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Performance Based Funding and the Florida State University System: An Exploratory Analysis

Laura A. Hoffman
University of South Florida

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by

Laura A. Hoffman

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Major Professor: Liliana Rodriguez-Campos, Ph.D.
Amber Dumford, Ph.D.
Robert Dedrick, Ph.D.
John Ferron, Ph.D.

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ABSTRACT

Higher education funding models based on performance have seen a resurgence over the last decade. These models, known as performance-based funding (PBF) 2.0, hold institutions accountable to outcome metrics such retention and graduation rates through the incentive of increased funding and the threat of funding cuts. This quantitative, exploratory study examined data from the Florida State University System (FLSUS) coincident to the years prior to and after the implementation of the Florida PBF policy. The primary purpose of the study was to examine what changes, if any, occurred regarding student access to or success within the FLSUS coincident to PBF implementation. The study was focused on the following groups of data (a) outcome metrics, 6-year graduation rate and 1st-year retention rate, (b) access metrics, (c) student demographic characteristics, and (d) institutional characteristics.

With a note that this study is not designed to imply causation, the following list represents the most prominent results from each data grouping: (a) The outcome metrics, graduation and retention rates, showed an upward trend at the FLSUS-level both prior to and after PBF implementation. All 10 of the FLSUS institutions had higher 6-year graduation rates in the most recent cohort under study when compared to the year prior to PBF implementation. All but one institution had a higher 1st-year retention rate. (b) In the year prior to PBF implementation only two FLSUS institutions had an average high school weighted GPA of entering students at or above 4.00. In the most recently reported cohort year, 2016, 6 of the 10 institutions had a GPA at or above 4.00. (c) The enrollment of Pell Grant recipients decreased at 7 of the 10 FLSUS institutions when the year prior to PBF implementation, 2012, is compared to

the most recent reporting year, 2017. (d) Institutions classified Very High Research by Carnegie Classification showed a strong, positive, significant association between 1st-year retention rates and the access metrics GPA and SAT scores. These associations were weaker and nonsignificant for institutions categorized as High Research or lower by Carnegie Classification.

CHAPTER I:
INTRODUCTION

For nearly forty years, state governments have experimented with funding models for higher education (McLendon & Hearn, 2013). Over the past decade, these models have evolved from funding based on student enrollments to tying state budget allocations to the performance of institutions on specific outcomes (Hillman, 2016). This new era of accountability emphasizes effectiveness and efficiency in higher education and is measured by institutional performance on metrics such as retention and graduation rates (Hearn, 2015). According to a 2019 study by HCM Strategists (Boelscher & Snyder, 2019), 37 states have some form of higher education performance accountability policy either already in process, being implemented, or being developed for either two-year institutions, four-year institutions or both.

Dougherty and Reddy (2013) described performance funding in two different forms, 1.0 and 2.0. The first phase, 1.0, constitutes the first wave of accountability policies that tied funding to performance. Some states moved to 100% budget allocation based on performance, for example South Carolina, while others moved to provide bonus dollars to institutions. Many of these 1.0 policies were abandoned at the turn of the century (Hillman, 2016). A decade later the policies began to re-emerge, backed by powerful support from organizations like the Bill and Melinda Gates Foundation and the Lumina Foundation, this more recent wave is referred to as "Performance Funding 2.0" (Tandberg & Hillman, 2014).

In 2012, the Florida State Legislature enacted performance budgeting with an intent of providing bonus funding to the universities of the Florida State University System (FLSUS) that

ranked highest on chosen metrics. Two years later, falling in line with the 2.0 wave, they moved the model from a hold harmless, bonus system to one in which base funding could be lost (Florida Board of Governors, 2014). Closing out its sixth cycle in June of 2019, the data is now available to examine the influence of this policy on access to the FLSUS institutions and the success of students who attend those institutions.

Statement of the Problem

According to Thelin (2011), American higher education entered its golden era between 1945 and 1970. Enrollment dramatically increased at the same time research capacity expanded. During this period, American higher education fortified its venerated reputation nationally and globally. By 1970, however, American higher education had overextended itself in both its budgets and its programming. To reign in the bloated system, external oversight by the federal government and organizations such as the Carnegie Commissions commenced. At the same time the American economy was suffering high unemployment and inflation (Shumway, 2017) and the political landscape was being rewritten to adhere to neoliberal principals of market driven economies and the downsizing of government, including government sponsored higher education (Thelin, 2011).

This narrative has continued into the 21st century. Many accuse higher education of not being accountable to the public at large and for failing to keep pace with the world in producing needed graduates. Complete College America (2013), backed by the Lumina Foundation, wrote the following:

> Devastating realities about our current higher education system have been uncovered. Despite much progress in increasing access to colleges and universities, the system has

> failed to increase student success. The result: American higher education costs too much, takes too long, and graduates too few (p. 3).

The solution, as Complete College America (2013) and other groups assert, is to tie the performance of these institutions to their funding.

However, an opposing view is also prevalent in the literature. Scott, Bailey, and Kienzl (2006) explain:

> Assessment of institutional performance can be a difficult and complex task. This is especially true for public colleges, with their clear mandate of access to underrepresented communities. Colleges that enroll many poorly prepared students or students who are working or have family or financial responsibilities that compete with college are likely to have lower graduation rates. Thus, greater selectivity may improve measured performance, but comes into conflict with the public mission of the colleges (p.250).

