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Relationship Between Cohort Default Rates, 90/10 Rule Metrics, and Gross Revenue by Institution Size

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This is to certify that the doctoral study by

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has been found to be complete and satisfactory in all respects,
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Walden University
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Abstract

Private postsecondary education leaders are concerned with the value of education and the benefits students receive after graduation. Federal regulations dictate that private postsecondary education institutions will not qualify for Title IV funds if they do not meet minimum student outcome requirements, including cohort default rates and 90/10 rule ratios. Grounded in principal-agent theory, the purpose of this quantitative correlational study was to examine the predictive relationship between cohort default rates, 90/10 rule ratios, and gross revenue by institution size. Data were collected from publicly accessible repositories that provide data from U.S.-based postsecondary education institutions on 167 for-profit postsecondary Title IV institutions in California between 2016 and 2018. The results of the multiple linear regression analysis were not significant. A key recommendation from this study is for postsecondary education leaders to examine other potential factors that predict impacts on gross revenue. The implications for positive social change include the potential for higher education leaders to maintain federal Title IV funding, reduce poverty and crime, and reduce inequality.

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Dedication

I dedicate this doctoral study to my mom and all my loved ones who came before me. Your examples of sacrifice and diligence paved the way for me to reach my highest potential. I also dedicate this work to my siblings, cousins, and all my loved ones in my generation. Your accomplishments have inspired me to keep moving forward to reach my goals. Last, but certainly not least, I dedicate this study to my children, nephews, niece, and all my loved ones in the generation behind me. It is with you in mind that I chose to pursue a degree at the doctoral level. You have been an invaluable source of motivation. It is my hope that you set goals for yourself and accomplish them. I hope that I have made each of you proud.

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I thank God for the measure of faith He imparted into me to complete this journey. I thank Him for grace to keep going and for mercy in times when it looked hopeless, and I felt that I wanted to quit. Without holding on to my faith, this would have been impossible.

I would also like to express my gratitude to my former committee chair, Dr. Sean Stanley, for helping me to establish a solid foundation for my study. I also wish to acknowledge my committee chair, Dr. Wen-Wen Chien, for your patience and desire to see me succeed. Your insight has been invaluable throughout this journey. To my committee members, Dr. Gregory Uche and Dr. Dianne Dusick, thank you for your contributions and expertise in developing this study.

I want to extend a special thanks to my children, O. Jabari and Ashanté Booker for your unwavering support and encouragement. The two of you have been my biggest motivator throughout this process. I refused to give up because of you. Finally, I would like to thank my family and friends for your love, support, and encouragement.

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Section 1: Foundation of the Study

For-profit colleges and universities are proprietary businesses that provide postsecondary education primarily to prepare students to enter specific job markets. Institutional leaders base their measures of success on a set of governmental regulations, which affect these businesses' ability to generate revenue. Riegg Cellini and Koedel (2017) noted that 9% of all higher education students attend proprietary institutions as of 2014. Students who attend for-profit colleges and universities (FPCUs) default on their loans at a higher rate than students in other sectors (Gilpin & Stoddard, 2017). Approximately 22% of all student loans result in a default (Portis, 2020), and students who attend FPCUs make up 35% of all defaults (Riegg Cellini & Koedel, 2017). Proprietary colleges receive up to 90% of their revenues from taxpayer-financed federal student aid: Title IV funds (Hawkins Fountain, 2019).

Background of the Problem

For-profit colleges and universities have been under attack regarding the value of education and training provided compared to the benefits students receive after paying their money and attending these institutions. It is unclear whether students receive positive returns on their educational investment to secure comparable jobs (Riegg Cellini & Turner, 2019). Attempts to regulate the proprietary postsecondary education business sector date to 1992 amendments to the Higher Education Act (HEA; Riegg Cellini & Turner, 2019). Federal legislators seek to address these concerns with regulations. For-profit colleges and universities will no longer qualify for Title IV funds if they do not meet minimum cohort default rates and 90/10 metrics.

In 1989, cohort default rates regulations were established to combat growing concerns about poor student outcomes and federal student aid abuse. If more than 30% of federal student loan borrowers at an institution default on their loans for 3 consecutive years, the institution loses

its eligibility to receive Title IV funding (Riegg Cellini et al., 2020). The 90/10 rule was enacted in 1998, indicating that a for-profit postsecondary institution cannot receive more than 90% of its revenue from federal sources (Ward, 2019). Since 2015, 424 degree-granting colleges and universities have closed their doors (NCES, 2019). The U.S. Department of Education (U.S. DOE) imposed sanctions on two of the largest FPCU chains in the United States: Corinthian Colleges and ITT Technical Institute (Riegg Cellini et al., 2020). These sanctions resulted in hundreds of campus closures across the nation, impacting the education of thousands of students (Ward, 2019).

Problem Statement

Since 2010, more than one in six for-profit colleges have lost eligibility to participate in the federal financial-aid program (Marcus, 2019). The for-profit postsecondary education sector receives 70% of its total revenue through Title IV student aid (Ward, 2019). The general business problem was that leaders within the higher education industry could not determine the factors that predict gross revenue by institution size projections. The specific business problem was that some leaders in for-profit postsecondary schools have limited information and understanding about the predictive relationship between cohort default rates, 90/10 rule ratios, and gross revenue by institution size.

Purpose Statement

The purpose of this quantitative correlational study was to examine the predictive relationship between cohort default rates, 90/10 rule ratios, and gross revenue by institution size. The independent variables were cohort default rates and 90/10 rule ratios. The dependent variable was gross revenue by institution size. A ratio scale of measurement was appropriate to measure gross revenue by institution size for each institution included in the study. The

amount of gross revenue was measured for institutions that fall within designated enrollment size brackets. The sample size for this study was 167 for-profit postsecondary Title IV institutions in California. Secondary data came from publicly accessible repositories that provide data from U.S.-based postsecondary education institutions. Data for this study were available to the public through government repositories and updated every 3 years. Because cohort default rates were one of the variables assessed in this study, the dates used were limited to the availability of published cohort default rates. The current published 3-year cohort default rates spanned 2016–2018. Cohort default rates for 2017 were published in September 2020 (U.S. DOE, 2020). Therefore, I focused on data from 2016 through 2018. The sources of data included the National Center for Education Statistics (NCES), the Integrated Postsecondary Education Data System (IPEDS), and the National Student Loan Data System (NSLDS). The results of this study may contribute to social change by increasing access to higher education for nontraditional students, thus increasing the economic well-being of communities.

Nature of the Study

When conducting research, there are three standard methods: quantitative, qualitative, and mixed methods (Yin, 2018). I used the quantitative method for this study. Using a quantitative method allows a researcher to test and investigate deductively if a relationship exists between the variables (Bloomfield & Fisher, 2019). The quantitative method is useful when examining numerical data to explain larger populations' potential deductions (Yin, 2018). The quantitative approach was most appropriate for this study because the purpose of this study was to examine the predictive relationship between cohort default rates, 90/10 rule ratios, and gross revenue by institution size. Researchers conduct qualitative studies to understand the *what, how,* and *why* of a problem (Dahlberg & Dahlberg, 2019). A researcher conducting a mixed methods

study combines the quantitative and qualitative approaches (Nadarzynski et al., 2019). I was not gaining an understanding of a problem from the perspective of participants. Therefore, the qualitative and mixed methods approaches were not appropriate for this study.

Quantitative research designs may be categorized into four major groups: descriptive, correlational, quasi-experimental, and experimental (Bloomfield & Fisher, 2019). In this study, I used a correlational design. Researchers use correlational research to examine the predictive relationship between two or more variables and identify consistent, stable patterns within those variables (Moreno-Guerrero et al., 2021). When using a quasi-experimental or experimental design, the researcher seeks to control and manipulate the variables to determine cause and effect (Pattison et al., 2019). A correlational design was appropriate for my study because I was not manipulating variables but testing if a relationship exists between variables.

Research Question

What was the predictive relationship between cohort default rates, 90/10 rule ratios, and gross revenue by institution size?

Hypotheses

H_0: There is no statistically significant predictive relationship between cohort default rates, 90/10 rule ratios, and gross revenue by institution size.

H_1: There is a statistically significant predictive relationship between cohort default rates, 90/10 rule ratios, and gross revenue by institution size.

Theoretical Framework

I used the principal-agent theory (PAT) as a theoretical lens for this study. Bearle and Means (1932) analyzed the roles and relationships between businesses and their governing powers. Jensen and Meckling further expanded the theory in 1976. Jensen and Meckling (1976)

posited that an agency relationship exists when one or more parties join to perform a service, with an incentive being the catalyst to meet the obligations. Fleisher (1991) later extended the work and identified key constructs underlying the theory: the implementation of functions is less costly and more efficient if executed by the agent rather than the principal; the agent implements functions because the principal is incapable of executing duties and its skillset is inadequate to provide the desired services; the agent can serve as a symbolic signal to third parties, and the agent can operate as an entrepreneur to address challenges requiring concerted action between all parties. As applied to this study, the principal depends on the agent when at least one of the above conditions is present. The federal government (the principal) depends on the FPCUs (the agents) to meet specific outcomes, such as cohort default rates and 90/10 rule ratios, given the incentive of revenue in the form of Title IV funding eligibility to the for-profit postsecondary education businesses to address the challenges of providing quality education/training.

Operational Definitions

Federal Student Aid (FSA): FSA is an office of the U.S. DOE that serves as a centralized source for federal financial assistance programs (U.S. DOE, 2021a).

Financial aid: Financial aid refers to funding awarded to students to help cover educational expenditures not to exceed the cost of attendance (U.S. DOE, 2021b).

Integrated Postsecondary Education Data System (IPEDS). IPEDS is an archival database clearinghouse that tracks institutional statistics across the United States (NCES, 2019).

National Center for Education Statistics (NCES): NCES is the primary organization that compiles education comparison data for the United States and other nations. (McFarland et al., 2019).

Proprietary colleges and universities: Proprietary colleges and universities refer to privately owned for-profit higher education institutions (Vega & Chen, 2021).

Three-year cohort default rates: Three-year cohort default rates refer to the number of borrowers who defaulted on federally funded loans during a repayment period, where the numerator is the number of borrowers defaulted and the denominator is the number of borrowers who enter repayment (U.S. DOE, 2021b).

Assumptions, Limitations, and Delimitations

Assumptions

Assumptions in research are ideas understood to be true without a viable process that confirms its authenticity (Laguerre, 2023). I assumed that the participants used in this study submitted complete information to the appropriate postsecondary federal entities. I assumed that the participants used in this study submitted information within the specified timeframes for the appropriate postsecondary entities. The assumption in this study was that the information retrieved from the public government secondary data sources was accurate.

Limitations

Limitations are factors outside the researcher's control that may limit or weaken the study results (Theofanidis & Fountouki, 2018). For nonexperimental research, an archival design is an approach used to retrieve data. The researcher's bias is minimized when using an archival design. However, one limitation of the study was the use of archival data. In an archival design, the primary data collection process is not controlled by the researcher using the archived data. By relying on secondary data, the researcher faces limitations related to the cost and availability of data (Smyth et al., 2018). Another limitation of the study was the fundamental weakness of the correlational design. Correlation does not equate to cause and effect (Limeranto & Subekti,

2021). This study was based on nonexperimental research, which does not manipulate variables to assess causation. A correlational design presents the relationships between variables (Adams et al., 2017).

Delimitations

Delimitations include factors controlled by the researcher to establish the boundaries of the study (Theofanidis & Fountouki, 2018). A delimitation of this study was the choice to use a nonexperimental research design. Using the nonexperimental approach binds the study to data collection designs such as retrieving archival data, which inhibits the researcher's ability to manipulate the independent variable (Renbarger et al., 2019) ethically. I used secondary data from publicly accessible government repositories. Data from IPEDS contain information for U.S. private, public, and proprietary colleges and universities. Researchers at the U.S. GAO examine funding practices for proprietary and not-proprietary institutions using FSA, IPEDS, NSLDS, and NCES (Scott, 2009).

I selected the FSA, IPEDS, NSLDS, and NCES data repositories for this study because of their reliability and ease of access. This study was delimited to FPCUs in California that offer 2 or more–year degrees, which could theoretically limit the generalizability of the findings. The results of this study might not apply to FPCUs in states and countries outside of California.

