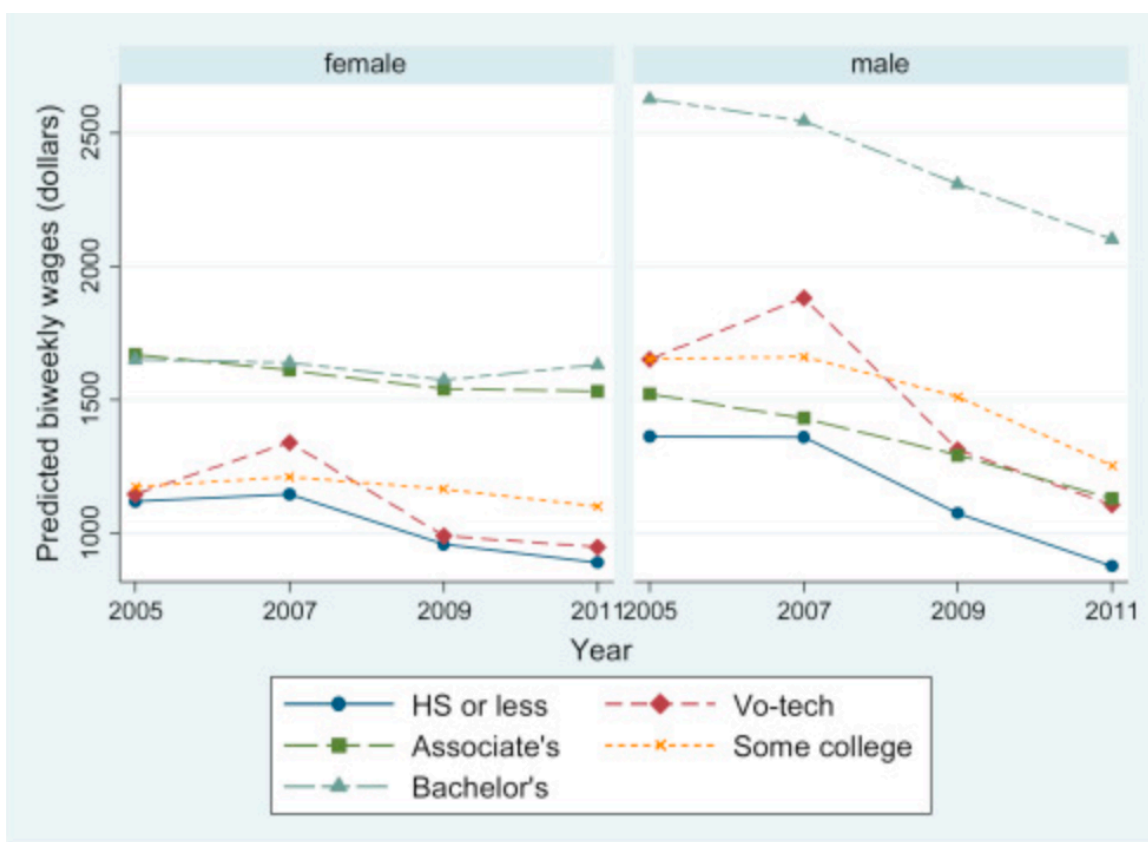
Description	Source	Period 1				Period 2						
		year(s)	Mean	SD	Minimum	Maximum	year(s)	Mean	SD	Minimum	Maximum	
<i>Dependent variable</i>												
EARNCH	Adjusted change in average earnings	BEA, BLS	2001-07	-2.69	4.86	-19.33	23.86	2007-11	0.66	40.04	-16.80	20.31
EMPCH	Change in non-farm employment	BEA	2001-07	1.10	0.09	0.91	1.54	2007-11	0.97	0.04	0.84	1.18
GMPCH	Change in real gross metropolitan product per capita	BEA	2001-07	1.09	0.09	0.86	2.05	2007-11	0.96	0.07	0.75	1.36
BIRTH	Establishment births per thousand capita	SBA	2003-07	2.73	1.45	0.54	16.36	2008-09	1.94	0.73	0.39	7.81
BIRTHEMP	Employment in births per thousand capita	SBA	2003-07	21.67	11.63	2.53	116.00	2008-09	14.78	5.70	1.65	60.11
<i>Independent variable</i>												
UNIVRD	University research and development (R&D) expenditures (billions)	NSF	1996-2000	0.39	0.93	0.00	7.29	2002-06	0.55	1.29	0	10.37
UGSCI	Science and engineering share of undergraduate degrees	NCES	1996-2000	0.21	0.13	0	1	2002-06	0.20	0.13	0	1
PREBSCI	Science and engineering share of pre-bachelor's degrees	NCES	1996-2000	0.33	0.15	0	1	2002-06	0.36	0.15	0	0.89
PREDEG	Pre-bachelor's share of all degrees	NCES	1996-2000	0.48	0.28	0	1	2002-06	0.47	0.28	0	1
PATUNIV	University patents (hundreds)	USPTO	2000-01	0.12	0.36	0	4.10	2002-06	0.29	0.87	0	9.27
ADJMSA	MSAs within 60 miles	Census	-	10.96	6.68	1	29	Same as Period 1				
ADJSCI	Undergraduate and graduate science degrees within 60 miles (hundred thousands)	NCES	1996-2000	60.03	43.10	0	209.67	2002-06	66.14	47.38	0	241.29
ADJPREB	Pre-bachelor's degrees within 60 miles (hundred thousands)	NCES	1996-2000	126.18	88.15	1.13	497.90	2002-06	149.48	105.91	0.90	518.60
EMPL	Natural logarithm of non-farm employment	BEA	2001	11.98	1.05	9.69	15.05	2007	12.07	1.05	10.05	15.17
GMP	Gross metropolitan product per capita (ten thousands)	BEA	2001	3.42	0.94	1.56	7.92	2007	3.72	1.06	1.47	8.62