Of most concern is that the research has found PBF to have little significant effect on improving student outcomes (Hillman, Tandberg, & Fryar, 2015; Hillman, Tandberg, & Gross, 2014) at the same it has shown that the focus on outcome metrics can adversely affect student access to higher education because higher selectivity is an efficient method of producing the required outcomes (Rhoades, 2012).

Purpose of the Study

The purpose of this study is to determine what changes if any occurred regarding student access to and success within the FLSUS coincident to the implementation of PBF. Specifically, this study focuses on the access of underrepresented minorities and students from lower socioeconomic backgrounds to FLSUS institutions. Additionally, the analysis of the data focuses on any differences between the FLSUS institutions regarding their access rates and how they

relate to their individual institutional success rates, as measured by the 1st-year retention rate. It should be noted that the non-experimental design of this study precludes the interpretation of any results to infer causation by the implementation of PBF.

Research Questions

The research questions were formulated to explore the trends in the data at both the individual FLSUS institution and at the aggregate FLSUS level. This study employs quantitative methods and graphical techniques to answer the following questions:

I. Coincident with the years before and after the implementation of PBF, what are the trends in the outcome metrics, access metrics, and student demographic characteristics
    a. at the FLSUS-level and
    b. at the FLSUS institution-level?

II. Coincident with the years before and after the implementation of PBF, what is the relationship between 1st-year retention rate and the access metrics and student demographic characteristics?

III. If the FLSUS institutions are divided into groups based on their institutional characteristics, is there a difference between the relationships of 1st-year retention rate and the access metrics and student demographic characteristics for each group?

IV. What is the average growth in 1st-year retention rates and 6-year graduation rates coincident to the years before and after implementation of PBF?

Significance of the Study

To ensure significance of this study, gaps in the literature were investigated. Two main areas for additional research were identified. First, further investigation into the effects of Performance Funding 2.0 is needed because of its recent implementation (Dougherty, Jones, Lahr, Natow, Pheatt, & Reddy, 2016; Rutherford & Rabovsky, 2014; Tandberg & Hillman, 2014). Second, a significant focus on the unintended consequences of PBF, specifically impacts on access to higher education by underrepresented and lower socioeconomic groups, have gone largely un-studied (Kelchen & Stedrak, 2016).

Additionally, institutional-level context has been largely unexamined although differences at the institutional level were discussed. For example, Cornelius and Cavanaugh (2016) in their review of the Florida performance system found the policy had created a structure, inadvertently or not, that worked well for the large research institutions but put the smaller institutions into constant fiscal threat. Table 1 supports this conclusion showing five of the eleven FLSUS schools received 83% of available PBF funds since 2014-15.

The information gleaned from the study will be informative to lawmakers in Florida and in other states considering moving to this type of funding structure. Importantly, this study focuses not only on the macro-level outcomes for the entire FLSUS, it gives attention to the specific student groups and the individual institutions within the FLSUS. The PBF literature offers numerous accounts of unintended consequences for these groups (Black, Cortes, & Lincove, 2016; Hillman & Corral, 2018; Jones, Jones, Elliott, Owens, Assalone, & Gandara, 2017; Kelchen, 2018; and Umbricht, Fernandez & Ortagus, 2015).

Table 1

Florida Board of Governor's (FLBOG) PBF Allocations

University	Total Allocation of Funds Since (2014-15 to 2017-18)	Percent of Total Allocation of Funds
University of Florida	$156,634,914	22%
University of South Florida	$119,221,467	17%
University of Central Florida	$115,580,494	16%
Florida State University	$115,494,947	16%
Florida International University	$82,886,110	12%
Florida Atlantic University	$56,108,070	8%
University of West Florida	$26,846,291	4%
Florida Agricultural & Mechanical University	$17,050,813	2%
Florida Gulf Coast University	$16,248,906	2%
University of North Florida	$11,458,452	2%
New College of Florida	$2,469,535	0%

Note: Funds calculated using FLBOG posting of yearly performance funding allocations retrieved from http://flbog.edu

According to Bradley and Doran (2019), legislators must pay close attention to the impacts PBF has on marginalized groups, such as students of color and those from lower socioeconomic backgrounds while developing PBF policies and during their implementation.

Florida offers a prime opportunity to study the trends in the data surrounding the years prior to and after the implementation of Performance Funding 2.0. The limited number of universities under review provides the opportunity to conduct an exploratory analysis of how the FLSUS is changing under or in reaction to the policy, although causation is not implied. Florida is also a well-suited for an analysis of this type because it has a historically black institution, FAMU, and

three Hispanic Serving Institutions, UCF, FAU, and FIU. Although it should be noted that UCF earned their designation in 2019, outside of the timeframe of this study and thus is not considered a Minority Serving Institution for the purposes of this study. Socioeconomic differences are also prevalent as nearly 40% of FLSUS undergraduates received a Pell Grant in Fall Semester 2015 (Florida Board of Governors, 2018).