Significance of the Study

Contribution to Business Practice

The results of this study may be valuable to business leaders in the proprietary postsecondary education business sector. A significant role for business leaders is to manage revenue. Concerning leaders within the proprietary postsecondary education sector, revenue is often directly related to the institution's ability to receive Title IV funding. Therefore, proprietary

postsecondary education leaders seek to make decisions that influence positive Title IV eligibility factors. This study is significant to business practices because it may provide a practical model for better understanding the predictive relationship between federal regulations compliance and revenue. A significant predictive model can aid and support leaders in predicting revenue and, more importantly, employing interventions to mitigate federal regulations compliance.

Implications for Social Change

The implications for positive social change include the possibility of increasing access to higher education. The results may help proprietary postsecondary education leaders reduce the risk of noncompliance with federal regulations. Minimizing noncompliance may help postsecondary education institutions maintain Title IV funding, thus increasing access to education in the community.

A Review of the Professional and Academic Literature

The literature review provides the reader with previous studies that relate to a study undertaken (Paul & Criado, 2020). The review is the framework for establishing the importance of a current study and a benchmark for comparing the results of a current study with other findings (Paul & Criado, 2020). The literature review is the critical evaluation of published research. Researchers organize, integrate, and evaluate previously published material during the literature review to clarify a problem. Xiao and Watson (2019) stated that the literature review defines problems, summarizes previous research findings to inform the reader of the research, and identifies relationships, contradictions, and inconsistencies. The literature review is a survey of previous studies to support the relevance of this study, providing insight into examining the relationship between revenue, cohort default rates, and 90/10 rule metrics for proprietary postsecondary education institutions.

For-profit postsecondary education institutions rely heavily on Title IV funding from the federal government as their largest revenue source. To retain funding, the leaders of these institutions must adhere to federal regulatory requirements; therefore, understanding the regulatory factors that influence gross revenue can be useful to organizational leaders. Investigating how different variables impact gross revenue enables scholars and practitioners to design and implement practical approaches to address gross revenue. The purpose of this quantitative correlational study was to examine the predictive relationship between 90/10 rule ratios and cohort default rates with gross revenue by institution size. The research question was: What is the predictive relationship between cohort default rates, 90/10 rule ratios, and gross revenue by institution size? The null hypothesis was: There is no statistically significant predictive relationship between cohort default rates, 90/10 rule ratios, and gross revenue by institution size. The alternative hypothesis was: There is a statistically significant predictive relationship between cohort default rates, 90/10 rule ratios, and gross revenue by institution size.

References for this study came from targeted searches in a variety of databases. A preliminary inquiry returned more than 200 articles from the Walden University Library and Google Scholar. The keywords and phrases used to search topics included *agency theory*, *student loans*, *student financial aid*, *for-profit postsecondary education colleges*, *for-profit colleges*, *90/10 rule*, *90/10 metrics*, *cohort default rates*, *Title IV regulations*, *Title IV funding*, *Title IV student financial aid*, *principal-agent theory*, and *law and compliance.* From the search results, 125 sources were relevant to this study. The primary focus was on peer-reviewed articles from 2019 to 2023. However, the review included sources outside this range based on their relevance to the study topic. Over 85% of the references are peer-reviewed and published between 2019 and 2023.

Table 1

Summary of Sources

Reference type	Frequency	Percentage
Peer-reviewed journals within 5 years of 2023	98	78%
Peer-reviewed journals more than 5 years of 2023	14	11%
Books within 5 years of 2023	0	0%
Books more than 5 years of 2023	4	3%
U.S. federal websites within 5 years of 2023	7	6%
U.S. federal websites more than 5 years of 2023	0	0%
Documents within 5 years of 2023	2	2%
Documents more than 5 years of 2023	0	0%
Total	125	100%

The literature review comprises various topics, including the theoretical framework, the constructs of the principal agency theory, and rival theories. The literature review also includes an analysis and synthesis of literature about the independent variables: cohort default rates and 90/10 rule ratios. Additionally, I review the literature about the dependent variable gross revenue by institution size. I discussed the appropriate tools to measure the constructs of the study and the methodologies relevant to the dependent variable. Finally, the end of the section includes a synopsis of the details and a transition to the next section.

Application to the Applied Business Problem

The purpose of this quantitative correlational study was to examine the predictive relationship between cohort default rates, 90/10 rule ratios, and gross revenue by institution size. The independent variables were cohort default rates and 90/10 rule ratios. The dependent variable was gross revenue by institution size. A ratio scale of measurement was applied to measure gross

revenue by institution size for each institution that was included in the study. The amount of gross revenue was measured for institutions that fall within designated enrollment size brackets. The targeted population was 303 for-profit postsecondary Title IV institutions in the United States. Secondary data collection was from publicly accessible repositories that provide data from U.S.-based postsecondary education institutions. Government repositories make these data available to the public every 3 years.

In this study, I focused on data from 2014–2018. The sources of data included the NCES, IPEDS, and the NSLDS. The results of this study may contribute to social change by bringing awareness to for-profit postsecondary education industry leaders regarding impacts to Title IV funding eligibility, which may result in more access to higher education for nontraditional students.

Agency Theory

According to agency theory, ownership and control are distinct (Sulaiman & Zuhairah, 2021). The application of agency theory is appropriate to understand the relationship between ownership and management structure. The agency model may undergo modification if there is separation to accommodate management priorities with the stakeholders. According to this view, employees are accountable and responsible for their jobs and duties. Keeping the personnel in check occurs using a monitoring system or aligning incentives. For the preservation of the interests of top management, a description of the corporate governance structure is essential. According to the notion, voluntary disclosures are necessary to decrease information disparities between partners that are contractually tied. Instead of just meeting stakeholders' needs, the employee should practice good governance. The theory strongly focuses on the connection between a company's performance and its management structure or board independence.

Agency theory typically refers to the division of ownership and control between principals and agents, resulting in information asymmetry, where agents have a better understanding of the organization and how it operates than their principals (Abed & Ackers, 2021). Ross and Mitnick developed the theory of agency in 1973 independently and concurrently while pursuing differing points of view (Mitnick, 2021). Mitnick (2019) shaped the narrative for the institutional theory of agency, and Ross for the economic theory of agency. A solid theory for influencing the actions of economic actors, agency theory has long provided a helpful theoretical framework for creating incentive and rule-based systems. Agency theory addresses issues with competing interests among purportedly cooperating partners at a fundamental level (e.g., agents and principals; Solomon et al., 2021). Institutional agency theory is the analysis of the principal-agent relationship based on the entities that are formed around the agency and how they manage agency relationships (Kamdjoug et al., 2020). Agency theory provides insight into the relationship between entities and how they interact. I explore multiple approaches to agency theory in the subsequent sections of this chapter.

Positivist Agency and Principal Agent Research

Wagner (2019) noted two distinguished approaches to agency: positivist agency theory and formal principal-agent theory. Positivist agency researchers attempt to identify cases where conflict exists between the agent and the principal and describe the appropriate form of governance preventing agents from acting in self-interest (Klačmer Čalopa et al., 2020). According to Klačmer Čalopa et al. (2020), when the contract between the principal and the agent is outcome-based, the agent is more likely to behave in the principal's interest. When the principal has information to verify the agent's behavior, the agent is more likely to behave in the interest of the principal. Principal agent researchers focus on the principal–agent relationship, the

optimal contract, and executives' behavior versus the outcome between the principal and the agent.

Positivist and principal–agent studies include common views that contracting problems occur because of the self-interest maximizing objective of both the principal and the agent and because the concern of both is minimizing agency costs (Matinheikki et al., 2022). However, when the principal–agent researchers focused on risk-sharing and the nature of what constitutes an optimal contract, the positivist agency researchers explored aspects of the organizational environment and technology concerned with monitoring the contractual relationship. Wicaksana et al. (2019) identified the concerns as organizational behavior and corporate governance.

Principal–agent problems occur in many agency models used in corporate finance when the principal must choose the appropriate compensation plan for the agent based on performance metrics and the outcome. Depending on the availability of monitoring and the information structure, the most practical contract (outcome-based or behavior-based) should be selected for effective agency relations (Tekin & Polat, 2020). Positive scholars claim that because outcome-based contracts will lessen the agent's opportunistic conduct, they will encourage the agent to act in accordance with the principal's objectives. The behavior-based contract is appropriate if the principal has information systems available to confirm the agent's behaviors. Principal–agent research, on the other hand, addresses asymmetric information as the primary cause of the agency problem (Tekin & Polat, 2020).

Principal–Agent Theory

Bearle and Means (1932) established the foundation of agency theory with the Bearle-Means thesis (Villalonga, 2019). Bearle and Means posited that business leaders should separate ownership and control and establish a board of directors to control the business instead of the

owners. The researchers theorized that business executives make final decisions when management becomes ineffective. Jensen and Meckling (1976) expanded the institutional theory of agency to include the principal–agent relationship, where business leaders are accountable to each other based on an incentive-driven model.

I analyzed the research through the lens of the PAT, a theory credited to Jensen and Meckling (1976). According to PAT, principals enter into a contractual agreement with agents to accomplish goals (Ward, 2019). In such contracts, sometimes the agents behave in more self-serving ways than exhibit behavior that accomplishes the goals set forth by the principals. To minimize the risk of self-serving behavior by the agents, principals may negotiate with the agents to develop a set of rules to ensure the goals are met and remain the focus of the contract. The PAT is an acceptable framework for examining the interaction between the government and universities (Lee et al., 2020). The PAT is applicable for examining accountability issues in for-profit postsecondary education organizations, as the theory incorporates the issues of goal conflict, information asymmetry, and uncertainty of outcomes from the relationship between principals and agents (Kuntum, 2019). Ward (2019) used PAT as the foundation to examine the relationship between government agencies and FPCUs. Ward posited that the 90/10 rule and cohort default rate policies indicate the PAT at the federal level. As it relates to this study, a principal–agent relationship was evident between the U.S. federal government and the FPCUs, where the U.S. federal government serves as the principal, and the FPCUs serve as the agents.

For-profit postsecondary education institutions are being scrutinized and accused of fraudulent activity by their students regarding financial federal aid due to ineffective and inefficient internal control (Hawkins Fountain, 2019). Because of these asymmetries, federal agencies instituted compliance guidelines for monitoring FPCUs' outcomes (Riegg Cellini &

Turner, 2019). The intent of monitoring performed by federal agencies is to reduce asymmetric incentives. Because FPCUs' business leaders experience few consequences for ineffective and inefficient internal control within their organizations, federal guidelines and monitoring should lead to effective and efficient internal control and better operating performance.

The intrinsic incentives resulting from the agency relationship provide a mechanism to control the behavior of leaders of FPCUs. Advocates of agency theory support the belief that agency relationships in organizations play a large part in business leaders complying with federal compliance guidelines (Schillemans & Bjurstrøm, 2020). Directing the behavior of business leaders to maintain effective and efficient internal control and a level of accountability to beneficiaries and other stakeholders is the desired outcome of the agency relationship. Agency theory was the theoretical lens chosen for this study because it provided an explanation of the behavior of business leaders regarding their accountability to beneficiaries and other stakeholders and effective and efficient internal control.

An agency relationship represents a contract because presumptive cooperative behavior between a principal and an agent at the management level is at the core of an agency-structured relationship. Van der Kolk (2019) contended an inherent goal conflict exists between the principal and the agent based on the inducements and contributions of the employment relationship. Meliana and Ansar (2020) posited that risk-sharing occurs among individuals and groups and contended that risk-sharing problems arise when cooperating individuals have different attitudes toward risk. Koksal and Strahle (2021) and Jensen and Meckling (1976) agreed that the domain of the agency theory is the relationship between principal and agent and mirrors a contract, thus broadening the risk-sharing literature by including agency problems. Although agency

relationships represent contracts and goal conflict, differences in risk sharing exist between principal and agent, which affects business leaders' accountability and internal control.

An assumption of agency theory is that a conflict of interest exists between the principals (beneficiaries of goods and services provided by organizations) and the agents (managers) relating to the benefits received (Vitolla et al., 2019). Both parties in the principal–agent relationship want to maximize their residual income (i.e., benefits received and income), and there is a conflict of interest between principals and agents (Fatmawatie & Endru, 2022). Due to this conflict of interest, the principal–agent relationship will result in agency costs. However, maximizing the residual income available to principals requires minimizing costs, including agency costs.

