The Effects of International Mergers and Acquisitions on Innovative Financial Performance for the Higher Education Industry

Duane Frederick

Karina Kasztelnik[1]
Colorado State University
Global Campus
College of Business

Abstract

Research indicates that 45% to 75% of mergers throughout all industrial sectors fail. The literature indicates increasing rates for higher education institution (HEIs) mergers. Researchers do not share common definitions of success for HEI mergers. One common and generally accepted definition for HEI success does exist through world class university ranking organizations lists of top HEIs. This study utilized WCU ranking criteria and found that HEIs are ranked based upon research strength, teaching quality, and global outlook to determine HEI rankings. This study adapted representative metrics used by these ranking organizations which served as the DVs in this study. The study adopted the Event Study theoretical framework to serve as the lens to evaluate the data and utilized a quantitative methodology with a causal-comparative research design. Data was obtained from the IPEDS database. The study utilized time as the within-subjects IV represented by Period 1 and Period 2 measures beginning the year of merger and 5 years subsequent to the merger. The between-subjects IV was merger status. The study sample included 80 HEIs which merged between 1988 - 2013 and 80 matching pair non-merging HEIs. The study used a two-way mixed design ANOVA to answer the following three research questions: "Are there interaction effects between time and merger status upon the DVs of revenues, fall enrollment rates, and nonresident alien rates?" The study found no statistically significant main effects between time and merger status upon revenues and nonresident alien rates and a statistically significant effect upon fall enrollment rates.

Keywords: Merger, Acquisitions, Higher Education Institutions, Metrics, Event Study, Revenues, Fall Enrollment Rates, Nonresident Alien Rates, Metric Improvement.

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[1] Corresponding Author: karinakasztelnik@yahoo.com

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It was not known if or to what extent, if any, there were interaction effects between time and merger status upon revenues, fall enrollment rates, and nonresident alien rates for Title IV HEIs located throughout the United States as identified by IPEDS.

The population for this study consisted of all HEIs, with title IV HEIs as the unit of observation. Then the study focuses on a target population of merged and non-merged Title IV HEIs located throughout the United States. The sample consisted of 80 post merger Title IV HEIs located in the United States that merged during the AY 1988/1989 – 2013/2014 and 80 matched-pair non-merging Title IV HEIs chosen for similar revenues, fall enrollment rates, degree granting programs, and Title IV status during the same AY the M&A event occurred. Matching-pair studies increase confidence for the reader by removing some variation between the M&A HEI and the non-merging HEI (Shan et al., 2018).

Many researchers have studied M&A events for HEIs utilizing qualitative methodologies which typically study the effects on individuals, departments, and other stakeholders of the merging HEIs. For example, Boling et al. (2017) utilized a qualitative case study approach to research the merger of two institutions in the University System of Georgia. They found that the University of North Georgia merger created a unique competitive advantage for the newly merged university because of the unique complementary nature of the merging schools (Boling et al., 2017). These results provide a fair representation of the type of qualitative studies contained in the literature. The results are informative but not generalizable for other HEIs. In a review of the literature, Williams et al. (2017) stated that most evaluations of M&A events focus on qualitative aspects of individual initiatives or institutions.

This study used a quantitative methodology and a causal-comparative (ex post facto) pretest/posttest research design, which examined performance metric DVs and provided a quantifiable evaluation of interaction effects between time (the within-subjects IV, represented as a five-year pretest/posttest) and merger status (between-subjects IV) upon the specified DVs of revenues, fall enrollment rates, and nonresident alien rates during the AYs of 1988/1989 - 2013/2014 (McWilliams & Siegel, 1997). This study designated post-merger HEIs as the unit of analysis (Russell, 2017a). The population for this study consisted of all Title IV HEIs located in the United States. The target population consisted of post-merger Title IV HEIs which experienced an M&A event located in the United States during AYs 1988/1989- 2013/2014 and an equal number of matching pair, non-merging HEIs during the same time periods as the selected M&A HEIs.

The purpose of this quantitative, causal-comparative study was to examine if or to what extent there were interaction effects between time and merger status upon revenues, fall enrollment rates, and nonresident alien rates for Title IV HEIs located in the United States (Elbourn et al., 2017; Ober et al., 2018).

This study designates the following performance metrics as the study DVs: revenues, fall enrollment rates, and nonresident alien ratios and utilizes the following definitions for these terms:

The total of all revenues and other additions which represent the sum of all revenues and other additions to net assets (U.S. Department of Education, 2018). Income accruing to an HEI includes but is not restricted to patent licensing, contractual agreements for research with public or private companies, governmental grants given for research, student tuition, fees, governmental appropriations, endowments, and alumni donations, as well as additional sources of income (Abdul-Alim, 2017; Hope, 2017; OECD, 2017).

The total enrollment of students for credit are during the HEI's official fall reporting date or October 15 (U.S. Department of Education, 2018).

The number of nonresident aliens are who enroll in an HEI for credit during the official fall reporting date or October 15 (Delgado-Márquez et al., 2011; OECD, 2017). IPEDS defines nonresident aliens as people who maintain their residence in the United States only on a temporary basis and who do not possess the right to reside in the United States indefinitely (U.S. Department of Education, 2018).

These performance metrics encompass the DVs examined in this study, which were derived from the common performance metrics of HEIs used to determine international comparative rankings of HEIs by WCU ranking organizations (Andreescu et al., 2015; Cantwell & Taylor, 2013; Docampo et al., 2015; Ripoll-Soler, 2014). At the theoretical level, each of these DVs serve as indicators of quality in the following areas: teaching, research strength, and international outlook. WCU ranking organizations use these three HEI components to judge the overall quality of HEIs. Indicators of teaching quality consist of revenues, fall enrollment rates, and nonresident alien rates (OECD, 2017). Revenues represent the research and teaching strength of an HEI. Fall enrollment rates relate to the teaching strength and reputation of the HEI, and nonresident alien rates represent the international outlook of an HEI (OECD, 2017).