Definitions

Bachelor's degree – According to the IPEDS Glossary (National Center for Education Statistics, 2018), "an award (baccalaureate or equivalent degree, as determined by the Secretary, U.S. Department of Education) that normally requires at least 4 but not more than 5 years of full-time equivalent college-level work. This includes all bachelor's degrees conferred in a 5-year cooperative (work-study) program. A cooperative plan provides for alternate class attendance and employment in business, industry, or government; thus, it allows students to combine actual work experience with their college studies. Also includes bachelor's degrees in which the normal 4 years of work are completed in 3 years" (p. 4).

Educational Expenditure – Core expenses for public institutions including research, public service, academic support, student services, institutional support, operation and maintenance of the plant, depreciation, scholarships, and fellowships, interest and other operating and non-operating expenses. (National Center for Education Statistics, 2018, p.8).

FTE – Full-time Equivalent based on the IPEDS definition for students calculated using credit hours over a 12-month enrollment period. One undergraduate FTE is equivalent to 30 credit hours. (National Center for Education Statistics, 2018, p.5).

FTIC – A student who has no prior postsecondary experience attending any institution for the first time at the undergraduate level. It includes students enrolled in the fall term who attended

college for the first time in the prior summer term, and students who entered with advanced standing (college credits or postsecondary formal award earned before graduation from high school). (National Center for Education Statistics, 2018, p.13).

Graduation Rate – The number of students entering the institution as full-time, first-time, degree/certificate-seeking undergraduate students in a particular year (cohort) completing their program within 150 percent of normal time to complete (National Center for Education Statistics, 2018, p.15).

Performance Based Funding (PBF) – State-level policy of higher education budget allocation tied to university outcomes based on designated indicators (Burke & Modaressi, 2000).

Pell Grant Program - Provides grant assistance to eligible undergraduate postsecondary students with demonstrated financial need to help meet education expenses (National Center for Education Statistics, 2018, p. 24).

Retention Rate - A measure of the rate at which students persist in their educational program at an institution, expressed as a percentage. For four-year institutions, this is the percentage of first-time bachelors (or equivalent) degree-seeking undergraduates from the previous fall who are again enrolled in the current fall. For all other institutions this is the percentage of first-time degree/certificate-seeking students from the previous fall who either re-enrolled or successfully completed their program by the current fall (National Center for Education Statistics, 2018, p.28).

Underrepresented Groups – Subgroups of the population that hold a smaller proportion of the population in higher education than they do in the general public. Specific to this study are African Americans, Hispanics, and lower socio-economic status students.

Delimitations and Limitations

This study was limited to 10 of the 12 public, masters or doctoral degree granting institutions within FLSUS. Two institutions within the FLSUS were excluded from the study. Florida Polytechnic because it did not participate in PBF during the study years and New College of Florida because of its small size and limited mission as an honors college. By focusing solely on Florida, validity of the study is lessened for generalizations to other states and types of institutions.

The source of the data for this study is the Integrated Postsecondary Education Data System (IPEDS). Although considered the standard bearer for comparable higher education data, IPEDS is limited in the way it has historically calculated graduation and retention rates, restricting the cohorts to only full-time, first-time students who enter in the fall or in the summer and continue into the fall. Additionally, IPEDS surveys have not remained static over the years, therefore not all data were available for all time periods.

Organization of the Study

This study is divided into five chapters. Chapter I serves as an introduction to the topic of PBF and the FLSUS. Additionally, a description of the research is provided. Chapter II provides a review of literature related to performance-based funding, including drivers leading to enactment of the policy and the intended and unintended consequences of the policy. Chapter III is an overview of the research methods. Chapter IV provides a presentation of the results from the data analysis. Chapter V discusses the results, the implications of the results, and suggestions for future research.

CHAPTER II:

LITERATURE REVIEW

A review of the literature was performed to explore studies that have been conducted in relation to PBF. In this chapter, a history of PBF nationally and Florida's PBF model are discussed. An overview of the literature related to the impacts of PBF is also presented with an emphasis on impacts for certain student groups and types of institutions. Lastly, a discussion of the theoretical basis that provides the conceptual framework for the study is given.

History of Performance Funding in the United States

Performance funding in higher education was first adopted by Tennessee in 1979 under what is known as the Performance Funding 1.0 model (Dougherty & Reddy, 2013). According to Dougherty and Reddy (2013), the 1.0 model provided funding above and beyond the regular base budget funding levels in the form of bonuses. Typical metrics included increasing the enrollment of specific groups, degrees awarded, graduation rates, employment rates, and exam licensure passing rates. Joseph C. Burke (2002) highlights the following as reasons the funding model was attractive to proponents:

> 1) it featured twin goals of external accountability and institutional improvement, 2) it focused on a set of performance indicators that were varied in scope but limited in number, 3) it specified a phased implementation and periodic reviews afterward, 4) it stressed institutional improvement over time, 5) it provided limited but still significant supplementary funding for institutions, and 6) it maintained reasonable stability in its priorities and program requirements (as cited in McLendon & Hearn, 2013, para. 8)

Between the initial adoption of the 1.0 model in Tennessee in 1979 and the year 2000, thirty-five states attempted to implement some form of the performance funding model (McKeown-Moak, 2013). The early 2000s signified the demise of the 1.0 model. Because of falling state revenues many legislatures abandoned the practice of providing performance-based bonus incentives to institutions (Harnisch, 2011). As the decade progressed and the United States slid further into a recession, overall funding of higher education institutions was slashed. This was at a time when enrollments in these institutions was also growing rapidly. The result was tremendous pressure on the budgets of colleges and universities (Mckeown-Moak, 2013). Under these extreme financial conditions, Performance Funding 2.0 was introduced (McLendon & Hearn, 2013).