The preceding discussion indicates that agency theory enables the understanding of compensation structures for top organizational executives. In addition to articulating the relevance of incentives, agency theory has organizational, system evaluation, behavioral, allocation, and optimal control monitoring roles (Schillemans & Bjurstrøm, 2020). The organizational role arises because agency theory includes a reason why managerial control in an organization is necessary and ways to achieve control—that is, by resolving the information asymmetry problem in which the principal implements control measures, such as voluntary disclosures (J. Liu & Ma, 2021). The basis of such control measures is observable performance outcomes, hence, the agency theory's system evaluation role. The assumption that an agent does not perform in the best interest of the principal and that the agent is work-averse explains the behavioral role of the agency theory. The principal could use the board to monitor top executives and describe governance practices to solve agency problems.

The allocation role of agency theory develops from the assumption that it is possible to derive a contract that maximizes the utility of the agent and the principal and leads to the efficient allocation of company resources and risk sharing. Also, a control system serves as a mechanism that the agent and principal can agree will provide the type of information needed for control and efficient risk sharing (Meliana & Ansar, 2020). Thus, agency theory is a sound basis for assessing the optimality of managerial accounting systems as well as performance evaluation systems.

An understanding of the relationship between FPCUs' business leaders' accountability and the expectations of beneficiaries and governments is important to address agency problems. Ward (2019) used PAT to examine the role of dependency in the relationship between the federal government and FPCUs. Ward posited that governmental regulations are means to control the behavior of FPUCs. For-profit postsecondary education institution business leaders are accountable for the areas of finance and operations, disclosure and transparency of financial transactions and the use of funds, and oversight of the organization's management decisions (Du & Xia, 2019). To achieve the expectations of beneficiaries and governments, business leaders of FPCUs must implement control mechanisms that address agency problems, such as internal control systems. Agency theory was appropriate for this study because it applies to the accountability of FPCUs' business leaders and the expectations of beneficiaries and governments, and it contributes to the research on the effectiveness and efficiency of organizations' internal control and operations.

The Relationship Between Agency Theory and Accountability

From the perspective of citizens and taxpayers, the concept of accountability evokes a sense of responsibility to others for performance, compliance, disclosure of information and transparency, and efficient delivery of services to those in need of assistance (Smith & Benavot,

2019). Accountability also suggests external responses regarding compliance with laws and industry standards. Bracci (2022) noted the four components of accountability: transparency, answerability, compliance, and enforcement. Bracci posited that based on agency theory, the transparency version of accountability has a superior (principal) who evaluates the output of a subordinate agent. However, Saxton et al. (2014) noted the components contribute to accountability by (a) collecting information, (b) making it available and accessible for public scrutiny, (c) providing clear reasons for actions and decisions, (d) monitoring and evaluating procedures and outcomes, (e) and helping to enforce sanctions for shortfalls in compliance, justification, or transparency. Because of the lack of agreement on a precise definition of accountability, an understanding of the relationship between principal and agent is necessary to determine the effect of agency theory on FPCU leaders' accountability.

The issue of accountability concerning FPCUs is relative to the nature of the organization and within the context of the relationship between the various constituents. For example, organization leaders can be accountable to funders, regulators, and clients, who are the organization's principals according to their functional relationship (Schillemans & Bjurstrøm, 2020). Accountability, as it relates to PAT and the relationship between the U.S. government and FPUCs, can be traced to the late 1980s, when the GAO found that 75% of federal student aid fraud involved FPCUs (Ward, 2019). Accountability measures, such as performance-based funding, were put in place to target postsecondary education to combat fraud. Over the last 2 decades, accountability measures have increased in the higher education sector, focusing on regulatory compliance and federal student aid funding (Ward, 2019).

Kelchen (2018) found the frameworks for accountability in the for-profit postsecondary education sector based on the PAT model. In this model, the federal government (the principal)

attempts to influence FPUCs (the agents) by rewarding or pushing the institutions based on desired outcomes. In the PAT model, FPUCs receive incentives to improve performance to meet the regulatory goals as outlined by the federal government. Because FPUCs depend on federal funding as their main source of revenue, FPUC leaders alter their behavior to comply with the goals of regulations and become accountable to the federal government (Kelchen, 2018).

Based on Bracci's (2022) work, the definition of accountability in this study was FPCU business leaders' adherence to contract agreements, resulting in a high level of internal control. A FPCU is effective and has an acceptability level of internal control if it is compliant with federal regulatory guidelines in internal control. The primary benefit for organizations whose leaders accept this notion of accountability is greater congruence among the organizations' mission, internal control, and regulatory compliance.

The purpose of any for-profit business is to earn a profit for the service it provides (Guo & Peng, 2020), which is self-serving for the business. The goal of the United States federal government is to ensure that federal funds are not the sole source of revenue for the for-profit education sector (Watkins & Seidelman, 2017) and to hold these institutions accountable for assisting in the reduction of student loan defaults (Ward, 2019). There is a contract between the principal and the agents who seek to align the financial goals of FPCUs with those of public interests enforced by the U.S. federal government (Ward & Tierney, 2017).

Contrasting Theories

In tandem with the development of the various conceptual definitions of accountability, existing literature includes various theoretical frameworks through which FPCU business leaders achieve accountability and efficiency in federal regulatory compliance to receive Title IV student financial aid. As mentioned, PAT served as the lens through which this study was viewed.

Stakeholder theory, stewardship theory, and resource dependency theory are three contrasting theories discussed in this section, with definitions providing insight into the tenets of each. A summary presents the differences between the contrasting theories compared to the PAT.

Stakeholder Theory

In 1970, theorists introduced the concept of stakeholders to the management discipline, later expanding it to encompass a wide variety of stakeholders for corporate accountability (Sulaiman & Zuhairah, 2021). *Stakeholder* was a term to define, evaluate, manage, and enhance effective stakeholder coordination. This approach stands out due to its emphasis on the firm's responsibility to more than just its shareholders. Any group or person that has the potential to influence or be affected by the accomplishment of an organization's goals is a stakeholder, including business partners, employees, and suppliers. The relationship with several groups would influence the decision-making process, and stakeholder theory emphasizes that the interests of all stakeholders should be treated equally and intrinsically (Sulaiman & Zuhairah, 2021). Stakeholders and shareholders recommend different corporate governance systems and monitoring mechanisms.

Stakeholder theory can be useful to examine the relationship between entities that are linked through a common business interest. Bridoux and Stoelhorst (2022) noted that stakeholder theory was established as a theory of strategic management, or maybe more appropriately, as a perspective. Organization leaders who employ stakeholder theory recognize that others might be interested in their achievements and activities (Latapi Agudelo et al., 2019). Stakeholder theorists view strategic management as a primary concern with managing social interactions: the core tenet of the theory is that creating trusting relationships with the firm's stakeholders is crucial to value generation (Dmytriyev et al., 2021). In that regard, stakeholder theory is a theory that formally

embraces a moral dimension (fairness), a social dimension (managing relationships), and an economic dimension (value creation) (Bridoux & Stoelhorst, 2022).

A central premise of stakeholder theory is that by focusing on all stakeholders, the creation of value by the firm is good for firm performance (Valentinov & Hajdu, 2019). However, stakeholder theory does not explain the conflict in the interests and goals of the various stakeholders in the firm, whereas agency theory does explain the conflict (Marashdeh et al., 2021). For example, shareholders can withdraw from the firm by selling their shares. In contrast, other stakeholders, such as employees and beneficiaries, may find it difficult to change their employment abruptly or may lose an essential source of goods and services should they withdraw from the firm.

De Freitas Langrafe et al. (2020) argued that stakeholder theory is relevant to higher education institutions when attempting to develop improved relationships between the institutions and their stakeholders. Additionally, Schubert and Willems (2020) contended that in stakeholder theory, the agent will act for the principal's benefit irrespective of incentives. Schubert and Willems also noted that conversely, the PAT the agent acts in accordance with incentivization. Stakeholder theory does not have the predictive power that PAT does within the context of influences on an organization's behavior. Therefore, stakeholder theory was not appropriate for this study.

Stewardship Theory

Stewardship theory has its roots in sociological and psychological theories and is founded on the idea of management motivation. According to this notion, managers and executives who work for and defend shareholders are stewards (Sulaiman & Zuhairah, 2021). Top management's responsibility as stewards is highlighted and their goals integrated with company goals. Even if

left alone, stewards will be accountable for the resources they oversee. The achievement of organizational performance makes stewards happy and motivated. In line with stewardship theory, the chairman and CEO positions should be combined to cut agency costs and increase their role in the organization. Stewards are self-actualizing, focused on achievement, involvement-oriented, and trustworthy because the firm comes before their personal self-interest. For this theory to apply to corporate governance, managers must have roles, powers, and responsibilities that are explicit and unambiguous by the organizational structure.

As with agency theory and stakeholder theory, stewardship theory can be useful for analyzing relationships between entities linked through a common business interest. Historically, scholars have used agency theory when examining leadership behaviors and responsibilities (Zollo et al., 2019). According to agency theory, leaders are people who make decisions for their own benefit rather than the benefit of the group (Jensen & Meckling, 1976). Stewardship theory emerged as a substitute for agency theory (Chrisman, 2019). Some academics hypothesized that stewardship theory is still under development but could grow toward a more useful application like agency theory with more investigation (Chrisman, 2019; Zollo et al., 2019).

In accordance with stewardship theory, managers are not opportunistic or self-interested people (Dumay et al., 2019). Stewards' desire to benefit the group is an innate quality. Because they support the goals of their organizations, stewards take advantage of the authority that comes with their position. The "best interest" of the collective alludes to a leader and the collective having a shared responsibility for the organization's long-term success (Nijhof et al., 2019). Dumay et al. (2019) noted that stewards prioritize developing long-term relationships, which impacts their behavior. In comparison, Chrisman (2019) suggested agency theory accepts that

people may or may not act opportunistically rather than basing assumptions on an exaggerated portrayal of human nature.

Franco-Santos et al. (2017) associated higher education governance with stewardship theory. Internal controls are implemented to achieve collaborative methods for reaching goals rather than a top-down control approach. There is an inherent conflict of interest between the principal and agent, resulting in a low level of internal control and inefficiencies in operations. Franco-Santos et al. also indicated the application of stewardship theory helps in understanding the roles and responsibilities of agents for accountability but does not explain the conflict between principal and agent in FPCUs. X. Liu (2020) argued that stewardship theory stems from intrinsic motivation, whereas PAT references extrinsic motivation. There are inherent differences between stewardship theory and PAT. Therefore, stewardship theory was not the theoretical lens chosen for this study.

Resource Dependence Theory

Unlike the agency, stakeholder, and stewardship theories, resource dependence theory does not focus on relationships between entities; instead, the focus is on resources. Pfeffer and Salancik developed resource dependence theory in 1978 (Hawkins Fountain, 2019). Resource dependency theory, which highlights how a firm's external resources affect leaders' behavior and the adoption of a strategic approach to corporate governance, emerged from the fields of sociology and management (Sulaiman & Zuhairah, 2021). The theory emphasizes the board of directors' function in helping company leaders obtain the outside resources they need through organizational relationships. According to this view, independent organization representatives are chosen as a tool to access resources vital to a company's growth. In accordance with resource dependence theory, organizations that rely on external resources to survive would adapt their

behavior in reaction to laws that put those resources in danger. Federal financial aid is a major source of funding for many for-profit colleges that might not be able to compete in the higher education market without it. The resource dependence theory has been frequently utilized to explain how colleges and universities construct their organizational structure, manage their operations, and modify their behavior. When leaders of higher education institutions look for alternative revenue streams, they make an implicit agreement that influences their behavior and directs them to new paths that may conflict with the institution's missions (Whatley & Castiello-Gutiérrez, 2022).

Resource dependence theory was appropriate to define the relationship between the federal government and FPCUs regarding the institutions' dependence on the federal government as its greatest source of revenue. The theory focuses more on the power dynamics between entities, whereas agency theory focuses more on the conflict of goals between the principal and the agent (Cuervo-Cazurra et al., 2019). Agency theory provides a better basis for understanding the relationship between FPCUs and the federal government because the need for federal oversight was born from the idea of fraud and the self-serving interests of proprietary education institutions.