Theoretical Foundation and Literature Review

This theoretical framework languished until Fama, Fisher, Jensen, and Roll utilized the Event Study theoretical framework to examine stock splits in 1969 (Fama et al., 1969). That study discovered that an announcement of a stock split has a limited effect on stock prices (Fama et al., 1969). Fama et al. (1969) confirmed the efficiency of the stock market and proved that the stock market had built in the price effects of the stock split by the end of the split month. Fama et al. (1969) controlled for extraneous effects to improve the internal validity of their study, with the result that this study resurrected the Event Study theoretical framework (Rao & Sreejith, 2014).

Fama, Fisher, Jensen, and Roll's research study became a seminal source for the utilization of the Event Study theoretical framework (Rao & Sreejith, 2014). Rao and Sreejith (2014) in their review said that the inclusion of a control for extraneous effects to show the efficiency of the stock markets, elevated the Event Study theoretical framework to the primary choice of researchers for a statistical solution to ascertain the impact of exogenous or endogenous events on performance metrics (Rao & Sreejith, 2014). Researchers cited this study more than 750 times by 2005 and the Event Study theoretical framework became the theoretical framework of choice for a new age of accounting, finance, and economic research (Rao & Sreejith, 2014). Currently, researchers use the Event Study theoretical framework to analyze the impact of major events on security prices (Rao & Sreejith, 2014). Fama et al. (1969) showed that researchers could measure and analyze the effects of an event on various performance metrics of a business. Chortareas, G., Karanasos, M., and Noikokyris, E. (2019) used the Event Study theoretical framework to study the Bank of England Monetary Policy Committee's unexpected asset purchase announcement on the English equity markets. Russell (2017a) used the Event Study theoretical framework to analyze the effects of M&A activities on short-term HEI performance metrics and utilized this approach again a year later to analyze M&A effects on HEI market power (Russell, 2017a).

Today, researchers have applied the Event Study theoretical framework to examine the effects of a wide variety of events and their effects on performance metrics (Cazan, 2017). Studies of endogenous events have utilized the Event Study theoretical framework to examine how different events effect performance metrics, including stock prices and splits, corporate valuations, profits, market power, leadership changes, corporate divestiture from investments, and M&A initiatives (Rani et al., 2015). Researchers have also utilized the Event Study theoretical framework to study the effects of exogenous forces on performance metrics including 9/11, Brexit, and the enactment of major governmental policies (McWilliams & Siegel, 1997). Innate characteristics of the Event Study theoretical framework provide researchers with a versatile tool to analyze events and their effects on performance metrics.

Das et al. (1998) applied the Event Study theoretical approach to strategic alliances and their effects on firm valuation. These researchers desired to discover if an announcement of a strategic alliance resulted in valuation implications, and hypothesized that any abnormal returns attributable to alliance announcements would register as a positive return (Das et al., 1998). The Das et al. (1998) study utilized resource dependence theory which theorizes that firms enter alliances to obtain resources which they currently lack. That study selected a pair of firms announcing an alliance on a given date as their unit of analysis (Das et al., 1998). Das et al. (1998) selected the Event Study theoretical framework as their empirical methodology because of its extensive use in the financial sectors. The study found that abnormal returns registered as insignificantly positive (Das et al., 1998).

The Event Study theoretical framework lends itself to a causal-comparative (ex post facto) research design due to the impractical nature of creating exogenous events like M&A, 9/11, and Brexit, to study their effects on performance metrics. A true experimental design would utilize an intervention and a control in a forward-looking design, whereas the Event Study theoretical framework looks to past events as documented by naturally occurring historical data in place of the intervention and comparisons for extraneous factors (Trivedi & Srinivasan, 2016). Because researchers control for extraneous factors, they do not have to articulate precise market definitions (Russell, 2017a). For example, researchers who examine a DV like stock prices only need to know the merger value during the time of merger and the value of the same DV after the M&A event. The researcher does not need to know the specific owners or purchasers of the stock either before or after the event because the framework assumes that those entities with investment dollars will spend them in a way that obtains the most value (Russell, 2017a; Vita & Sacher, 2001). Therefore, because of the underlying assumptions, the Event Study framework allowed the study to focus on statistically significant aberrations in the performance metrics affected by specified events.

The Event Study theoretical framework requires the acceptance of three main underlying assumptions and a few research issues to effectively implement this theoretical framework (McWilliams & Siegel, 1997). The inference of event significance relies on accepting the following assumptions: markets are efficient, events are unanticipated, and there is an absence of confounding effects during the event window (McWilliams & Siegel, 1997). To maintain internal validity of a study, the researcher should address the following research design issues: adequate sample size, testing to identify and account for outliers, a justification for the length of the event window, controlling for extraneous factors, and explaining differences between conditions (McWilliams & Siegel, 1997). This study has met these conditions. Researchers should work to ensure that the parameters of the Event Study theoretical framework have adequately taken these issues into account to maintain internal validity of the study (McWilliams & Siegel, 1997).