Performance Funding 2.0 most significantly differs from the 1.0 model in how it prescribes the allocations of funding. Previously, under the old model, institutions were held harmless, receiving an incentive to improve but no punishment if they failed to do so (Dougherty & Reddy, 2013). In contrast, the 2.0 models, as Harnisch (2011) explains, follow the theory of resource dependence. Higher education would no longer be held harmless and instead could face further budget cuts if unable to compete under the established metrics. Thus, the stakes are much higher. Harnisch (2011) clarifies, "because the leaders of public colleges and universities are significantly dependent on state appropriations, the theory postulates that they will take the measures necessary to retain or enhance their institution's funding" (p.2).

Performance Funding 2.0, according to McKeown-Moak (2013), also shifted focus away from the institution and toward the student and the community. The authors point to measures of student success that are aligned with state and local community needs. For instance, not only are there metrics that measure the length of time a First-Time-in-College (FTIC) student takes to

earn a degree, the new metrics also focus on completions including certificates, degrees and other credentials in areas that align with workforce needs. In all, performance-based funding under the 2.0 model looks at intermediate as well as long-term outcomes. Dougherty et al (2016) found great support for PBF from entities such the U.S. Department of Education to the National Governors Association to private foundations such as Lumina Foundation. This support may be causal to the widespread adoption of PBF over the past decade.

Presently, PBF models and their implementations are still in flux; however, according to the Boelscher and Snyder (2019) twenty-nine states— Alabama, Arkansas, California, Colorado, Florida, Hawaii, Illinois, Indiana, Kansas, Kentucky, Louisiana, Maine, Michigan, Montana, New Mexico, New York, Nevada, North Carolina, North Dakota, Ohio, Oregon, Rhode Island, Tennessee, Texas, Utah, Virginia, Washington, Wisconsin, and Wyoming—implemented their funding formula in fiscal year 2019. Eight states—Arizona, Georgia, Iowa, Kansas, Louisiana, Mississippi, Oklahoma, and South Dakota —are currently transitioning to some type of performance funding, meaning the legislature or governing board has approved a performance funding program but they were not implemented in fiscal year 2019. Two states – Idaho and West Virginia – were in the process of developing a performance funding policy in fiscal year 2019. Five states – Massachusetts, Minnesota, Mississippi, Missouri, and Oklahoma had developed policies but were not implementing. Pennsylvania was in the process of developing and implementing their policy. Thirteen states - Alaska, Arizona, Connecticut, Delaware, Georgia, Iowa, Maryland, Nebraska, New Hampshire, New Jersey, South Carolina, South Dakota, and Vermont– did not have a performance funding policy in place in fiscal year 2019.