Summary of Agency Theory, Stewardship Theory, Stakeholder Theory, and Resource Theory

Corporate governance has been a significant area of interest in both the business world and academic studies (Marashdeh et al., 2021). Fundamental theories relevant to the discussion of corporate governance include the agency theory, which has been further developed into stewardship, stakeholder, and resource dependency theorie. There are similarities and differences between the four theories. Although each theory has flaws, they can support one another, taken as

a whole (Marashdeh et al., 2021). According to Zollo et al. (2019), agency theory is the lens that scholars most frequently utilize when studying financial economics and governance because of its practical usefulness. Nijhof et al. (2019) posited that stewardship theory is a way to manage an organization's resources and obtain the best results for the group. Whereas agency theory promotes a conflict- and control-filled environment, stewardship theory emphasizes autonomy and self-control. Unlike agency theory, stewardship theory focuses more on leadership with a smaller power distance that keeps stewards close to leadership, whereas agency theory requires more supervision and control mechanisms (Zollo et al., 2019).

According to stakeholder theory, a company's duties extend beyond generating profits for stockholders and include its leaders taking into account the interests and claims of diverse groups impacted by its decisions (Sharma & Gupta, 2019). Managers are responsible for maximizing the financial market values of businesses. In contrast, traditional economic theory, particularly agency theory, holds that managers should balance stakeholders' interests to promote cooperative relationships (Bridoux & Stoelhorst, 2022). Indicating that human conduct is significantly more complex, stakeholder theory is unlike classic economic theory, which maintains that people behave like Homo economicus, following their own interests through rational decision-making in response to financial incentives. Researchers have found stakeholder theory to be the logical extension of agency theory, even though the two theories have conflicting assumptions and implications (Sharma & Gupta, 2019).

It is necessary to grasp agency and resource dependence theories to comprehend the whole spectrum of power relationships (Cuervo-Cazurra et al., 2019). The foundation of resource dependence theory is the premise that external resources can influence a firm's performance and behavior (Marashdeh et al., 2021). While true, the premise does not account for conflicting goals

between relevant entities. According to agency theory, shareholders presume that business leaders will make decisions and act in the best interests of the shareholders, but this is not always the case. The underlying assumption of agency theory is that problems with agency develop because of conflicts of interest between agents and principals (Marashdeh et al., 2021). Despite the similarities between agency, stewardship, stakeholder, and resource theories, agency theory aligned best with the purpose of this study to examine the relationship between entities based on conflicting goals.

Measurement

Researchers select the appropriate measurement tools for a study to substantiate the validity of the research. Validity refers to the capacity to accurately reflect the construct it is intended to gauge (Philips et al., 2021). Internal validity is the degree to which changes in an independent variable may be ascribed to changes in a dependent variable (Makaruk et al., 2022). Measurement problems impact a study's internal validity. The measures must be valid (measuring what they are designed to measure) and dependable for the data collected to be considered legitimate (measuring the same way each time; Siedlecki, 2020). In quantitative research, the measurement process follows a conservative forward sequence: Conceptualization comes first, then operationalization, and finally, the application of the operational definition or measurement of the gathered data (Mehrad & Tahriri Zangeneh, 2021). Measurement tools and data analysis expressed in statistics are necessary for quantitative research.

Data analysis is the process of applying statistics to condense data into a simpler form for comprehension and analysis (Karta et al., 2022). Based on this study's objectives, correlation and regression approaches to examine two predictors and one criterion were the approaches used to analyze the data. The predictor variables were cohort default rates and 90/10 rule ratios, and the

criterion variable was gross revenue by institution size. Multiple regression, with the help of the SPSS application, was the correlation test used to test the hypotheses.

Measuring cohort default rates (see Appendix B) and 90/10 rule metrics (see Appendix C) can provide FPCU leaders with insight into the factors that influence revenue, which enables institutional leaders to implement strategies to satisfy federal regulations that impact their bottom line. Cohort default rates and 90/10 rule metrics are among the most prominent federal policies regulating Title IV federal funding eligibility requirements for higher education institutions (Hodgman, 2018). Policies concerning the 90/10 rule ratios and cohort default rates stipulate behavior compliance by FPCUs (Ward & Tierney, 2017). The ability of FPCUs to meet federal regulations determines the amount of Title IV revenue the institutions are eligible to receive. These regulations have a major impact on the for-profit postsecondary education industry's revenue goals, as Title IV funds make up to 90% of their revenue (Hawkins Fountain, 2019).

Cohort Default Rates

One of the two independent variables was cohort default rates. After applying an ordinal scale of measurement to measure cohort default rate compliance, I ranked the cohort default rates, assigning 0 for compliance and 1 for noncompliance. Federal government leaders collect raw data from each IHE to determine cohort default rates by evaluating the number of students who entered repayment in a given fiscal year and who defaulted within a specified number of years of their repayment date (Looney & Yannelis, 2019). U.S. DOE reviewers divide the total number of students who entered repayment (denominator) in a given fiscal year by the total number of students who defaulted within a specified number of years of their repayment date (numerator).

Riegg Cellini and Koedel (2017) discussed the substantial increase in federal aid for FPCUs and described the impact graduates from FPCUs who are unemployed or underemployed

make on taxpayer dollars. The researchers found that total educational costs were higher for students and taxpayers at for-profit colleges than public and private nonprofit colleges. Gilpin and Stoddard (2017) discussed the substantial differences between the number of federal loans taken out by students at FPCUs and those from other IHEs. Gilpin and Stoddard noted that 17% of public community college students, 48% of 4-year public college students, and 73% of FPCU students had federal loans. Natow (2020) suggested that all higher education sectors should provide a good value to their respective students to protect the institutions' and the public's investments. In 2020, the outstanding balance of loans under all Title IV programs was more than $1.6 trillion (Portis, 2020). The U.S. DOE (2019) requires IHEs to disclose cohort default rates to qualify for federal student aid funding.

The for-profit postsecondary education sector has unique economic challenges. Education institutions are not liable if students default on their federal loans, and taxpayers must cover the costs of unpaid amounts. This lack of culpability incentivizes profit-maximizing college leaders to enroll students, make the students responsible for their loans, and not worry about their ability to repay the loans (Yannelis & Tracey, 2022). Bruckner (2020) posited that more focus on student outcomes might reduce the substantial harm caused to students and taxpayers from troubled institutions. Hawkins Fountain (2019) discussed the origin of the federal aid eligibility challenges that FPCUs face. These challenges stemmed from accusations of FPCUs' fraudulent practices concerning federal aid and recruiting. The changes require graduates of FPCUs to meet specified loan repayment rates to maintain eligibility for federal student aid programs. Montalto et al. (2019) noted that students attending for-profit postsecondary institutions borrow more than students in other higher-learning sectors and identified these differences as directly related to default rates. Students with higher borrowing behavior are more likely to default on their loans. Conversely, Looney and Yannelis (2019) stated that large student loan balances have historically

not had a significantly negative impact on student loan defaults. However, FPCUs' failure to meet federal cohort rates compliance prevents the institutions from receiving federal Title IV student aid.

90/10 Rule Ratios

The 90/10 rule ratio was the second independent variable measured in this study. I applied an ordinal scale of measurement to measure 90/10 rule ratio compliance and ranked the ratios as 0 = compliant and 1 = noncompliant. The federal government collects raw data from each IHE to determine the 90/10 ratio using percentages of various sources of federal aid revenue received by a FPCU. The rule mandates that a minimum of 10% of an institution's revenues, including tuition, fees, and other charges, must be collected through revenue sources other than federal Title IV student aid, leaving up to 90% of revenue available to be collected through federal aid sources (Riegg Cellini & Koedel, 2017). For this calculation, the U.S. DOE divides the amount of total revenue collected from all sources (denominator) by the amount of revenue collected via nonfederal aid sources (numerator).

Unlike cohort default rates, the 90/10 rule ratios apply only to FPCUs. This rule was a response to fraudulent enrollment tactics in FPCUs (Ward, 2019). The 90/10 rule ratios are a potential hindrance for FPCUs. The rationale behind the rule is that students should be willing to invest financially in receiving a quality education. However, FPCUs are more likely to service lower-income students, who may not be able to financially contribute to higher education, thus making it more difficult for FPCUs to satisfy the 90/10 requirement (Tucker, 2021). Failing to meet 90/10 rule ratios compliance prevents FPCUs from receiving federal Title IV student aid, directly affecting the revenue earned by FPCUs.

For-profit organizations rely on federal student aid and the GI Bill significantly more than institutions in other industries, and they also end up with a significant amount of these subsidies (Riegg Cellini, 2021). To meet the 10% non–Title IV revenue requirement of the 90/10 rule, some stakeholders have claimed that proprietary IHE leaders intentionally target the enrollment of servicemembers, veterans, and their families who are qualified for GI Bill educational benefits (Hegji, 2021). Veterans' GI Bill benefits do not count toward the 90/10 rule ratio; thus, if they are used more frequently at an institution, their share of the Title IV program revenue will be lower (Riegg Celini & Turner, 2019). Essentially, a school may enroll nine additional students under other federal loan programs for every student enrolled under GI benefits. The post-9/11 GI Bill provided institutions with an avenue for intensive margin increase through conventional federal student loan programs for institutions running close to the 90% barrier and in danger of losing the federal funds on which they rely (Looney & Yannelis, 2022). Only institutions that rely extensively on federal funding and are close to the 90% threshold would be impacted by this channel. The 30 largest for-profits reported total revenues of $10.5 billion for the 90/10 rule, of which $7.7 billion came from Title IV monies, resulting in an average 90/10 ratio (dollar-weighted) of 73%. The 90/10 ratio would have been 81% if not for the GI Bill or other Department of Defense tuition subsidies, which comprised $1.0 billion of those revenues (Looney & Yannelis, 2022). Numerous sizable for-profit universities would have violated the rule or been perilously near. They would have needed to cut back on their use of federal student loans, resulting in a large amount of their revenue being inaccessible.

Revenue: Financial Aid

The dependent variable for this study was gross revenue (see Appendix D) by institution size (see Appendix G). I applied a ratio scale of measurement to measure gross revenue by

institution size for each institution included in the study. Ratio scales measure the order of variables, differentiate between the values of the scale, and include zero as a starting point (Allanson & Notar, 2020). I measured the gross revenue for institutions within designated enrollment size brackets. Each IHE must report raw revenue data to the U.S. DOE to be used to determine student federal aid eligibility.

FPCUs receive revenue from federal/state grants and loans awarded to students, internal grants from the institution, scholarships awarded to students from third-party sources, and out-of-pocket payments (Ward, 2019). Prior to the 1970s, FPCUs received revenue from private dollars. During the 1970s and 1980s FPCUs became eligible to receive federal funding, which resulted in a shift of FPCUs receiving most of their revenue from private sources to federal aid (Ward, 2019). Bañuelos (2019) outlined the following federal financial aid timeline for FPCUs: (a) between 1944 and 1952, the federal government was skeptical about distributing funds to FPCUs; (b) to meet federal qualifications, FPCUs began changing their accreditation associations during the 1950s; (c) by the end of the 1960s, a small number of federal loans were made available to FPCUs; and (d) in the 1970s, FPCUs' sole source of revenue was from student tuition, as is the case today. Hawkins Fountain (2019) stated that proprietary colleges receive up to 90% of their revenues from taxpayer-financed federal student aid: Title IV funds. During the 2013/2014 academic year, over 78% of FPCUs received more than 60% of their revenue from federal funding (Watkins & Seidelman, 2017). FPCUs' survival is dependent upon their ability to show a profit.

Title IV Regulatory Changes

Federal financial assistance is provided under Title IV funding. Federal financial aid programs that help students pay for postsecondary education at eligible higher education

institutions are authorized under Title IV of the HEA (Hegji, 2021). The HEA of 1965 was enacted in 1965 by President Lyndon B. Johnson to undergird the instructional resources of colleges and universities and provide financial assistance to students in postsecondary and higher education (Portis, 2020). The legislation established new resources for higher education, such as the TRIO programs, the Pell Grant, and assistance for institutions that serve underrepresented groups (Portis, 2020). In particular, Title IV of the legislation established the guaranteed student loans program, a public-private collaboration in which the federal government finances bank loans to students from low- and middle-income families (Portis, 2020). The federal monitoring of for-profit colleges has long been a source of political controversy.