The Event Study theoretical framework assumes that the DVs will change from year to year and seeks to discover if the interaction between time and event status upon the metric under study (the DV) differs significantly. The Event Study theoretical framework guided the primary research question to ask, "To what extent, if any, is there an interaction effect between time and merger status upon a specific performance metric?" This study reformatted the base research question into three specified DV research questions for examination in this research. These research questions sought to discover M&A effects on the specific DVs of revenues, fall enrollment rates, and nonresident alien rates. A review of the extant literature did not reveal the application of the Event Study theoretical framework to these HEI DVs. Since these research questions seek to discover the extent of interaction between time and merger status upon the specified DVs, the study adopted the Event Study theoretical framework.

This study considered utilizing other theoretical frameworks mentioned in the literature. One theoretical framework known as Neoliberalism, proposes a theory of economic practices that view HEIs transitioning from a classical mission orientation to a profit driven entrepreneurial orientation (Ngulube, 2018). Though many HEIs have transitioned to more entrepreneurial styles of management, the nature of 501(c)(3) non-profit charters discourages HEIs from turning to a pure profit focused objective. Non-profits do not have owners and their charters do not allow for the enrichment of individual persons at the non-profits expense. Non-profits do not pay dividends, profit-sharing, or have stock. Non-profit charters require the reinvestment of "profits" back into the institution. Therefore, because most of the research subjects in this study were public and private non-profit HEIs, this theoretical framework did not fit the fundamental research direction of the study and was rejected as a theoretical framework.

In a comprehensive review of the literature, Williams et al. (2017) stated that most evaluations of M&A events focus on individuals, initiatives, or single merged institutions. For example, Boling et al. (2017) utilized a qualitative case study to research the merger of two institutions in the University System of Georgia. The study wanted to identify the reasons for increased growth that the University of North Georgia (UNG) experienced after its merger (Boling et al., 2017). This qualitative, longitudinal study utilized an ethnographic design in which the researchers actively participated in the merger both as observers and as interested participants (Boling et al., 2017). The study found that strategic complementarity served to promote the success of the M&A activity and created a unique competitive advantage for the newly merged UNG (Boling et al., 2017). The ethnographic approach can introduce research bias into the study, especially when the researchers share a vested interest in the outcome of the M&A activity (Boling et al., 2017; Klamer et al., 2017). The researchers of this study indicated that the competitive advantage of this merger event remained dependent upon the unique circumstances involved in this merger, thus making the results non-generalizable (Boling et al., 2017).

Data Sources

This study utilized the Integrated Postsecondary Educational Data System as its source of data. The U.S. Department of Education, National Center for Education Statistics (NCES) maintains this archival database and annually updates data on every Title IV HEI in the United States. NCES collects the data from HEIs using an online self-reporting survey. The government enforces mandatory, accurate, and timely reporting of HEI data by the HEIs through statutory mechanisms.

Research Questions and Hypotheses

The study independent variables (IV) of merger status (the between-subjects factor) and time, expressed as Period 1 and Period 2 (the within-subjects factor) together with the DVs were chosen to examine the extent of any statistically significant interaction effect between time and merger status upon revenues, fall enrollment rates, and nonresident alien rates.

H_1: There is a statistically significant interaction effect between time and merger status upon revenue rates for Title IV HEIs.

H_2: There is a statistically significant interaction effect between time and merger status upon fall enrollment rates for Title IV HEIs.

H_3: There is a statistically significant interaction effect between time and merger status upon nonresident alien rates for Title IV HEIs.

Each research question and hypothesis sought to discover statistically significant interaction effects, if any, between time and merger status and revenues, fall enrollment rates, and nonresident alien rates for Title IV HEIs.

Results

To examine the interaction effects between time and merger status upon the individual DVs of revenue, fall enrollment rates, and nonresident alien rates, two-way mixed ANOVA analyses were conducted separately for each of the DVs using Intellectus Software. For research question one, RQ_1: To what extent, if any, is there an interaction effect between time and merger status upon revenue rates for Title IV HEIs? The study reports the following results.

Results for revenues and revenues plus 5 years

The study examined the results by using an alpha of 0.05. The analysis revealed no significance for the main effect of merger status, $F(1, 158) = 0.06$, $p = .813$. This indicated that the levels of merger status were similar. The analysis showed significance for the main effect of time upon revenues as reported in the initial year of measurement and 5 years after the initial measurement, $F(1, 158) = 19.61$, $p < .001$, indicating significant differences between the values of revenues and revenues plus 5 years. The analysis did not reveal any significance for the interaction effect between the time and merger status upon revenues, $F(1, 158) = 1.04$, $p = .310$. This indicates no significant differences exist between the values of revenues and revenues plus 5 years. This result indicates that for all combinations of time and merger status, the relationship between the outcome and the interaction of merger status is not significantly strengthened or modified.

The results of the analysis for research question RQ_1 shows no significant interaction effect between time and merger status upon revenues. The study failed to reject the null hypothesis H_10.

RQ_1: To what extent, if any, is there an interaction effect between time and merger status upon revenue rates for Title IV HEIs? No significant interaction effects exist between time and merger status upon revenues.

H_1: There is a statistically significant interaction effect between time and merger status upon revenue rates for Title IV HEIs. The study rejects the hypothesis. Table 1 presents the ANOVA results.

Table 1.

Mixed model ANOVA results for revenues and revenues plus 5 years.

Source	*df*	*SS*	*MS*	*F*	*p*	η_p^2
Between-Subjects						
Merger Status	1	23361060639004332.00	23361060639004332.00	0.06	.813	0.00
Residuals	158	66019833135661318144.00	417847045162413376.00			
Within-Subjects						
Time	1	393262478343403968.00	393262478343403968.00	19.61	< .001	0.11
Merger Status: Time	1	20801301777407120.00	20801301777407120.00	1.04	.310	0.01
Residuals	158	3167792734073495552.00	20049321101730984.00			

The study used Tukey comparisons of the mean contrasts based on an alpha of 0.05. The study used Tukey comparisons to test the differences in the estimated marginal means for every combination of the between-subject and within-subject effects.