EARN	Average earnings as a percentage of the US figure	BEA, BLS	2001	99.59	15.59	70.71	205.31	2007	96.91	15.41	68.58	191.66
POPCH	Percentage change in population	Census	2001-07	1.04	1.14	-2.75	8.59	2007-11	0.96	0.81	-0.96	3.59
MFG	Manufacturing share of earnings	BEA	2000	0.18	0.10	0.02	0.59	2006	0.14	0.09	0.01	0.54
MFGCH ^a	Change in manufacturing share of earnings	BEA	2000-07	-0.04	0.03	-0.14	0.03	2006-11	-0.02	0.02	-0.12	0.05
BSERV ^a	Business services share of earnings	BEA	2000	0.05	0.03	0.01	0.21	2006	0.10	0.05	0.00	0.32
BSERVCH ^a	Change in business services share of earnings	BEA	2000-07	0.05	0.04	-0.04	0.27	2006-11	0.01	0.02	-0.11	0.09
PROP	Proprietor's share of earnings	BEA	2000	0.11	0.04	0.04	0.35	2006	0.12	0.04	0.02	0.30
PROPC	Change in proprietor's share of earnings	BEA	2000-07	-0.01	0.02	-0.08	0.06	2006-11	-0.01	0.02	-0.08	0.05
PATCOM	Commercial patents (thousands)	USPTO	2000-01	0.38	1.04	0.00	12.19	2002-06	0.96	2.80	0.00	34.79
COLLEGE	Percentage 25+ with a bachelor's degree or greater	Census	2007-11	0.26	0.08	0.12	0.58	Same as Period 1				
HIGHSCH	Percentage 25+ with a high-school but not a bachelor's degree	Census	2007-11	0.60	0.06	0.36	0.73	Same as Period 1				
HUBSM	Small airport hub (dummy)	BTS	2001	0.16	0.37	0	1	2007	0.17	0.37	0	1
HUBMED	Medium airport hub (dummy)	BTS	2001	0.08	0.26	0	1	2007	0.08	0.27	0	1
HUBLG	Large airport hub (dummy)	BTS	2001	0.06	0.24	0	1	2007	0.06	0.23	0	1
CRIME	Crime index	Places	2007	0.50	0.29	0	1	Same as Period 1				
HEALTH	Healthcare access index	Places	2007	0.50	0.29	0	1	Same as Period 1				
CLIMATE	Climate index	Places	2007	0.49	0.29	0	1	Same as Period 1				
REC	Recreation index	Places	2007	0.49	0.29	0	1	Same as Period 1				
NORTHEAST	Northeast Census Region (dummy)	Census	-	0.12	0.33	0	1	Same as Period 1				
MIDWEST	Midwest Census Region (dummy)	Census	-	0.25	0.44	0	1	Same as Period 1				
SOUTH	South Census Region (dummy)	Census	-	0.41	0.49	0	1	Same as Period 1				
WEST	West Census Region (dummy)	Census	-	0.21	0.41	0	1	Same as Period 1				