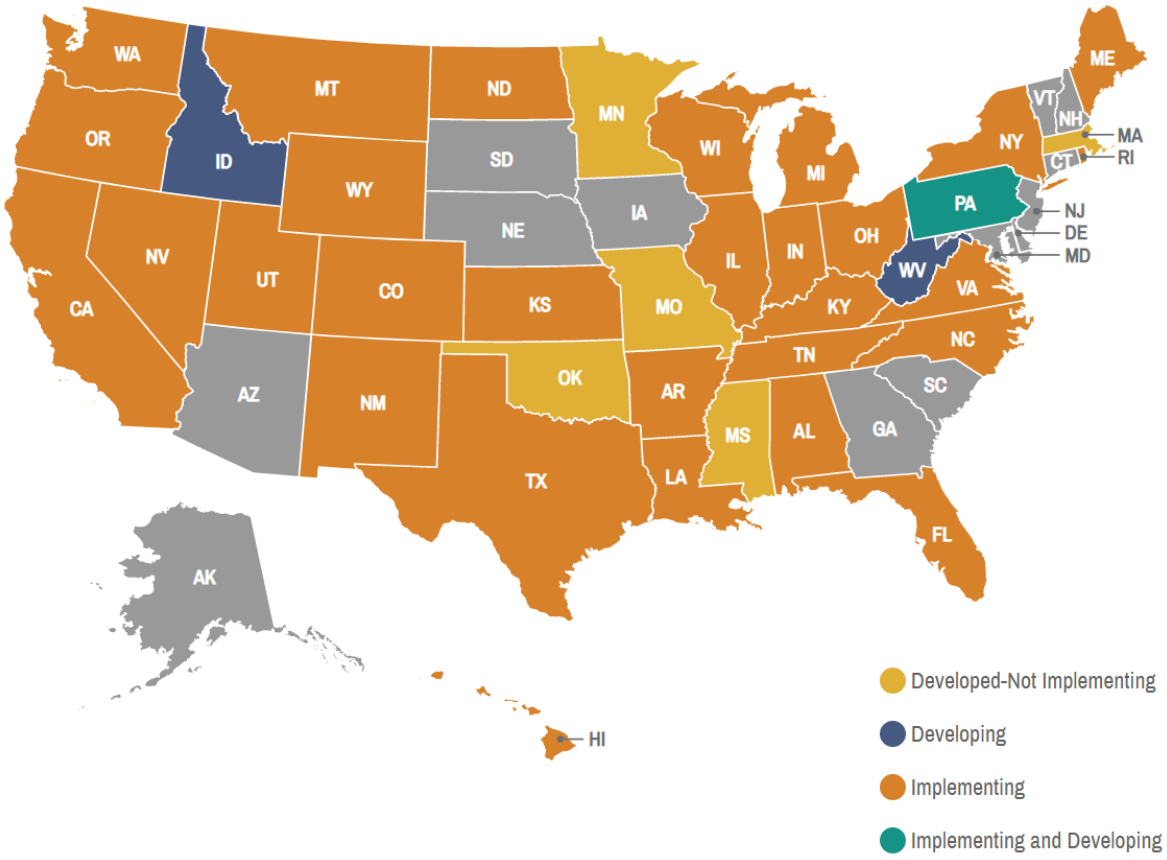

Figure 1 States with Performance Based Funding. Reprinted from Driving Better Outcomes: Fiscal Year 2019 State Status & Typology Update by, Boelscher & Snyder (2019), Retrieved from http://hcmstrategists.com/promising-policy/wp-content/uploads/2019/04/DRIVING-BETTER-Outcomes-Fiscal-Year-2019-State-Status-Typology-Update_Final_Final.pdf.

History of Performance Funding in Florida

Prior to the development and implementation of PBF in Florida three essential environmental factors – the political environment, the economic environment, and the accountability environment – laid the foundation for the impetus of the policy.

Political environment. To understand the history of PBF in Florida it is necessary to understand governance of higher education in Florida and the powers of the Legislature and the governor in making higher education policy. By virtue of a constitutional amendment, approved by voters in 1998, the governance of higher education in Florida moved from the hands of

elected officials and coordinating boards to the Legislature and the governor and his/her appointees.

In 1998, when the amendment was passed, Florida's higher education system was overseen by two boards, the Board of Regents for the State University system and the State Board of Community Colleges. In 2001, the Education Governance Reorganization Implementation Act was passed to fulfill the requirements of the amendment. In accordance, the coordinating boards were abolished and oversight for all levels of education were placed under the Florida Board of Education. The State Board, which was previously staffed by elected officials, would be headed by a governor-appointed commissioner. Additionally, separate boards were established for each university and community colleges retained their already established institutional board structure (Mills, 2007).

The new structure was purported as a result from a dispute between the Board of Regents and then Florida House Speaker John Thrasher. According to Robert Crew's book *Jeb Bush: Aggressive Conservatism in Florida*, the Board of Regents was blocking a plan to create a medical school at the Speaker's alma mater Florida State University. According to Crew (2010) "Thrasher appealed to Bush with a diagram of a new university governance system that would circumscribe the role of the chancellor and the regents and increase that of the state's governor" (p.62). Opposition to the new structure came from U.S. Senator Bob Graham who pushed a separate referendum to create a Board of Governors to oversee the FLSUS thus limiting the oversight of the new Florida Board of Education over the universities (Mills, 2007). Adopted in 2002, the referendum put in place the current governance structure of the FLSUS.

In the end the authority over public education in Florida fell pointedly to the governor. The governor's influence would prove pervasive since the office holds the right to appoint

members to the university boards, the community college boards, the Florida Board of Education, and the FLBOG, as well as veto power over the State Legislature. The new structure created chaos throughout the Jeb Bush years for the FLSUS. The confusion continued past his tenure. The main point of contention flowed from the relationships between the newly formed boards both at the institutional-level and the state-level which were undefined causing confusion in what role each should play in overseeing the FLSUS (Fischer, 2007).

In 2007, the confusion over the FLBOG's authority reached a boiling point. In that year the Legislature passed several statutes that provided for legislative control over the setting of tuition and fees (Graham v Haridopolos, 2013). The FLBOG and several others challenged the constitutionality of the Legislature's authority to do so. In 2010, the FLBOG removed itself from the lawsuit (Florida Board of Governors, 2010). The suit ultimately failed, with the Supreme Court ruling the Legislature has constitutional control over university tuition and fees. According to meeting minutes (Florida Board of Governors, 2010), Board Governor Charlie Edwards outlined the decision as follows:

> It had become clear that the Board had reached an amicable agreement with the House and Senate on the issue of cooperative and collaborative governance of the state universities by the Board of Governors and the Legislature, specifically regarding: the authority of the Board for delegating the powers and duties of the university boards of trustees; the authority of the Board to promulgate regulations through its own processes; the authority of the Board to govern and regulate university information technology; and the authority of the Board to consider and act on a university request for differential tuition and to establish a new fee or, for certain fees, increase an existing fee beyond its current cap, based on criteria developed by the Legislature (Item 2).