Table 2.

The marginal means contrasts for each combination of within-subject variables for the mixed model ANOVA revenues and revenues plus 5 years.

Contrast	Difference	*SE*	*df*	*t*	*p*
Merger status|0					
Revenues – Revenues plus 5	-5.40×10^7	2.24×10^7	158	2.41	.017
Merger status|1					
Revenues – Revenues plus 5	-8.62×10^7	2.24×10^7	158	3.85	< .001

Note. Tukey Comparisons were used to test the differences in estimated marginal means.

Results for fall enrollment rates and fall enrollment rates plus 5 years

The study examined the results based on an alpha of 0.05. The analysis revealed no significance for the main effect of merger status, $F(1, 106) = 0.01$, $p = .912$. The analysis revealed significance for the main effect of time, $F(1, 106) = 4.78$, $p = .031$, indicating significant differences between the values of fall enrollment rates and fall enrollment rates plus 5 years. The study discovered significance regarding the interaction effect between time when interacting with merger status, $F(1, 106) = 4.48$, $p = .037$. This discovery indicates that for some combinations of time and merger status, the relationship between the outcome and the interaction of merger status is significantly strengthened and modified. Table 3 presents the ANOVA results.

The results of the analysis for research question RQ_2 shows that a significant interaction effect exists between time and merger status upon fall enrollment rates. The study accepts the hypothesis H_1 and rejected the null hypothesis H_10.

RQ_2: To what extent, if any, is there an interaction effect between time and merger status upon fall enrollment rates for Title IV HEIs? The study found a significant interaction effect that exists between time and merger status upon fall enrollment rates.

H_2: There is a statistically significant interaction effect between time and merger status upon fall enrollment rates for Title IV HEIs. The study accepts the hypothesis. Table 3 presents the ANOVA results.

Table 3.

Mixed model ANOVA results for fall enrollment rates and fall enrollment rates plus 5 years.

Source	*df*	*SS*	*MS*	*F*	*p*	η_p^2
Between-Subjects						
Merger status	1	2880801.04	2880801.04	0.01	.912	0.00
Residuals	106	24686918933.01	232895461.63			
Within-Subjects						
Time	1	10116180.67	10116180.67	4.78	.031	0.04
Merger status: Time	1	9474847.78	9474847.78	4.48	.037	0.04
Residuals	106	224380094.05	2116793.34			

The study used Tukey comparisons of the mean contrasts based on an alpha of 0.05. The study used Tukey comparisons to test the differences in the estimated marginal means for every combination of the between-subject and within-subject effects.

For the 1 category of merger status, fall enrollment rates were significantly less than fall enrollment rates plus 5 years, $t(106) = -3.04$, $p = .003$. The study found no significant differences for the 0 category of merger status. Table 4 presents the marginal means contrasts for the Mixed Model ANOVA.

Table 4.

The marginal means contrasts for each combination of time variables for the mixed model ANOVA for fall enrollment and fall enrollment plus 5 years.

Contrast	Difference	*SE*	*df*	*t*	*p*
Merger status|0					
Fall enrollment rates – Fall enrollment rates plus 5 years	-13.94	280.00	106	-0.05	.960
Merger Status|1					
Fall enrollment rates – Fall enrollment rates plus 5 years	-851.70	280.00	106	-3.04	.003

Note. Tukey Comparisons were used to test the differences in estimated marginal means.

Results nonresident alien rates and nonresident alien rates plus 5 years

The study examined the results by using an alpha of 0.05. The analysis revealed no significance for the main effect of merger status, $F(1, 158) = 0.00$, $p = .974$. This indicated that both the levels of merger status were similar. The analysis showed significance for the main effect of time, $F(1, 158) = 10.03$, $p = .002$, indicating significant differences between the values of nonresident alien rates and nonresident alien rates plus 5 years. The analysis did not discover any significance between the time and merger status, $F(1, 158) = 3.28$, $p = .072$. This result indicates that for all combinations of the time and merger status, the relationship between the outcome and the interaction of merger status was not significantly strengthened or modified.

The results of the analysis for research question RQ_3 shows that no significant interaction effect exists between time and merger status upon nonresident alien rates. The study failed to reject the null hypothesis H_30.

RQ_3: To what extent, if any, is there an interaction effect between time and merger status upon nonresident alien rates for Title IV HEIs? No significant interaction effects exist between time and merger status upon nonresident alien rates.

H_3: There is a statistically significant interaction effect between time and merger status upon nonresident alien rates for Title IV HEIs. The study rejects the hypothesis. Table 5 presents the ANOVA results.

Table 5.

Mixed model ANOVA results for nonresident alien rates and nonresident alien rates plus 5 years.

Source	*df*	*SS*	*MS*	*F*	*p*	η_p^2
Between-Subjects						
Merger status	1	1935.53	1935.53	0.00	.974	0.00
Residuals	158	282682275.09	1789128.32			
Within-Subjects						
Time	1	322643.50	322643.50	10.03	.002	0.06
Merger status: Time	1	105524.13	105524.13	3.28	.072	0.02
Residuals	158	5084870.87	32182.73			

The study used Tukey comparisons of the mean contrasts based on an alpha of 0.05. The study used Tukey comparisons to test the differences in the estimated marginal means for every combination of the between-subject and within-subject effects.