For-profit institutions were not permitted to participate in the financial aid programs under the original HEA (Hawkins Fountain, 2019). The government made numerous adjustments to the loan program between 1965 and 1992, including creating unsubsidized, parent, and consolidated loans. The legislation governing the provision of federal financial aid to IHEs has changed due to amendments made to the HEA of 1965. The federal government modified the criteria for an IHE to be a qualified and certified participant in Title IV financial assistance programs during the 1992 reauthorization of the HEA (Guzman et al., 2021). Some of these modifications were means to address instances of fraud and abuse, and they mainly affected IHEs that provided teaching primarily through distant learning, which was defined to include both mail and telecommunications courses. Within the last few decades, federal regulation of FPCUs has garnered much attention due to large expenditures reaching almost $1 billion (Riegg Cellini & Koedel, 2017). Concerns over student results developed even as for-profit universities continued to collect billions in federal funding. In a 2010 investigation, undercover GAO investigators discovered that numerous for-profit institutions used aggressive recruitment tactics, pushed students to submit false information on financial aid applications, and gave students inaccurate

information about tuition costs (Hawkins Fountain, 2019). Additionally, for-profit universities often have greater student loan default rates than any other industry (Hawkins Fountain, 2019). For instance, in 2015, 15.8% of student loan defaulters attended for-profit universities, while 11.7% and 6.8% went to public and nonprofit institutions, respectively (Hawkins Fountain, 2019). In addition, 11.8% of student loan borrowers overall defaulted on loans within 3 years of repayment.

Cohort default rates and the percentage of revenue received from Title IV funding (the 90/10 rule) are key assessments used to determine federal aid eligibility (Ward & Tierney, 2017). Legislators enacted these federal regulations through new laws or the reauthorization of major acts aimed at addressing abuse and fraud issues within the FPCU sector. Cohort default rates regulations were established to combat growing concerns about poor student outcomes and federal student aid abuse. If more than 30% of federal student loan borrowers at an institution default on their loans for 3 consecutive years, the institution would lose its eligibility to receive Title IV funding (Riegg Cellini et al., 2020). FPCUs and public/private nonprofit colleges have separate designations under the HEA, which allows the federal government to have different regulations that govern FPCUs versus those of other higher education sectors (Ward & Tierney, 2017). The 90/10 rule specifically targets FPUCs under the HEA. The Obama Administration added another layer of regulations establishing new rules related to gainful employment (Watkins & Seidelman, 2017). The gainful employment rule made receiving federal funding more difficult for FPCUs (Ward & Tierney, 2017). Only the cohort default rate and the 90/10 rule metric were assessed for this study, as the Trump Administration deregulated the gainful employment rule (Natow, 2020).

Gainful Employment

Gainful employment was another potential variable that could have been examined in relation to an institution's gross revenue. Despite receiving money from student loans, institutions have largely avoided responsibility for their part in encouraging students to accrue unmanageable debt. The gainful employment regulations aimed to hold some IHEs accountable for excessive student loan debt were one partial exception. A targeted program would be denied access to federal financial assistance programs if its students owed too much in relation to their income (Gillen, 2022).

The federal government has long anticipated career-focused higher education programs to result in gainful employment, particularly among for-profit universities. The U.S. Department of Education created gainful employment standards in the mid-2010s, linking a program's federal financial aid eligibility to graduates' debt-to-earnings ratios (Kelchen & Liu, 2022). The gainful employment regulations proposed under the Obama Administration were a contentious set of regulations among the new regulatory and legislative initiatives to strengthen the sector's responsibility prompted by concerns about unsavory behavior at for-profit institutions (Hawkins Fountain, 2019). Under gainful employment, administrators at almost all educational programs at for-profit institutions, as well as nondegree and certificate programs at public and nonprofit institutions, were required to publicly disclose information about program graduates and ensure their graduates' debt-to-earnings ratios did not exceed regulatory limits. Programs that did not comply with gainful employment rules were in danger of losing their eligibility for government funding. Although gainful employment applied to all higher education sectors, it would be particularly noticeable at for-profit universities, 90% of which had gainful employment programs (Hawkins Fountain, 2019). Some for-profit colleges would have closed if they could no longer

get federal funding, thus losing a significant percentage of their earnings. Gainful employment rules are no longer in force, but some authorities have talked about bringing them back (Gillen, 2022). Therefore, gainful employment was not a variable in this study.

For-Profit Postsecondary Education Businesses

For-profit postsecondary education institutions are profit-generating businesses that distribute their profits among owners, investors, and shareholders. Per the requirement that for-profit institutions offer substantially equal education, training, or services more conveniently or affordably than otherwise, Title IV of the HEA (1965) enabled federal funding to for-profit universities (Tucker, 2021). Even though for-profit universities now had access to federal funding, enrollment did not immediately rise. However, additional student loan deregulation in 1986 aided in the quick growth of the for-profit sector. The landscape of higher education in the United States has transformed due to for-profit postsecondary schools. An increase in the number of students seeking postsecondary qualifications, the availability of federal student aid, and the low cost of online education have contributed to a more than threefold increase in enrolment in federally supported for-profit universities since 2000 (Riegg Cellini & Turner, 2019). Approximately 1.6 million students attend for-profit universities, making up 8% of all postsecondary enrollment. Policymakers, the media, the field of education, and students themselves all paid more attention as the for-profit sector expanded quickly. Investigations into dishonest hiring practices, misuse of federal financial aid funds, low graduation rates, and high student loan default rates have resulted in declining enrollments, high-profile bankruptcies, school closings, and the loss of federal funding for some for-profit institutions in recent years. The Obama Administration enacted new rules in 2014 to make for-profit institutions responsible for the results of their students' studies (Riegg Cellini & Turner, 2019).

The increase in for-profit schools and student enrollments has been one of the most important trends in the U.S. postsecondary sector over the past several decades. As of 2000, 2.9% of all higher education enrollment comprised 450,000 students in for-profit postsecondary institutions, and the sector's student debt ratio surpassed $1 trillion as of March 2020 (Armona et al., 2022; Li & Kelchen, 2021). For-profit institutions accounted for over 25% of all federal student assistance money at its height in 2011, enrolling 52% of students from low-income households and nearly 20% of all African American students (Armona et al., 2022). Government investigations have shown evidence of misleading marketing tactics used by for-profit businesses. (Eaton et al., 2020). Marcus (2019) identified the for-profit postsecondary education sector as a ravenous model focused on profitability instead of the value of the educational services offered to the students. Misaligned incentives lead to profit maximization, which may not be in the best interests of students (Yannelis & Tracey, 2022). According to Eaton et al. (2020), for-profit colleges have a significantly higher proportion of personnel in sales and marketing departments than other institution types. This imbalance is particularly true at for-profit universities owned by private equity, which are more susceptible to incentives that increase profits. These data suggest that FPSEIs prioritize enrolling students who pay for their education through government loans without considering the student's potential to default (Yannelis & Tracey, 2022).

In recent decades, for-profit institutions have more rapidly integrated into the American higher education system (Goldstein & Eaton, 2021). Fewer than 500,000 students attended Title IV–eligible for-profits in the early 1990s compared to more than 2 million in 2010 (Goldstein & Eaton, 2021). Compared to all institutions, for-profit enrolment peaked in 2010 at 9.6% before falling to 5.0% by 2018 (Armona et al., 2022). Nearly one million students attended for-profit postsecondary institutions in 2018. In the 2018–2019 academic year, for-profit institutions conferred 9.8% (498,647) of all degrees granted. The proportion of for-profit universities in all

postsecondary enrolment increased from 5% to 12%, almost equal to private nonprofit institutions. Programs that prepare students for careers in business administration, graphic design, health care, and cosmetology saw the most growth (Goldstein & Eaton, 2021). However, when evidence mounted that businesses were utilizing dishonest hiring tactics to entice vulnerable students at exorbitant costs while offering little educational benefit, for-profit colleges also came under regulatory and public scrutiny. There is growing agreement that, on average, for-profit universities serving comparable student populations achieve much lower outcomes at a higher cost than nonprofit and public institutions, notwithstanding differences in their educational programs, attendance costs, and student outcomes (Armona et al., 2022). First-generation college students and members of underrepresented racial and ethnic groups are two groups that FPCUs frequently recruit and enroll (Baird et al., 2019). Additionally, women are more likely to enroll in FPCUs.

The U.S. government offers Pell Grants to students who need financial assistance for college. In contrast to loans, grants do not need repayment. The completion rates of Pell Grant recipients have raised some controversy at proprietary institutions. The percentage of undergraduates who receive Pell scholarships is the greatest at FPCUs,. Public 2-year colleges enrolled the fewest students (26%), public 4-year colleges had 53% of students receiving loans, and private 4-year colleges had 68% (Li & Kelchen, 2021). For-profit colleges also enrolled the highest percentage of students receiving federal loans (81%), compared to only 26% at public 2-year colleges. After several infamous college closures, including those of Trump University in 2010, Corinthian Colleges in 2015, and ITT Technical Institute in 2016, for-profit colleges have suffered (Guzman et al., 2021). Numerous lawsuits brought against these and other colleges not only called into question the caliber of education offered but also left many students with unfinished degrees and sizeable debt.

Failure to repay a debt in accordance with the terms outlined in the promissory note constitutes default. Loan defaults stem primarily from high-default educational institutions, frequently for-profit businesses (Yannelis & Tracey, 2022). The media and government are paying increasing attention to student loans. The size of the student loan market and its explosive expansion are two important factors. At $1.7 trillion in 2022, student loan balances are the second-largest source of household debt in the United States after mortgages. To put that into perspective, the outstanding sums on U.S. student loans are greater than either Brazil's or Russia's 2020 GDP (Yannelis & Tracey, 2022).

Transition

Section 1 contained the literature review, which provided a foundation for the research problem and questions. In Section 2, I will present the approach most suitable for the research by assessing the advantages of a pragmatic approach to research using a quantitative, correlational, multiple-regression analysis. In Section 3, I will discuss the findings, applications to professional practice, and implications for social change. I will conclude with recommendations for future research and my reflections on the doctoral study process.

Section 2: The Project

In Section 1, I provided information regarding the foundation of the study. Section 2 contains further details about the purpose of the study, why I chose to examine archival data, the research method and design, and the validation of the study. Section 2 also includes discussions about the role of the researcher, participants, population and sampling, ethical research, instrumentation, and data collection and analysis.

Purpose Statement

The purpose of this quantitative correlational study was to examine the predictive relationship between cohort default rates, 90/10 rule ratios, and gross revenue by institution size. The independent variables were cohort default rates and 90/10 rule ratios. The dependent variable was gross revenue by institution size. A ratio scale of measurement was applied to measure gross revenue by institution size for each institution included in the study. The amount of gross revenue was measured for institutions that fall within designated enrollment size brackets. The sample was 167 for-profit postsecondary Title IV institutions in California. The results of this study may contribute to social change by bringing awareness to for-profit postsecondary education industry leaders regarding impacts to Title IV funding eligibility, which may result in more access to higher education for nontraditional students.

Role of the Researcher

In a quantitative study, the researcher objectively collects and examines data (Faems, 2020). As a researcher, I collected and compiled data from public repositories, analyzed and assessed the data using a quantitative research method and correlation research design, answered the research question, and evaluated the study's hypotheses. Quantitative research aligns with general procedures used by the traditional scientific community (Bloomfield & Fisher, 2019). The

role of the researcher is to examine and analyze the data uncovered during the research (Apuke, 2017). When using human subjects in research, a researcher must adhere to ethical standards outlined in *The Belmont Report*, including respect, beneficence, and justice (Anabo et al., 2019). In accordance with *The Belmont Report* principles, researchers should protect the confidentiality of sensitive information (Renbarger et al., 2019). T. A. Williams and Shepherd (2017) noted that secondary data are less likely to be connected to the researcher when using quantitative research methodology.

The collected data came from 167 FPCUs with which I have no current affiliation. This distance limits any bias that may arise from a direct relationship. However, I have previously worked in the for-profit education industry. I was cognizant of my personal beliefs while exploring the strengths or weaknesses of the elements examined in the study.

As a former academic administrator for a for-profit postsecondary institution, I am aware of public archived data identified as measures linked to gross revenue. Therefore, I could identify relevant data for the study stored in the public repositories. The data compiled in these repositories include findings from prior research. I used a correlational multiple regression analysis to examine the predictive relationship between cohort default rates, 90/10 rule ratios, and gross revenue by institution size of FPCUs.