Notes: BEA = Bureau of Economic Analysis; BLS = Bureau of Labor Statistics; BTS = Bureau of Transportation Statistics; Census = US Census Bureau; MSA = Metropolitan Statistical Area; NCES = National Center for Education Statistics; Places = *Places Rated Almanac* (SAYAGEAU, 2007); SBA = Small Business Administration; and USPTO = US Patent and Trademark Office.

^aManufacturing share of earnings missing for seven MSAs in 2000 and six MSAs in 2006. Change in manufacturing share of earnings missing for ten MSAs from 2000 to 2007 and from 2006 to 2011. Business services share of earnings missing for six MSAs in 2000 and two MSAs in 2006. Change in business services share of earnings missing for seven MSAs from 2000 to 2007 and two MSAs from 2006 to 2011.

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Appendix F: Degrees and the Economy



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Appendix G: Family Income and Degrees

Table 5. Intergenerational Association in Family Income.

	Model 1	Model 2	Model 3	Model 4
Full Sample	0.410***			
	(0.017)			
Less than Bachelor's Degree		0.338***		
		(0.019)		
Bachelor's Degree		0.260***		
		(0.039)		
Less than Bachelor's Degree			0.338***	0.214***
			(0.019)	(0.020)
Non-selective Bachelor's Degree			0.340***	0.188**
			(0.063)	(0.063)
Less-selective Bachelor's Degree			0.135*	0.054
			(0.054)	(0.053)
Selective Bachelor's Degree			0.329**	0.231*
			(0.108)	(0.114)
Observations	3333	3333	3333	3333
R-squared	0.202	0.293	0.298	0.370

p<0.1 +; p < 0.05 *; p < 0.01 **; p < 0.001 ***.

Robust [standard errors](#) in parentheses; clustered by family in 1979. Coefficients represent the estimated association in status for level of education and institutional selectivity. Monetary values standardized to 2012 dollars. Family income averaged over the ages of 30–45 for the respondent. Parental family income measured when respondent is between ages of 14 and 18 and living in the parents' home. Respondents must have a minimum of three observations of income. Covariates in each model include age and age-squared for both respondent and respondent's parent. Additional covariates in Model 4 include sex, race, and AFQT score.

Note. Reprinted from “Mobility in the Middle: Bachelor’s Degree Selectivity and the Intergenerational Association in Status in the United States,” by Thompson, J., 2019, *Research in Social Stratification and Mobility*. 60. Reprinted with permission.

Appendix H: Multiple Regression United States Residual Output

United States Multiple Regression Residual Output

<i>Observation</i>	<i>Predicted USV</i>	<i>Residuals</i>
1	2.700464727	0.04953527
2	2.645890386	-0.0558904
3	2.550811591	0.00918841
4	2.595808903	-0.0158089
5	2.65654252	-0.0565425
6	2.621313523	0.05868648
7	2.812028604	-0.0020286
8	2.888554467	-0.0085545
9	3.028349398	0.0716506
10	3.139169336	-0.0591693
11	3.051066546	0.00893345

Note: Variable titles were used exclusively by the research approach.

Appendix I: Multiple Regression China Residual Output

China Multiple Regression Residual Output

<i>Observation</i>	<i>Predicted CV</i>	<i>Residuals</i>
1	3.05870549	-0.4787055
2	2.70430832	0.16569168
3	3.99627999	-0.71628
4	3.91805839	-0.1880584
5	3.82531811	0.39468189
6	4.63919234	-0.0191923
7	4.13899402	0.77100598
8	5.5624122	-0.3024122
9	5.95313348	-0.4431335
10	5.60040143	0.13959857
11	5.23319623	0.67680377

Note: Variable titles were used exclusively by the research approach.