This newly established structure is uncommon in higher education. A report by the State Higher Education Executive Officers (SHEEO) (2017), found, using results from a survey of 54 agencies who oversee large populations of public higher education students in 49 states, that very few institutions are under a structure in which the governor or legislature has tuition setting authority. The majority of the agencies responded that tuition and fees were set by governing boards and boards of individual institutions (Armstrong, Carlson, & Laderman, 2017).

Economic environment. In their report on the state of the Florida economy, Dewey and Denslow (2014) describe the impact of the 2008 economic crisis on higher education funding in Florida. According to their reporting, Florida placed last amongst the 50 states in 2012 in combined state appropriation per FTE plus net tuition dollars. According to SHEEO's State Higher Education Finance (2017) website (http://www.sheeo.org/) state appropriations to higher education in Florida fell -23.4% from 2008 to 2017 compared to -11.6% nationally. Over that same period, tuition revenues grew +42.7% compared to +37.4% nationally. This at time when full-time equivalent enrollments (FTE) grew in Florida +10.4% compared to +7.7% nationally. In all, the burden to fund higher education in Florida has shifted from the government and taxpayer to students and families. However, in Florida the tuition revenue, despite large increases in enrollments, has not offset the loss of state appropriations. SHEOO reports total revenue for higher education fell in Florida -5.3% between 2008 and 2017, nationally that rate rose +5.8%. Only Missouri, Louisiana, and Nevada had lower percentage change in revenue during the reporting period.

In 2007, the FLBOG was provided authority to apply a tuition differential fee at campuses that met specific criteria outlined within statute (Florida Statute 1009.24, 2007; Florida Statute 1004.635(3), (2007). Posted to the FLBOG website are the Tuition and Required Fee

reports dated back to the 2000-2001 academic year (FLBOG, 2017b). A review of the documents shows tuition differential first appeared in the 2008-09 Tuition and Required Fees schedule but only for 5 of the 11 universities. The following year the differential was applied to all 11 universities. These fees, as well tuition itself increased each year until 2014-15. Florida Statute 1001.92, State University System Performance-Based Incentive was approved during the 2014-15 legislative year.

Accountability movement. In 2011, Florida Governor Rick Scott, a Republican, distributed a Texas plan for university reform known as the "Seven Breakthrough Solutions." The plan was developed by a Texas think tank, Texas Public Policy Foundation (O'Connor, 2011). The plan was discussed and interpreted during a FLBOG meeting by John Delany, President of the University of North Florida, and written into the minutes in the following language:

> President Delaney said that Governor Scott had begun the conversation with suggestions for higher education that had come from a Texas 'think tank.' He said the Governor wanted to see the universities demonstrate efficiency, productivity, and responsiveness. He said there were a number of perceptions about the universities, issues that the Governor and the legislative leaders focused their interest: that universities were wasteful and not efficient, that they offered obsolete and arcane majors, and classes irrelevant to employment needs; that students were not aware of employment and salary opportunities after graduation; that there were not enough STEM graduates; that graduation rates were not high enough; and concerns about job place placement and salaries post-graduation (Florida Board of Governors, 2011, Item 5).

This discussion highlights Governor Scott's perception of the FLSUS prior to the implementation of Florida's PBF model. Tying his opinion that universities were wasteful and inefficient with his power over the system at a time when funding for the FLSUS was falling dramatically provides the ideal environment for the legislation of PBF. Increasingly dependent on dwindling government appropriations, the FLSUS would have to follow along with this new funding model and the governor had all the power to ensure it happened.

The Florida State University System Performance-Based Funding Model

In 2012, the Florida State Legislature enacted Florida Statute s. 1011.905 Performance Funding for State Universities. The statute outlines a phased-in approach to performance funding and expectations of the universities. Accordingly, during the 2012-13 fiscal year, bonus funding awards of "up to $15 million to the highest-ranked state universities was to be allocated based on the university's ranking in the production of degrees in the following programs 1) computer and information science; 2) computer engineering; 3) information systems technology; 4) information technology; and 5) management information systems. Additionally, the FLBOG, was to select additional factors to rate the university performance in increasing the likelihood that graduates who earn degrees in the above-mentioned programs would "be employed in high-skill, high-wage, and high-demand employment" (Performance Funding for State Universities, 2012, sect. 3c.).

In January of 2014, the FLBOG revised the funding formula because it deemed the universities needed to have more financial incentive to improve their performance on select metrics. The model was based on four guiding principles "1) use metrics that align with SUS Strategic Plan goals, 2) reward Excellence or Improvement, 3) have a few clear, simple metrics, and 4) acknowledge the unique mission of the different institutions" (Florida Board of

Governors, 2014, p.1). Eight of the ten metrics are common across all Florida State Universities, 1 metric was chosen by the FLBOG for each university based on their distinct mission, and one metric was chosen by each university's board of trustees. The metric chosen by the board of trustees must align with the university's work plan (Florida Board of Governors, 2014).

During the 2014-15 legislative process, according to documents retrieved from the FLBOG'S (2018) website, the FLBOG requested $50 million in new funding from the Legislature for fiscal year 2015, which would be matched by $50 million in base funding contributed by the universities. Using the points per metric, universities earned a maximum of 50 points on the performance measures. A university had to earn at least 25 points, and not fall within the bottom three in ranking to earn new funds. A university that earned more than 25 points had their base funding restored and, based on their rank, was eligible for a portion of the new funds. In the first year no university would incur more than a one percent reduction in their overall budget (Florida Board of Governors, 2014).