For the 1 category of merger status, the study results found significantly less nonresident alien rates than nonresident alien rates plus 5 years, $t(158) = -3.52$, $p < .001$. The study found no significant differences for the 0 category of merger status. Table 6 presents the marginal means contrasts for the mixed model ANOVA.

Table 6.

Marginal means contrasts for each combination of within-subject variables for the mixed model ANOVA for nonresident alien rates and nonresident alien rates plus 5 years.

Contrast	Difference	*SE*	*df*	*t*	*p*
Merger status|0					
Nonresident alien rates - Nonresident alien rates plus 5 years	-27.19	28.36	158	-0.96	.339
Merger status|1					
Nonresident alien rates - Nonresident alien rates plus 5 years	-99.83	28.36	158	-3.52	< .001

Note. Tukey Comparisons were used to test the differences in estimated marginal means.

Interaction effects between time and merger status upon DVs were studied for Title IV HEIs in the United States. Chapter 4 provides a description of the data analysis and reports the results which answer the research questions. Chapter 4 also shows analytical results which either rejected or failed to reject the null hypotheses. Data analysis included descriptive statistics, testing for outliers, the Levene Test, and three sets of two-way mixed ANOVA analyses. Descriptive analysis provided information about geographical location of the HEIs by state, and the type of control of the institution. Due to a wide variation in HEI revenues, fall enrollment rates, and nonresident alien rates the study found that the DVs possessed right skewed characteristics. The Levene Test was administered for each of the DVs and received non-significant results which indicated homoscedasticity. Although the DVs values were right skewed, the study determined that the distribution caused by a sample size of 160 would approximate a normal, homoscedastic data set.

The hypotheses were tested by two-way mixed ANOVA analysis for which the interaction effects of time and merger status upon each of the study DVs were determined in order to answer the research question for each DV. The study found significance for time upon revenues but the results of the analysis for research question RQ_1 shows that no significant interaction effect existed between time and merger status upon revenues. The study failed to reject the null hypothesis H_10.

The results of the analysis for research question RQ_2 showed a significant main effect of time and that significant interaction effects exist between time and merger status. The study accepted hypothesis H_1 and rejected the null hypothesis H_10. The same four univariate outliers were discovered for each DV. An analysis was conducted with the univariate outliers included in the samples and with these outliers excluded from the samples. The results were compared and the main effect results had the same outcome; therefore, a decision was made to keep the outliers in the study.

The results of the analysis for research question RQ_3 showed significance for the main effect of time, and the study did not find significant interaction effects between time and merger status upon study DVs. Therefore, the study failed to reject the null hypothesis H_30. Chapter 4 reported the data analysis steps and study results. The results show that interaction effects exist between time and merger status upon fall enrollment rates. Conversely, for revenues and nonresident alien rates the effects of merger status upon these DVs are insignificant.

The lack of causal determination is the main limitation of the causal – comparative research design. Because researchers using this design do not control or manipulate any study variables, the best that this type of research can determine is that IVs have or do not have significant effects upon the DVs. The research cannot report that fall enrollment rates increased because of HEI merger activity. But the research provides indicators of a significant effect between time and merger status upon fall enrollment rates. Chapter 5 summarizes the findings, conclusions, and implications of this research. The final chapter will also provide recommendations for further research and practice.

Summary of Findings and Discussion

Three separate two-way mixed ANOVAs were conducted. This was done to isolate the interaction effects between time and merger status upon each of the DVs. Therefore, three specific findings for the DVs of revenues, fall enrollment rates, and nonresident alien rates were presented. Results for revenues showed no statistically significant improvement as a result of merger status or lack of merger status. The analysis revealed a statistically significant effect upon revenues from the initial measurement of revenues and after a five-year time period had elapsed. Finally, the analysis revealed that interaction effects between time and merger status did not have a statistically significant effect upon revenues. This means that revenues for HEIs including both M&A HEIs and non-merging HEIs increased from 1988 to 2013 and that M&A activities did not contribute significantly to this increase. The reasons for this advance lie outside the scope of this study.

The results of the analysis for research question RQ_1 shows that no significant interaction effect exists between time and merger status upon revenues. Thus, the null hypothesis failed to be rejected. The confidence level of .95 provides robust support in answering the research question and failing to reject the null hypothesis.

The analysis results for revenues during the merger year and revenues during the merger year plus 5 years showed no effect for merger status. The analysis shows that revenues did not grow as a result of a completed HEI M&A initiative, but that revenues for all HEIs grew during the study time frame. In fact, the next finding shows that the within-subjects main effect did experience small effect ($\eta_\rho^2 = 0.11$), significant findings for M&A HEIs and non-merging HEIs. The study designated the within-subjects factor as 5 years of elapsed time from the time 1 measurement taken during the year of the M&A event and time 2 taken 5 years subsequent to the event. This finding showed that revenues grew for the HEIs in the sample by a statistically significant amount over the elapsed five-year time period. The analysis reported that revenues did not grow significantly more for M&A HEIs than for non-merging HEIs during the five-year time period. Therefore, the results of this study support Ahammad, et al. (2017) who argues that there exists no corroborative evidence that M&A activities provide a positive impact on the financial performance of the M&A HEI. The analysis has revealed that M&A activities have not contributed to increased significant historical growth for HEI revenues over the five-year time period. This means that M&A initiatives are not direct contributing factors in the improvement of the performance metric of revenues and supports the contention that more than 70% of M&A transactions were unsuccessful in creating value (Boling et al., 2017). This provides objective evidence supporting previous discussions in the literature that M&A activities do not positively impact specific performance metrics like revenues for HEIs in the short term (Ripoll-Soler, 2014).