Participants

There were no participants for this quantitative correlation study, as the data were exclusively from archival data. I collected secondary data from publicly accessible repositories that provide data from U.S.-based postsecondary education institutions. I accessed NCES, IPEDS, and the NSLDS to collect information about cohort default rates, 90/10 rule metrics, and gross revenue by institution size from FPCUs. The NCES (2019) collects, analyzes, and publishes

comprehensive education statistical data for over 7,000 U.S. institutions. IPEDS serves as the central postsecondary education data collection repository for NCES. Data from IPEDS contain information for U.S. private, public, and proprietary colleges and universities. NSLDS is the core database housing student aid data obtained from schools and agencies that guarantee Title IV funding. Researchers at the U.S. GAO examined funding practices for proprietary and nonproprietary institutions using IPEDS, NSLDS, and NCES (Scott, 2009).

Research Method and Design

Researchers use three main methods when assessing scientific investigations: qualitative, quantitative, and mixed methods (T. A. Williams & Shepherd, 2017). Scholars investigate specific issues through the lens of a related research method to better conceptualize an in-depth understanding of the issue (Schoonenboom & Johnson, 2017). I used a quantitative correlational design to conduct the study and answer the research question. A quantitative approach is the most appropriate method to identify relationships between variables and predict outcomes (Apuke, 2017).

Research Method

I chose the quantitative methodology to examine the relationship between two independent variables and a dependent variable. A quantitative analysis focuses on stable patterns within the variables (Rutberg & Bouikidis, 2018). The quantitative researcher uses statistical data to examine the relationship between variables, predict outcomes, or identify cause and effect to generalize to a larger population (Roy et al., 2022). Because the goal of this study was to examine relationships between variables, the quantitative method was a better fit than alternative methods.

The qualitative method in research is useful for exploring data to understand a problem rather than assessing relationships between variables (Rutberg & Bouikidis, 2018). A qualitative researcher explores human behavior to explain a phenomenon and identify variables that effectuate an issue or problem (Stahl et al., 2019). Researchers use the qualitative method to gain insight into the impact of an issue on a specific population (Yin, 2018). Researchers conduct qualitative studies to encourage the respondent participation needed to explore behaviors (Gopalan et al., 2020). The purpose of this study was not to explore human behavior; instead, it was to examine the statistical relationship between variables. Therefore, the qualitative method was not appropriate for the study. The mixed methods research approach is used when the combination of qualitative and quantitative elements is required to collect, analyze, and interpret data to better understand the underlying phenomenon common to both (Schoonenboom & Johnson, 2017). Numerical data are collected, followed by interviews, surveys, or observations where participants provide feedback that explains the data (Young et al., 2021). Therefore, I did not choose qualitative or mixed methods methodology for this study. Because the study did not warrant a qualitative approach, the mixed methods approach was not appropriate.

Research Design

I used a correlational research design to determine whether a relationship exists between variables. Correlational research is a nonexperimental design where variables are not manipulated (Rutberg & Bouikidis, 2018). Researchers use correlational research to make predictions about the relationship between variables (Seeram, 2019). The objective of a correlational study is not to determine cause and effect but to identify whether a relationship does or does not exist between variables.

In a correlational study, the researcher examines the interdependence of two or more variables to determine if a relationship exists between the variables (Kasztelnik & Gaines, 2019). Furthermore, researchers use statistical data analysis in a correlational design to predict an outcome (Dearing & Zachrisson, 2019). The correlational design is appropriate for making observations to determine potential predictors; however, the design is not suitable for random assignment of conditions used to examine causality between variables (Adams et al., 2017). Therefore, the correlational design was appropriate for this study because I sought to predict the likelihood of a relationship between cohort default rates, 90/10 metrics, and gross revenue by institution size for FPCUs.

Researchers use causal-comparative designs to examine relationships between independent and dependent variables after an action has occurred (Adams et al., 2017). The causal-comparative design is appropriate when comparing two or more groups to determine the cause or reason for differences (Apuke, 2017). Therefore, the causal-comparative design was not suitable for the study because I did not compare any group to establish the reason for a phenomenon.

Population and Sampling

The goal of this study was to determine the predictive relationship between cohort default rates, 90/10 rule ratios, and gross revenue by institution size of FPCUs. I obtained the data from the FSA, NCES, IPEDS, and the NSLDS archived repositories. The population for this study consisted of 303 two-year and 4-year for-profit postsecondary Title IV degree-granting institutions. The focus of this study included a 3-year window from 2016 to 2018 of active accredited FPCUs. This time frame was appropriate, as it includes the most current data available for FPCUs that had 3 years of activity (U.S. DOE, 2021a). I removed institutions that were not

active for the entire 3-year period and used G*Power software to determine the sample size. A linear multiple regression statistical test with an alpha of 0.5, an effect size of 0.03, and a power of 0.80 was appropriate to identify the required sample size of FPCUs. G*Power indicated a minimum sample size of 87 (see Appendix A).

When conducting research, it is essential to determine an adequate sample size that accurately represents the population to ensure reliable and valid data (Bloomfield & Fisher, 2019). Probabilistic sampling is a random sampling technique that allows each member to have an equal opportunity for selection (Alzubaidi et al., 2021). The advantage of using probabilistic sampling is that it reduces bias when selecting participants (Berndt, 2020). There are four methods of probability sampling. (a) simple random sampling to randomly select participants from the target population, (b) stratified random sampling to randomly select participants from a target population divided into homogeneous subgroups, (c) systematic random sampling to randomly select subjects based on a specific count, and (d) cluster sampling to randomly select members from a specific cluster (Berndt, 2020). Some disadvantages to using probabilistic sampling are that it is more expensive and time-consuming than nonprobability sampling and is more complex due to a large population. Nonprobability sampling does not guarantee equal opportunities for participant selection (Berndt, 2020). To reduce bias, I employed a sampling method that affords equal opportunity for participant selection for the entire population without segmenting the participants or limiting the population to a specific count. Simple random sampling was the most appropriate method for this study.

Ethical Research

There were no participants in this study because I used archival data. The privacy of the institutions was inherent in the presentation of the secondary data, which displayed no institution

names. To ensure an ethical study, I obtained approval from Walden University's Institutional Review Board (IRB) before conducting any research. The anonymity of the participants in a study is always essential, as is ensuring the ethical protection of the participants. The data for this study are available publicly.

After I obtained the data, I entered them into a Microsoft Excel spreadsheet and used the Statistical Packages for Social Sciences (SPSS) for analysis. The data reside on my desktop computer, an external drive, and two backup jump drives. Only I can access these devices through an authentication code kept in my sole possession. The external hard drive and backup jump drives will remain in a fireproof, locked file cabinet in my home for 5 years.

Data Collection Instruments

I retrieved archival data from three core U.S. DOE postsecondary databases: the IPEDS (https://nces.ed.gov/ipeds/), the NCES (https://nces.ed.gov/), the NSLDS (https://nsldsfap.ed.gov/nslds_FAP/), and the Federal Student Aid Data Center (https://studentaid.gov/data-center). The U.S. DOE releases official cohort default rates, 90/10 rule compliance, and gross institutional revenue annually. The data are publicly accessible online from three U.S. DOE data repositories. The variables for this study included results from data submitted by the administrators of FPCUs to the national databases, information institutional leaders must update quarterly. I used an average for the entire 3-year period examined for each entity included in the sample.

Researchers use the scale of measure classification system to define the values of variables (Zumbo & Kroc, 2019). There are four scales of measurement: ordinal, ratio, nominal, and interval scales. Each measurement scale reflects specific characteristics that are determined based on how the variables will be used in the research analysis (M. N. Williams, 2021). I applied

an ordinal scale of measurement to measure 90/10 rule compliance and cohort default rate compliance. Ordinal scales are useful to label or classify measurements without a mathematical difference between scales (Allanson & Notar, 2020). In this study, I ranked the variables as 0 = *compliant* and 1 = *noncompliant*.

I applied a ratio scale of measurement to measure gross revenue by institution size for each institution included in the study. I measured the gross revenue for institutions that fell within specific enrollment size brackets. A ratio scale of measurement is the highest scale level used to complete complex statistical analysis. Ratio scales are appropriate to measure the order of variables, differentiate between the values of the scale, and include 0 as a starting point (Allanson & Notar, 2020). Therefore, a ratio scale of measurement was the most appropriate for me to apply to gross revenue by institution size.

Data Collection Technique

It is important to obtain accurate and reliable information when conducting research. Securing accurate data enables researchers to establish relationships between variables (Flake & Freid, 2020). There are several quantitative data collection methods, with surveys and secondary data among the most common (Faems, 2020). The data for this study were readily available through public repositories; thus, I used secondary data. Some advantages to using archival data include the following: (a) transparency: Data retrieved from publicly accessible data sources fosters research transparency; (b) time- and money-saving: Researchers have the benefit of accessing data already collected by primary researchers, which saves time and reduces the financial resources needed to obtain data; (c) high quality: Data retrieved from national databases compiled by multiple collaborative contributors are usually of higher quality when compared to research collected by individuals; and (d) greater external validity and more generalizability:

National data banks generally have large data sets available replete with documentation addressing the assessment design, data collection, and quality control, which facilitates greater external validity and allows for more generalizations of the data (Renbarger et al., 2019).

Despite the advantages of using secondary data, researchers must consider the following: (a) the technical skills necessary for accessing and analyzing data—for quantitative research, having a working understanding of statistics and how to use tools to extract data are essential; (b) when accessing large datasets, the processing speed of the computer may be reduced; and (c) the possibility of a gap between the time the data was made available and the in which the research was conducted (Renbarger et al., 2019). There were fewer than 5 years between the latest published cohort default rates (2016–2018) archival data and the present study. Pilot studies can be useful when conducting research to justify the research method when focusing on quantitative studies (Pearson et al., 2020). Because I extracted publicly accessible data from federal government repositories compiled from valid and reliable survey instrument measurements of cohort default rates, 90/10 rule metrics, and gross revenue, I did not conduct a pilot study.

I obtained approval from the Walden University IRB before conducting any research to ensure the protection of the institutions in this study. There was no need to conceal participants' identities, as the names of the institutions from which the secondary data has been collected were not included in the study. Thus, I achieved inherent anonymity for the data. I compiled the data in an Excel spreadsheet and transferred them to SPSS for analysis. Once analyzed, I stored the data on my laptop computer, an external drive, and a backup jump drive. I am the only person with access to the data on my laptop computer via an authentication code in my sole possession. I will retain the external and backup jump drives in a fireproof, locked file cabinet in my home for 5 years.

Data Analysis

I analyzed the data for this study to answer the following research question and test the hypotheses:

Research Question: What was the predictive relationship between cohort default rates, 90/10 rule ratios, and gross revenue by institution size?

The following hypotheses were derived from the research question:

H_0 There is no statistically significant predictive relationship between cohort default rates, 90/10 rule ratios, and gross revenue by institution size.

H_1 There is a statistically significant predictive relationship between cohort default rates, 90/10 rule ratios, and gross revenue by institution size.

I used a quantitative, correlational regression analysis to test the hypotheses and employed multiple linear regression to analyze the data. Multiple linear regression is useful to examine the relationship between the predictor variables and the dependent variable (Roy et al., 2022). Multiple linear regression analysis is a predictive model used to examine the relationship between the dependent variable and the independent variables where the outcome (dependent variable) is continuous (Rijnhart et al., 2019). Findings from this analysis helped to explain possible predictive relationships between the variables that proprietary postsecondary education business leaders can leverage to better manage gross revenue.

Researchers perform factor analysis to simplify data interpretation in regression models (Bojarian et al., 2019). There are only a few regulatory guidelines designed to combat fraud in higher education by imposing sanctions on Title IV federal funding against institutions that do not meet these specific compliance requirements (Riegg Cellini & Koedel, 2017). Two of the most

common regulatory compliance areas include cohort default rates and 90/10 rule metrics (Hawkins Fountain, 2019). Because of the limited number of variables in this study, factor analysis was not appropriate.

I considered conducting an ANOVA model. However, ANOVA is useful to compare the means of a categorical independent variable (Delacre et al., 2019). Because I did not compare such means, ANOVA was not appropriate for this study. I also considered binary logistic regression as the data analysis technique. Scholars use logistic regression when the outcome is binary (Gomila, 2021). My dependent variable was continuous with the possibility of infinite values; therefore, a binary logistic regression was not appropriate for data analysis.