During the March 2014 meeting of the FLBOG the results of the performance metric scoring were revealed. Based on the formula, three universities failed to meet the threshold of 26 points needed to have their base budgets restored: New College of Florida, Florida Atlantic University, and the University of West Florida (Florida Board of Governors, 2014a). All three universities made satisfactory progress within the fiscal year and eventually had their institutional investments restored. Since then no universities have fallen below the threshold.

The following year, the FLBOG revised the model to a 100-point scale, 10 points per metric and a minimum total benchmark of 51 to be eligible for institutional investment (Florida Board of Governors, 2016). Table 3 shows the points awarded by amount or percentage achieved. Also shown in Table 3 is the number points awarded by percentage improvement.

Table 2

FLBOG PBF Model Metrics (2017-18 Benchmarks)

	Excellence (Achieving System Goals)									
Metrics Common to All Universities	10	9	8	7	6	5	4	3	2	1
Percent of Bachelor's Graduates Employed ($25,000+) or Continuing their Education Further. One Year After Graduation	72.8%	70.5%	68.3%	66.0%	63.7%	61.4%	59.2%	56.9%	54.6%	52.3%
Median Wages of Bachelor's Graduates Employed Full-time in Florida One-Year After Graduation	$40,700	$38,200	$35,700	$33,200	$30,700	$28,200	$25,700	$23,200	$20,700	$18,200
Net Tuition & Fees per 120 Credit Hours	$9,000	$10,000	$11,000	$12,000	$13,000	$14,000	$15,000	$16,000	$17,000	$18,000
6-year Graduation Rate [Includes full- and part-time FTIC]	70%	68.8%	67.5%	66.3%	65%	63.8%	62.5%	61.3%	60%	58.8%
Academic Progress Rate [FTIC 2-year Retention Rate with GPA Above 2.0]	90%	88.8%	87.5%	86.3%	85%	83.8%	82.5%	81.3%	80%	78.8%
Bachelor's Degrees Awarded Within Programs of Strategic Emphasis [includes STEM]	50%	47.5%	45%	42.5%	40%	37.5%	35%	32.5%	30%	27.5%
University Access Rate [% of Fall Undergraduates with a Pell grant]	30%	28.8%	27.5%	26.3%	25%	23.8%	22.5%	21.3%	20%	18.8%
Graduate Degrees Awarded Within Programs of Strategic Emphasis [Includes STEM]	60%	57.5%	55%	52.5%	50%	47.5%	45%	42.5%	40%	37.5%
Freshmen in Top 10% of High School Graduating Class [for NCF only]	50%	47.5%	45%	42.5%	40%	37.5%	35%	32.5%	30%	27.5%
Board of Governors Choice Metric										
Percent of Bachelor's Degrees Without Excess Hours	80%	77.5%	75%	72.5%	70%	67.5%	65%	62.5%	60%	57.5%
Number of Faculty Awards [for FSU and UF only]	Varies by institution									
Number of Top 50 Rankings in Select National Publications [for NCF only]	5		4		3		2		1	
Board of Trustees Choice Metric [University specific]	Varies by institution									
% Improvement	5%	4.5%	4.0%	3.5%	3.0%	2.5%	2.0%	1.5%	1.0%	0.5%
Points	10	9	8	7	6	5	4	3	2	1

Note. Adapted from Florida Board of Governors. (2017a). Performance Based Funding Model 2017-18 Benchmarks [Table]. Retrieved from https://www.flbog.edu/wp-content/uploads/PBF-Model-Benchmarks-2017-18.pdf

Impacts of Performance Based Funding

The Federal Student Right-to-Know and Campus Security Act of 1991 requires institutions of higher education who participate in federal student assistance programs to report their completion or graduation rates. The law is intended to provide students with the information to compare the "quality" of higher education institutions. According to Astin (2005), students are to infer from the Act that they are much more likely to graduate if they attend an institution with a higher graduation rate than a lower rate. However, he argues, the mere measure of the rate may not tell the full story unless we examine both the inputs and outputs of institutions.

PBF models are formulated to increase university output metrics, such as graduation and retention rates, as well as the number of degrees awarded. However, studies from the PBF literature that examined the expressed intended impact of these policies, in all, mostly found weak to no improvements in graduation and retention rates or the production of degrees (Hillman et al, 2015; Shin, 2010; Tandberg & Hillman, 2014).

At the same time, the literature does show evidence of negative impacts on the access to higher education of students from lower-socioeconomic backgrounds and those from underserved races because of increased selectivity (Gandara & Rutherford, 2017; Umbricht et al, 2015; Walker, 2016). Additionally, PBF impacts different types of institutions differently. The literature has found that the institutions that serve mainly affluent students from majority-served races are advantaged under PBF policies; thus, PBF creates an incentive for institutions that serve lower-income and minority students to move away from enrolling these disadvantaged groups (Hillman & Corral, 2018; McKinney & Hagedorn, 2017).