Fall enrollment analysis resulted in a main effect merger status finding that did not have significance. In other words, being an M&A HEI compared to a non-merging HEI does not improve fall enrollment rates. The analysis did reveal that both non-merging and M&A HEIs experienced significant improvements in fall enrollment rates over the five-year time period. The analysis also revealed that the interaction effects between M&A HEIs over 5 years had a significantly greater increase in fall enrollment rates than did their non-merging counterparts. This supports what Bolbanabad et al. (2017) reported regarding the increasing volume of students and the efficiency of the HEI. This finding also supports those researchers who say that M&A experiences usually have mixed results for HEIs (Skodvin, 2014). For this study found statistically significant support to reject the null hypothesis for fall enrollment rates but failed to reject the null hypothesis for both revenues and nonresident alien rates. Russell (2017a) performed a quantitative study that found enrollment rates declined. However, that study only examined a range of years spanning 2001 – 2013, whereas this study examined M&A HEIs from 1988 – 2013. Williams et al. (2017) states that HEI M&A activities produced limited growth in enrollment, which supports the findings of this study. This presents an opportunity for further research exploring different time period length to clarify this disparity. While this analysis revealed a small effect size for improvement in fall enrollment rates, M&A activities combined with other initiatives to promote enrollment may significantly increase fall enrollment and should be explored.

Results for Nonresident Alien Rates. The study results revealed no significance for the main effect of merger status, $F(1, 158) = 0.00$, $p = .974$. In other words, completion of M&A activities does not innately impart favorable improvement of nonresident alien rates. The results of the study do indicate that nonresident alien rates did grow favorably over the five-year time period for both M&A HEIs and non-merging HEIs but that the interaction effect between time and merger status upon nonresident alien rates was not significant. This suggests that other factors caused growth in nonresident alien rates apart from M&A activity. Russell (2017a) reports that M&A activities increase tuition and fees by 7% for undergraduate students, which may provide insight as to the reason why nonresident alien rates did not grow as a result of M&A activity. That same study showed that the newly combined HEI experienced an increase in market power.

Many of the M&A HEIs examined in this study consisted of HEIs at the junior college level. A research project should consider an examination of M&A HEIs which only include STEM oriented HEIs at or above the four- year baccalaureate level to see if the effects of completing M&A activities for larger research universities provide significant interaction effects between time and mergers status upon nonresident alien rates. Williams et al. (2017) reports that M&A activities have not been effective in raising WCU rankings for the HEI and therefore, may not cause a significant boost in brand recognition in the international arena. The literature indicates that immediate benefits do not present themselves in the short term (Ripoll-Soler, 2014). Researchers have noted that globalization has become an increasing important factor in higher education and that there exists increasing competition for nonresident alien students. Therefore, the most effective means of improving nonresident alien rates seems to lie somewhere other than M&A initiatives.

The analysis has shown that there are positive interaction small effects ($\eta_{\rho}^2 = 0.04$) between time and merger status upon fall enrollment rates. Because of the small effects result, the study views the effect of merger status upon fall enrollment rates as negligible. The analysis has also shown that no statistically significant interaction effects occur between time and merger status upon revenues or nonresident alien rates. Therefore, this study concludes that HEI administrators of Title IV HEIs in the United States considering an M&A initiative solely to improve the DVs of revenues, fall enrollment rates, and nonresident alien rates in their HEI, should look for solutions outside of the M&A realm. The results indicate that administrators should implement M&A activities for HEIs for strategic rather than tactical reasons. In other words, the study results indicate that M&A initiatives do not seem to provide a short term (tactical) improvement for the study performance metrics. However, M&A initiatives can increase the overall capacity of the HEI in terms of resources to advance the HEI in the WCU rankings and in reputation. This in turn may increase HEI performance metrics over time.

Implications

This research contributed to the advancement of scientific knowledge in that it provided a quantitative study on the interaction effects between time and merger status upon the performance metrics which generalize across regional, state, and national landscapes. This section develops the theoretical, practical, and future implications for research. The theoretical discussion includes the increasing role of instituting M&A initiatives for HEIs by HEI administrators. Practical implications address how interested HEI stakeholders can use this study to analyze the historical interaction effects between merger status and time on performance metrics which they wish to improve. The future implications discussion includes how this research study provided what researchers in the field have asked for and how this increased knowledge of M&A longitudinal effects on performance metrics provides a framework for further study in this area.

Theoretical implications

Johnes (2014) stated that a rigorous analysis of merger effects using a control group of similar non-merging HEIs was desired in order to make objective comparisons. The Event Study theoretical framework provides for this objective comparison and was ideal for supporting a rigorous analysis of merger effects. Because, the Event Study theoretical approach allows the researcher to discover if an event interacts with a specific DV in a statistically significant way and assumes that the research will account for confounding factors. This study utilized non-merging comparison HEIs to account for confounding factors, thus meeting the expectation of the Event Study theoretical framework. This accounts for variations in measurements that might accrue to the M&A HEI due to exogenic shocks.

This research answers the request of researchers in the HEI M&A field, in that 80 M&A HEIs were matched with 80 non-merging HEIs chosen for similarities in revenues and fall enrollment rates. The study also chose to match the HEIs with the same type of comparison HEI i.e., public, private non-profit, and private for-profit entities so that all the HEIs had similar accounting systems for financial reporting purposes. The study used two other criteria for the matched pairs. These criteria consisted of Title IV status and degree granting status at or above the associate's level. This study also answered the call by Smeets et al. (2016) for merger and post-merger financial examination that would enable a link between merger conditions and subsequent profitability. This study utilized 80 M&A HEIs and 80 matching pair non-merging HEIs in the sample which exceeded the 54 samples required by G*Power analysis. This provided an added level of robustness to the study. The research results indicate that conducting M&A activity solely for the purposes of increasing revenues, fall enrollment rates, and nonresident alien rates may not provide an acceptable return on investment in the short term that justifies the expenditures of capital necessary to initiate M&A activities.