To perform the analysis, I merged data corresponding to 303 California institutions from the IPEDS, the NCES, the NSLDS, and the Federal Student Aid Data Center. I excluded 136 institutions due to a lack of data for at least one of the study variables. After cleaning the data, I included 167 institutions in the analysis. No institutions had a 3-year average cohort default rate greater than 30% or a 3-year average 90/10 rule ratio greater than 90%. Therefore, I used the continuous values of cohort default rate and 90/10 rule ratio in the analysis.

Study Validity

This section presents the study's validity to substantiate the research. When conducting research, the method and design must align with the findings. The accuracy of the data supports the study's results (Flake & Freid, 2020).

Because this research was a quantitative correlational study with a nonexperimental design, threats to internal validity were not relevant. Similarly, there were no threats to external validity due to the use of archival data and no participants. When conducting a correlational study, researchers must consider threats to the validity of statistical conclusions. Statistical data

are the findings used to make inferences about the accuracy of relationships between variables when discussing statistical conclusion validity (Flake & Freid, 2020). Errors may result in conclusions about the relationship between variables when threats to statistical conclusion validity are present. The researcher may erroneously conclude that a relationship does or does not exist between variables when there is a lack of measurement information. The significance level should be minimized to mitigate against Type I errors, which occur if the null hypothesis is rejected when it is true in the population. A Type II error occurs if the null hypothesis is accepted when it is false in the population. Ensuring that the test has high statistical power mitigates Type II errors. Factors that impact the statistical conclusion validity include instrument reliability, data assumptions, and sample size. Researchers use a larger sample size to reduce the threat of statistical conclusion validity. I used G*Power to calculate the minimum sample size for this study.

Reliability of the Instrument

Reliability is a fundamental when evaluating measurement instruments in the research process. Instrument reliability occurs when the data obtained from a measurement instrument produces consistent results when evaluating specific variables multiple times (McNeish, 2018). Similar results should emerge each time the instrument measures the same variables. The internal consistency reliability test is a way to measure an instrument's ability to consistently produce comparable results (García-Ceberino et al., 2020). Cronbach's alpha is the most common internal consistency measure (Leppink, 2019). I employed reliability testing of this study's instruments—IPEDS, NCES, NSLDS, and FSA—using Cronbach's alpha. Cronbach's alpha typically varies between 0.0079 and 1.00, depending on how many items the scale includes; however, there has been an ongoing debate among researchers regarding the adequate size for Cronbach's alpha

(Leppink, 2019). Values above .90 are considered excellent,.80–.90 are good,.70–.80 are acceptable,.60–.70 are questionable, and less than .50 are poor (Leppink, 2019; McNeish, 2018).

Data Assumptions

Assumptions in multiple regression analysis validity include linear relationships, homoscedasticity, normality, and no multicollinearity (Green & Salkind, 2021). A linear relationship must exist between dependent and independent variables (Uttley, 2019). Homoscedasticity requires that the error variance is the same across the values of the independent variables. Mitigating linear relationships and homoscedasticity violations entails examining scatterplots of standardized residuals (Green & Salkind, 2021). Normality requires that errors between observed and predicted values be normally distributed (Uttley, 2019). A histogram was used to address normality violations (Green & Salkind, 2021). Multicollinearity occurs when the independent variables are highly correlated with each other (Uttley, 2019), as determined by examining the correlation coefficients of variables (Green & Salkind, 2021). I used bootstrapping with 1,000 samples to combat the influence of assumption violations.

Sample Size

Selecting an appropriate sample size is critical in the research process. A large sample size is required when using multiple regression models (Kwak & Kim, 2019). The sample should be representative of the population to increase the study validity and external validity. Statistical power is a measurement used to estimate the minimum sample size required for a study. Researchers perform a power analysis to determine the appropriate sample size for a study (Wang & Rhemtulla, 2021), and an inaccurate statistical power can lead to a misleading output. Power increases as the number of participants increases (Clayson et al., 2019). To conduct a power

analysis and minimize the threat to statistical conclusion validity, I calculated a sample size of 87 using G*Power (see Appendix A).

Transition and Summary

Section 2 contained an outline of the research method, design, and analysis for the present study. This quantitative correlational regression analysis entailed the use of only secondary data. The population consisted of U.S. proprietary institutions with 2 or more–year degrees. Section 3 will present the study's results, application to professional practice, and implications for social change. The section will conclude with recommendations for future research and reflections on the doctoral study process.

Section 3: Application to Professional Practice and Implications for Change

The purpose of this quantitative correlational study was to examine the predictive relationship between cohort default rates, 90/10 rule ratios, and gross revenue by institution size. The independent variables were cohort default rates and 90/10 rule ratios; the dependent variable was gross revenue by institution size. The null hypothesis was not rejected, and the alternative hypothesis was accepted. There was no significantly predictive relationship between cohort default rates, 90/10 rule ratios, and gross revenue by institution size.

Presentation of Findings

I employed bootstrapping with 1,000 samples to address the possible influence of assumption violations, presenting 95% confidence intervals where appropriate. I merged data corresponding to 303 California institutions from the IPEDS, the NCES, the NSLDS, and the Federal Student Aid Data Center to perform the analysis. After I excluded 136 institutions lacking data for at least one of the study variables, 167 institutions remained for analysis. No included institutions had a 3-year average cohort default rate greater than 30% or 3-year average 90/10 rule ratio greater than 90%. Therefore, I used the continuous values of cohort default rate and 90/10 rule ratio in the analysis.

Tests of Assumptions

I evaluated the assumptions of multicollinearity, outliers, normality, linearity, homoscedasticity, and independence of residuals. Bootstrapping, using 1,000 samples, enabled combating the influence of assumption violations.

Multicollinearity

I evaluated multicollinearity by viewing the correlation coefficients among the predictor variables. All bivariate correlations between the predictor variables were small; therefore, no

violation of the assumption of multicollinearity was evident. Table 2 presents the correlation coefficients for all study variables.

Table 2

Correlation Coefficients Among Study Variables

Variable	Cohort default rate	90/10 rule ratio	Gross revenue by institution size
Cohort default rate	-		
90/10 rule ratio	.26**	-	
Gross revenue by institution size	-.03	-.04	-

Note. $N = 167$. $^{**}p < .01$.

Outliers, Normality, Linearity, Homoscedasticity, and Independence of Residuals

I evaluated outliers, normality, linearity, homoscedasticity, and independence of residuals by examining the normal probability plot (P-P) of the regression standardized residual (see Figure 1) and the scatterplot of the standardized residuals (see Figure 2). The examinations indicated there were violations of these assumptions. The points in the normal P-P plot did not follow the diagonal, showing the assumption of normality was violated (see Nawala et al., 2020). Additionally, outliers appeared in the scatterplot of the standardized residuals. A closer examination of the variables showed that institution size and gross revenue were highly skewed. A natural log transformation of the variable alleviated the skewness and corrected the assumptions violations. However, the regression results did not change after applying the transformation. To aid in interpretation, I reported the regression results for the untransformed variable. Bootstrapping using 1,000 samples occurred to combat any possible influence of

assumption violations, with 95% confidence intervals based upon the bootstrap samples reported for the regression.

Figure 1

Normal Probability Plot (P-P) of the Regression Standardized Residuals

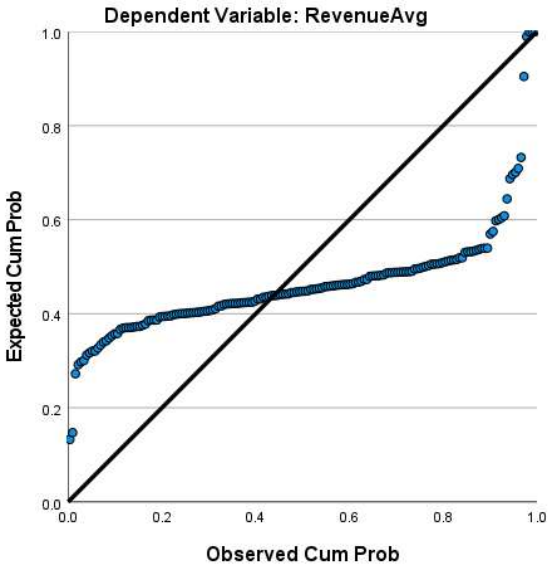
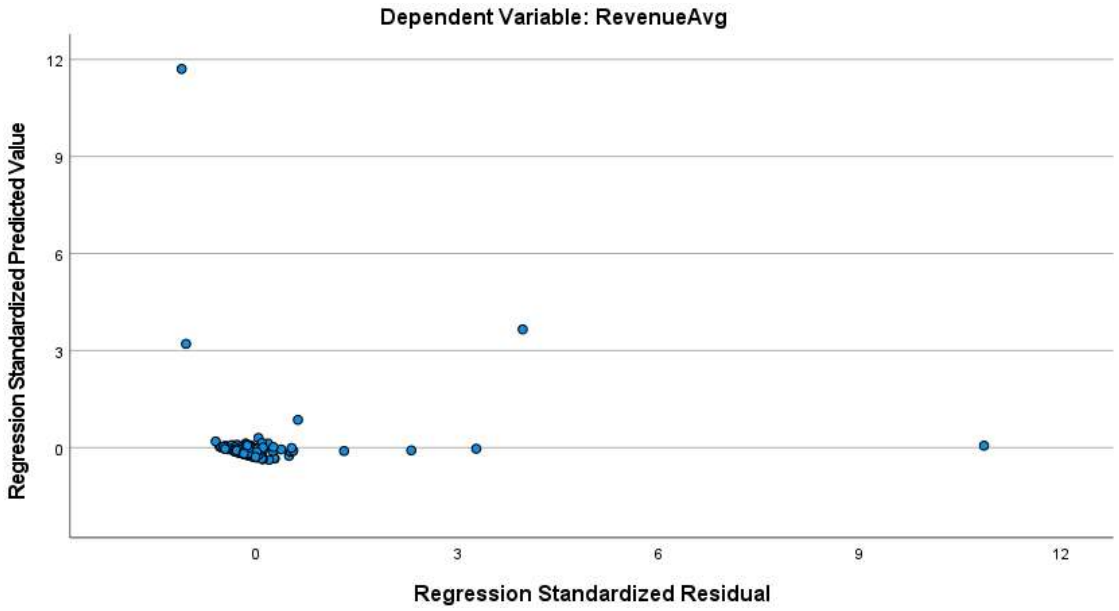


Figure 2

Scatterplot of the Standardized Residuals



Descriptive Statistics

Table 3 presents descriptive statistics for the study variables, including 95% confidence intervals based on 1,000 bootstrapped samples. The average gross revenue by institution size was approximately $25,203 per student enrolled (*SD* = 53,370). The 3-year average cohort default rate was approximately 9% (*SD* = 5.79), and the average 90/10 rule ratio was 66.49% (*SD* = 18.13).

Table 3

Means and Standard Deviations for Quantitative Study Variables

Variable	*M*	*SD*	95% CI (*M*)
Cohort default rate	9	6	[8, 10]
90/10 rule ratio	67	18	[64, 69]
Gross revenue by institution size	25,203	53,370	[18,855, 34,320]

Notes. $N = 167$. 95% confidence intervals based on 1,000 bootstrapped samples.

Inferential Results

Standard multiple linear regression, $\alpha = .05$, was used to examine the efficacy of cohort default rates and 90/10 rule ratios in predicting gross revenue by institution size. The independent variables were cohort default rates and 90/10 rule ratios, and the dependent variable was gross revenue by institution size. The null hypothesis was that there was no significantly predictive relationship between cohort default rates, 90/10 rule ratios, and gross revenue by institution size. The alternative hypothesis was that there is a significantly predictive relationship between cohort default rates, 90/10 rule ratios, and gross revenue by institution size. I conducted preliminary analyses to assess whether the assumptions of multicollinearity, outliers, normality, linearity, homoscedasticity, and independence of residuals were met. I noted no violations and actions taken in response to the violations, as indicated in the Tests of Assumptions subsection.

The overall model was not significant, $F(2, 164) = 0.94$, $p = .394$, $R^2 = .01$. The R^2 (.01) value indicated that approximately 1% of variation in gross revenue by institution size was accounted for by the linear combination of the predictor variables (cohort default rate and 90/10 rule ratio). In the model, cohort default rate was not a statistically significant predictor of gross revenue ($\beta = -.07$, $p = .366$), and 90/10 rule ratio was not a statistically significant predictor of

gross revenue (β = -.06, p = .448). Therefore, the null hypothesis was not rejected. Table 4 shows the complete results for the predictors. The final predictive equation was as follows:

Gross revenue by institution size = 43204 - 671(cohort default rate)

- 180(90/10 rule ratio)

Table 4

Regression Coefficients for Predictors of Gross Revenue by Institution Size

Predictor	*B*	*SE*	β'	*t*	Sig.	95% CI (*B*)
(Constant)	43,204	21,473		2.71	.008	[13,679, 94,883]
Cohort default rate	-671	715	-0.07	-0.91	.366	[-2,422, 257]
90/10 rule ratio	-180	184	-0.06	-0.76	.448	[-620, 88]

Note. N = 167. 95% confidence intervals based on 1,000 bootstrapped samples.

Cohort Default Rates

Cohort default rate was not a statistically significant predictor of gross revenue by institution size in the regression model (β = -.07, p = .366). This result indicates that cohort default rates do not effectively predict gross revenue by institution size.

90/10 Rule Ratios

The 90/10 rule ratio was not a statistically significant predictor of gross revenue by institution size in the regression model (β = -.06, p = .448). This result indicates that 90/10 rule ratios do not effectively predict gross revenue by institution size.

Analysis Summary

The purpose of this study was to examine the efficacy of cohort default rates and 90/10 rule ratios as predictors of gross revenue by institution size. I used standard multiple linear

regression to examine the ability of cohort default rates and 90/10 rule ratios to predict gross revenue by institution size. Institution size was determined from the enrollment numbers (total enrollment) in the NCES data files. For each institution, the total enrollment was averaged across the 3 years under investigation (2016, 2017, and 2018) to create a 3-year average enrollment, which served as the measure of institution size. The 3-year average gross revenue was divided by the 3-year average enrollment to calculate the gross revenue by institution size. Assumptions surrounding multiple regression were assessed, and violations were noted. The model as a whole could not significantly predict gross revenue by institution size, $F(2, 164) = 0.94$, $p = .394$, $R^2 = .01$. The federal government uses the 90/10 rule ratio and cohort default rates to regulate Title IV funding eligibility (Looney & Yannelis, 2019; Ward, 2019); however, in this study, neither cohort default rates nor 90/10 rule ratios statistically significantly predicted gross revenue by institution size. The conclusion from this analysis is that cohort default rates and 90/10 rule rations were not effective predictors of gross revenue by institution size in this sample of institutions. The null hypothesis was not rejected, and the alternative hypothesis was not supported.

Applications to Professional Practice

The results of this study may be valuable to business leaders in the proprietary postsecondary education business sector. A significant role for business leaders is to manage revenue (Hawkins Fountain, 2019). Among leaders in the proprietary postsecondary education sector, revenue is often directly related to the institution's ability to receive Title IV funding (Looney & Yannelis, 2019; Ward, 2019). Therefore, proprietary postsecondary education leaders seek to make decisions that influence positive Title IV eligibility factors. This study is significant to business practices because the findings show that although the predictor variables—cohort default rates and 90/10 rule ratios—must meet specific federal compliance, they were not

effective predictors of gross revenue. Therefore, these variables can be excluded, and other potential predictive factors can be analyzed.

Implications for Social Change

The implications for positive social change include the possibility of increasing access to higher education. The findings from this study may assist proprietary postsecondary education leaders in reducing the risk of noncompliance with federal regulations. Minimizing noncompliance may help postsecondary education institutions maintain Title IV funding, thus increasing access to education within the community. Furthermore, increased access to higher levels of education has been linked to poverty reduction (Abaidoo, 2021). Access to education has also been linked to crime reduction and inequality reduction (Anser et al., 2020). Therefore, by equipping higher education leaders with information to assist with maintaining federal Title IV funding, poverty, crime, and inequality could be reduced.

Recommendations for Action

Based on the findings from this study, cohort default rates and 90/10 rule ratios are not significant predictors of gross revenue. Therefore, proprietary postsecondary education leaders must find alternative ways to impact gross revenue. A recommendation for action is for proprietary postsecondary education institutional leaders to explore revenue diversification methods that may impact gross revenue. Revenue diversification could be possible through instructional initiatives, pricing initiatives, partnerships, and real estate initiatives.

Instructional initiatives may include lifelong learning programs, workforce training, online education, and test preparation courses. An example of a pricing initiative is to differentiate tuition fees. Partnerships can include franchising opportunities, licensing, and sponsorships. An example of real estate initiatives would be facility rental. Exploring revenue

diversification methods can allow proprietary postsecondary education institutional leaders to think critically about potential action plans that may lead to increased gross revenue.

Recommendations for Further Research

I propose two recommendations for further research. A key limitation of this study was the inherent weakness of using archival data. In an archival design, the researcher does not control the primary data collection process using the archived data. Relying on secondary data creates limitations related to the cost and availability of data (Smyth et al., 2018). For this study, current-year data were unavailable at the time of the analysis. Therefore, I would recommend future researchers collect primary data directly from the sample population to use the most current data in the study.

The for-profit postsecondary education sector receives 70% of its total revenue through Title IV student aid (Riegg Cellini & Koedel, 2017). In this study, the predictor variables, cohort default rates and 90/10 rule ratios, did not significantly impact the dependent variable, gross revenue. However, other factors may impact gross revenue. Therefore, a second recommendation would be to conduct the study with alternative predictor variables, such as student retention, graduation, and job placement rates.

Reflections

My experience in the doctoral study process has been long and arduous. I began this journey intrinsically motivated to become the first person in my family to hold a doctoral degree. I wanted to set an example for my children and establish a legacy of academic excellence for my family. There were several points along the way when I simply wanted to give up. Thankfully, my children served as an extrinsic motivation to keep pushing forward.

My objective for completing this quantitative correlational study was to examine a significant concern for the industry I was working in at the start of my DBA journey. For-profit postsecondary education institutions were under fire from consumers, the government, and the news media. Several large institutions were forced to close their doors due to noncompliance with federal regulations that governed access to Title IV funding, the largest source of revenue for private higher education institutions. Ways to mitigate noncompliance was a daily discussion. I wanted to further explore factors that may impact revenue.

Through this process, I have learned how to think more critically and express ideas with synergy. I have enhanced my knowledge of the issues specific to private higher education institutions, and I am better able to participate in discussions that bring awareness to the issues. I am now equipped with the knowledge and skills as a researcher to investigate the topic further and consult with organizational leaders to find resolutions for this problem.

Conclusion

Attempts to regulate the proprietary postsecondary education business sector date back to the 1992 amendments to the HEA (Riegg Cellini & Turner, 2019). Leaders and legislators in the federal government seek to address these concerns with regulations. FPCUs will no longer qualify for Title IV funds if they do not meet minimum cohort default rates and 90/10 rule ratios. I used secondary data from publicly accessible government repositories to examine the likelihood of cohort default rates and 90/10 rule ratios predicting gross revenue by institution size. Data from IPEDS contain information for U.S. private, public, and proprietary colleges and universities. Researchers at the U.S. GAO examine funding practices for proprietary and not-proprietary institutions using FSA, IPEDS, NSLDS, and NCES (Scott, 2009). I chose to use FSA, IPEDS, NSLDS, and NCES data repositories for this study because of the reliability and ease of access.

This study found that cohort default rates and 90/10 rule rations were not effective predictors of gross revenue by institution size in this sample of institutions. The null hypothesis was not rejected, and the alternative hypothesis was not supported.

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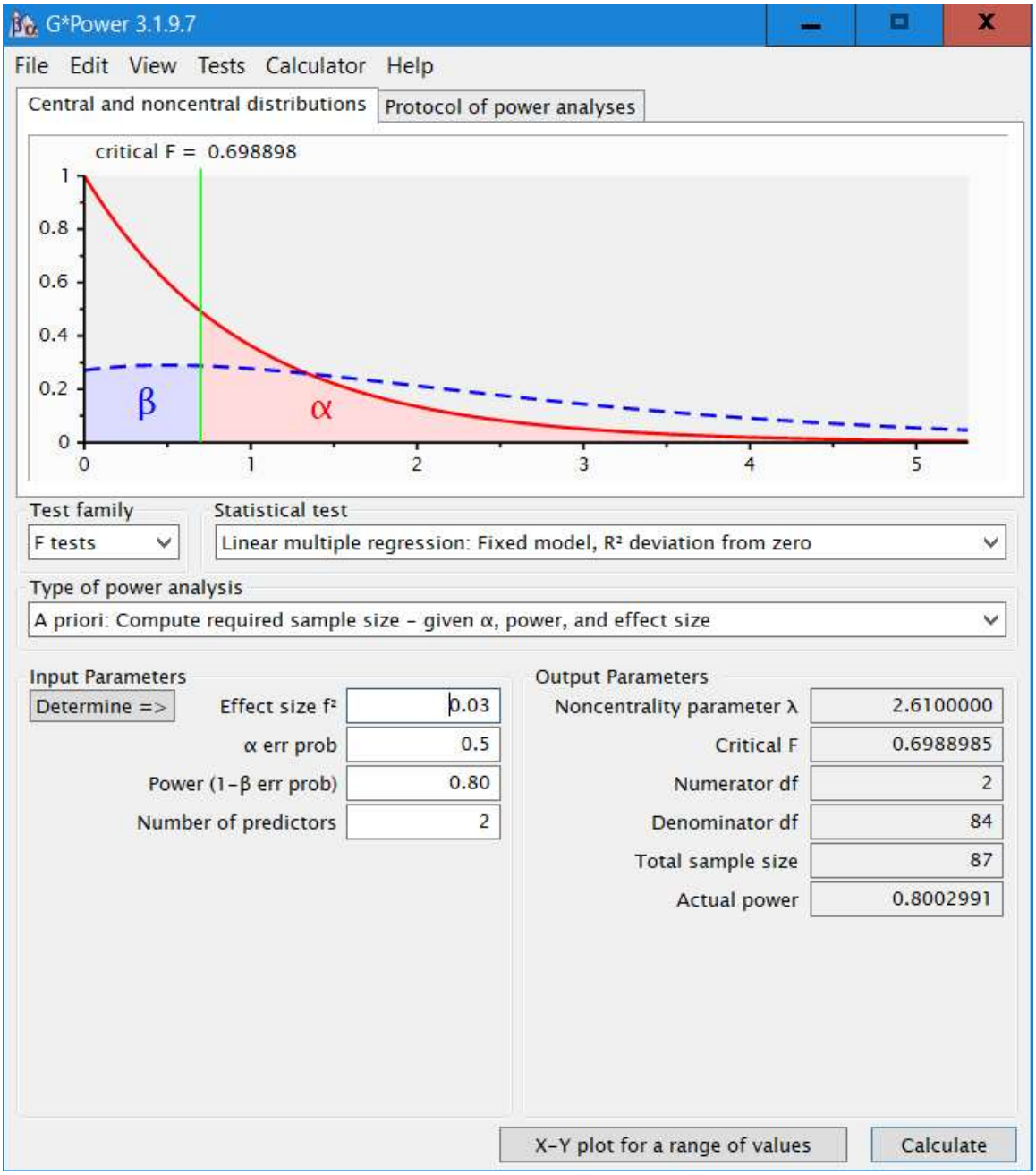
Appendix A: G*Power Graph



Appendix B: Cohort Default Rates

The information was obtained from

https://www2.ed.gov/offices/OSFAP/defaultmanagement/cdr.html in the public domain.

Appendix C: 90/10 Revenue Percentages

The information was obtained from https://studentaid.gov/data-center/school/proprietary in the public domain.

Appendix D: Revenue

The information was obtained from https://studentaid.gov/data-center/school/proprietary in the public domain.

Appendix E: Degree-Granting Postsecondary Institutions Closed Since 2015

The information was obtained from

https://nces.ed.gov/programs/digest/d19/tables/dt19_317.50.asp in the public domain.

Appendix F: Number of Postsecondary Institutions

The information was obtained from https://nces.ed.gov/programs/digest/d19/tables/dt19_317.30.asp for nondegree-granting institutions for fall 2018 enrollment and from https://nces.ed.gov/programs/digest/d19/tables/dt19_317.40.asp for degree-granting institutions for fall 2018 enrollment in the public domain.

Appendix G: Institution Size

The information was obtained from

https://nces.ed.gov/ipeds/datacenter/InstitutionByName.aspx in the public domain.