The Event Study model has consistently demonstrated the efficiency of markets to react to specific shocks to an entity. The study defined the M&A event as the shock to the units of observation in this study. The theoretical framework implies that the baseline metric values of the combining HEIs do not change in the short term. In the time 1 and time 2 range that this study examined, only fall enrollment rates showed a statistically significant improvement. Therefore, M&A activities undertaken to save two struggling HEIs which need to improve revenues in the short term, may not experience a satisfactory outcome due to the M&A activity. On the other hand, healthy HEIs initiating M&A activities to advance strategic objectives such as attaining WCU status or combining and adding to research facilities may prove to be effective. Though interesting, this branch of long-term strategic research exceeded the scope of this study. An investigation of WCU HEIs which examines if M&A activities helped propel them to WCU status, would fill a gap in M&A HEI literature.

M&A HEI administrators and researchers including Andreescu et al. (2015); Boling et al. (2017); Deschamps and Lee (2015); Pinhero et al. (2017); Tarba et al. (2017); and Williams et al. (2017) have all requested quantitative studies that will examine the interaction effects between time and merger status upon performance metrics which will also generalize across regional, state, and national landscapes. This study answered those requests by providing a quantitative study that shows that M&A initiatives do not generally result in short term, large effect, improvements to the metrics of revenues, fall enrollment rates, or nonresident alien rates.

Regarding the Event Study theoretical framework, this study further supports the framework in that it affirms that the HEI market is efficient and adapts quickly to HEI M&A activities and their effects on the DVs. The Event Study theoretical framework shows that in the HEI arena, revenues and nonresident alien ratios seem to experience the same rate of growth as the comparison matched pair non-merging HEIs over a five-year time period. And that M&A HEIs experienced a small favorable spike in fall enrollment rates over 5 years compared to their non-merging counterparts.

Practical implications

The implications of this research could cause HEIs to revisit the desirability of undertaking M&A activity because of the accompanying costs associated with said activity if there exist no clear beneficial short-term outcomes. HEI administrators could replicate this study for other performance metrics, which they seek to improve to align with their organizational goals. This allows the HEI administrators to generate quantifiable data regarding the general historical effects of M&A activities on specific metrics and apply extrapolate historical results to their HEI. If the results of their analysis show non-significance perhaps, they can allocate the funds they would have spent on M&A activities to other more productive avenues to achieve HEI objectives. If the results of the analysis show enough significance in metrics supporting M&A activity, then the HEI president has objective data to present to stakeholders which warrants the argument for initiating M&A activity.

Future implications

This study only touched on what researchers could study in this area. While the results of the analysis in this study lacked significance except for fall enrollment rates, researchers could replicate this study tailored to specific HEI performance metrics. This way HEI administrator would have access to objective data when conducting strategic planning for their HEIs. Also, researchers interested in achieving HEI WCU status could undertake a variant of this study to research which performance metrics provide the greatest boost to research strength, teaching quality, and international outlook. Upon attaining this data HEI administrator could focus on instituting M&A activity or improving programs to boost those metrics that will provide upward pressure for improvement in WCU rankings.

On a surface level the analysis results seem to advocate against M&A initiatives to advance the performance metrics of revenues, fall enrollment rates, and nonresident alien rates. The amount of time and capital required to complete an M&A initiative seems to outweigh any gains in metrics attributable to that effort. However, while this may hold true in the short-term, this does not consider longer term effects or improvement in economies of scale, or a combination of initiatives which include the M&A activity as part of an overall plan. Russell (2017a) has shown that M&A initiatives improve HEI market power and Boling et al. (2017) showed that if two merging HEIs have complementary natures than the effects of M&A activities may provide significant growth for that HEI. Furthermore, two HEIs which merge and gain the needed size to advance into the top 500 WCU ranks, may experience disproportionate interest by governments, industry, and matriculants in providing additional grants, contracts, tuition and other forms of remuneration. The literature suggests that HEIs which advance to a WCU level of success experience sudden gains in revenues, fall enrollment rates, and nonresident alien rates (Azziz et al., 2017; Azziz, 2019; Cai & Yang, 2015; Herbert & Rothwell, 2015). Researchers interested in this topic should examine the effects of achieving WCU status on different performance metrics to provide objective support for this theory.

Limitations and Future Work

The main strength of this research rested on the completeness and integrity of the IPEDS data. The data this study used has an entire division of statisticians in the U.S. Department of Education whose job is to ensure timely and accurate data which has been collected and analyzed using rigorous and proven statistical techniques. Another strength of this study lies in the number of observable HEIs identified in the sample and used in the analysis. Since the G*Power analysis showed that the study only needed 54 HEIs and this study provided 160 observable HEIs, a stronger analytical resulted because the minimum threshold was exceeded. Another strength of the study involved conditions that mitigated against tendencies toward research bias. The causal comparative design combined with ex-post facto ratio level data contained in IPEDS provided an environment where no IVs or DVs were manipulated. The lack of access to manipulate variables provides a bulwark against research bias.

A weakness of the study were the outliers which caused a problem with normality testing. The outlier HEIs are huge WCUs with vast resources and student bodies. Nevertheless, these HEIs were bona fide M&A HEIs and other than skewing analytical results, there remained no acceptable reason to exclude them from the study. Chapter 4 details how the study researcher mitigated the normality problem, however, in hindsight normalizing the DVs before analysis might have been an illuminating approach to take. For example, dividing revenues by the fall enrollment rates would have resulted in a revenues per student figure, which might have lessened the impact of outliers. Similar treatments of fall enrollment rates and nonresident rates may have provided different results. This weakness should be accounted for in future studies. Another weakness of the study involved the five-year time frame between observations. A ten-year gap between time 1 and time 2 would provide longer term views of interaction effects between merger status and time upon specific DVs. However, because of the IPEDS system time frame, such a study will have to collect data for another decade more to encompass the present field of M&A HEIs.

This study utilized IPEDS and appreciated the amount of information IPEDS lends to the HEI research area. For doctoral and graduate research, the opportunities to use IPEDS data seem unlimited, with the added benefit that IPEDS releases data as public domain data that can be utilized and published with no financial cost to the researcher. Furthermore, because IPEDS contains archival, institutional level data, studies which solely utilize this data should qualify as exempt studies for IRB purposes. In addition, because of the archival nature of this data, the research studies have minimal exposure to sample attrition. Also, because of the institutional nature of IPEDS data securing data for the purpose of protecting personal information maintains minimal risk of exposure. Finally, using ratio level statistical data drastically reduces skewed results caused by individual responders who may try to anticipate research desires. IPEDS has a help desk that will gladly answer questions about how to access the data in the database. This study highly recommends IPEDS and archival sources for quantitative studies.

This study only analyzed the three DVs of revenues, fall enrollment rates, and nonresident alien rates. There are hundreds of other ratio level data points in IPEDS that future researchers should study for interaction effects between time and merger status upon those DVs. Furthermore, this study utilized a five-year time frame for the time 1 and time 2 measurements. Researchers should replicate this study with a 10-year time 1 and time 2 to see if the extension of the time period results in different significant findings. A third area for further research should involve a quantitative assessment with a causal comparative design and a MANOVA analysis regarding the question, "Are M&A initiatives, in general, beneficial to improving overall HEI performance?" This would help to provide direction to HEI stakeholders as to the advisability of initiating M&A activities. A fourth area for future researchers to study regards the nature and source of revenue streams. Dividing revenues into research revenues and non-research revenues may provide insight on the effects of M&A activities in developing research strength. This study may address the growing importance of research and how M&A activities aid the research area. This research recommends that further quantitative studies be done using HEGIS, the precursor to IPEDS, for M&A HEI studies in the past. Further research using the Event Study methodology and IPEDS could also examine the effects of the 2008 recession on HEI performance metrics using the recession as the between subjects IV. One other area of research would be to limit the HEIs into those which primarily provide baccalaureate degrees or above to see if this effects nonresident alien rates findings.

This research recommends that HEI administrators and other stakeholders identify the specific metrics and goals that a proposed M&A initiative is expected to achieve. Then researchers should study the specific metrics that the HEI needs to improve to see if historical support for M&A activity justifies M&A activity to improve those metrics. Once HEI stakeholders possess this information they will have the ability to objectively consider return on investment and opportunity costs associated with the proposed M&A initiative during the strategic planning process.

Researchers in the M&A HEI field should add quantitative studies to their practice. In addition, researchers should look to further refine definitions of M&A HEI success through an examination of definitions of HEI success as propagated by the WCU ranking organizations. Perhaps a definition of M&A HEI success would involve the improvement of research strength, teaching strength, and global outlook, as well as other areas upon which researchers can reach consensus. Since governments, HEIs, parents, students, and other stakeholders accept the findings of the WCU ranking lists as defacto rankings of HEI success, using the metrics which WCU ranking organizations use to define M&A HEI success seems logical. This would give the M&A HEI research community a common basis for M&A success that receives wide acceptance.

Researchers should examine the effects that achieving WCU status has on an HEI. The research would need to define a benchmark definition of WCU status, such as achieving top 200 status on certain WCU ranking organization lists. It would then need to perform an ex-post facto examination of HEIs by year to determine the effects of WCU status upon the metrics of the HEI. Finally, a study which examines how and to what extent M&A activities contribute to achieving WCU status would also provide clarity in this area.

The basic question underlying this study remains. Should HEIs initiate M&A activities to become more viable? The answer to this is that it depends. The results of the study clearly show that M&A activities conducted for improving short-term gains in revenues and nonresident alien rates are not justified. Fall enrollment rates did show a statistically significant improvement between merger status and time. Russell (2017a) showed that M&A activities do result in decreased spending per student and increased student fees. This should lead to an expectation that revenues should have improved as well. But the results show that this is not the case. However, this significance in fall enrollment rates occurred for a small effect size and therefore, may not have much of an effect at all. The result for fall enrollment rates should probably not be used as the primary support for initiating M&A activities. What is not known are the interaction effects between time and merger status upon other performance metrics. Perhaps, research could examine some other more narrowly defined subsets of revenues, fall enrollment rates, and nonresident alien rates. HEI M&A activities may prove to be more valuable on a strategic level when pursuing objectives like establishing a larger research presence or advancing up the WCU ranks or expanding the reach of an HEI globally. Along with M&A activities, there exist many other alternatives and strategies that may prove even more effective in combination with M&A

initiatives. Further quantitative studies should examine how these alternate strategies improve the individual DVs of an HEI and their effects on HEI viability and advancement. The bottom line is that this study shows that M&A initiatives are not always the answer for overcoming the challenges facing HEIs today. The answers are somewhat amorphous and change for each unique situation. The M&A HEI field has much to do.

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