Outcome metrics. A review of the literature on the impact of PBF on the outcome metrics, graduation and retention rates, resulted in little evidence that PBF has had a significantly positive impact on the rates, or on degree production as well. For instance, Hillman et al (2015) found no evidence that distinguished the rates of retention of students in Washington community and technical colleges, nor did their degree production improve more than schools in states without a PBF policy. Hillman et al (2018) found similar degree production results in Ohio and Tennessee when compared to all states without a PBF policy in place.

Tandberg and Hillman (2014) did find some evidence that baccalaureate degree completions began to positively correlate with PBF after seven years; however, Shin (2010) found no improvement in the graduation rates of public universities regardless of the length of time the policy was in effect or the type of policy. Interestingly, he did find that most of the variation in these rates was related to institutional characteristics, not PBF. Rutherford and Rabovsky (2014) also concluded that outcomes such as retention "are related to student profiles, institutional characteristics and state environments but are not enhanced by performance funding policies" (p.203).

Access metrics. According to Dougherty et al (2016) one of the most reported effects of PBF is increased selectivity in admissions. Colleges and universities understand that to increase the odds of being successful, college admission offices can raise the standards for grade point averages (GPA) and standardized test scores because selectivity in admissions is positively correlated with graduation and retention rates (Carnevale & Rose, 2003; Gansemer-Topf, Downey, Thompson, & Genschel, 2018; Gansemer-Topf & Schuh, 2006). Astin and Oseguear (2012) found that high school GPA had a "unique predictive power" of degree completion rates, after controlling for other pre-college student characteristics. They found the same strength in

test scores but discovered that test scores did not have a unique effect when other variables such as father's education were entered into the regression. Favero and Rutherford (2019) explain that institutions are aware of the relationship between student success and student pre-college academic qualifications and that many are enticed to engage it was is known as "creaming" or selecting for admission only the students most likely to succeed.

Umbricht et al. (2015) provide an example of the impact of PBF policy on "creaming" in the student admissions to Indiana higher education institutions over a 10-year period. They concluded admissions rates to Indiana's public colleges and universities declined when compared to private institutions. At the same time admissions declined, standardized test scores of admitted students increased. This overall decrease in admissions also resulted in a decrease in degree production.

Student demographic characteristics. When institutions become more selective in their admissions, evidence shows minority and lower-income student admission rates drop (Dougherty et al, 2016; Umbricht et al, 2015). The move toward higher selectivity and less diversity is likely attributed to findings that variation in degree completion rates can be attributed to the characteristics of the student body (Astin, 2005; Pike & Graunke, 2015; Reason, 2003).

A recent study by Crisp, Doran, and Salis Reyes (2018) concluded that broad access institutions who enroll a high percentage of students from lower-socioeconomic classes and are African American or Hispanic increase the likelihood of decreased overall graduation rates, especially for African Americans and Hispanics. According to Rhoades (2012), PBF policies are increasing the college achievement gap for both underrepresented minorities and students from lower-socioeconomic backgrounds. The author points to relationship with PBF policies and the cutting of public higher education budgets which lead to the increase in costs for students and

families. He also finds that institutions are discouraged from enrolling low-income, in-state students who pay less tuition and who require more financial aid. Umbrict et al (2015) found similar results in Indiana where access to institutions without open access admissions decreased and students from minority backgrounds or from lower-socioeconomic statuses were less likely to receive the benefits of higher education when compared to neighboring states.

Race-related characteristics. Although access and success in higher education is dependent on numerous dynamic issues and considerations, race is one of the most salient of factors (Espinosa, Turk, Taylor, & Chessman, 2019). Barriers to higher education are significant for those who have been traditionally underrepresented in higher education, including African Americans, Hispanics, and Native Americans. Barriers to increasing the access and success of these groups in higher education include a lack of access to college-preparatory high school classes, standardized testing, and bias in college admissions (Cokley, Obaseki, Moran-Jackson, Jones, & Vohra-Gupta, 2016; Thornhill, 2019).

According to Espinosa et al (2019), students of color have seen recent gains in postsecondary enrollment but the data reflects still low levels of access and success for certain groups. For instance, the authors state that among college-age students Black and American Indian students have amongst the lowest levels of representation in secondary school completers and are less likely than any other racial/ethnic groups to attend a 4-year college or university or to pursue a bachelor's degree. They also found that Black students are the least likely of any group to attend a highly selective institution. They also found that Hispanics are gaining traction in higher education with every new generation but that they currently have the lowest levels of secondary educational attainment. The group found, in 2017, the majority of Hispanic adults had earned a high school credential or less.

Under PBF policies the rates of access and success in higher education have been mixed. For instance, Umbricht et al (2015) found access of racial and ethnic minorities to Indiana's public colleges and universities declined under PBF. Gandara and Rutherford (2017) found negative effects of PBF for Hispanic and Black enrollment even when specific metrics aimed at increasing minority enrollment were included in the PBF policy. Kelchen (2018) on the other hand found large increases in Black student enrollment in states with PBF policies that included equity metrics when compared to states without a PBF policy but he also concluded that most of the enrollment increases where attributable to less selective institutions.

Income-related characteristics. Dougherty et al (2016) inform that institutions perceive lower-income students as a drag on institutional resources. Institutions reported to the researchers that many lower-income students were first generation students who were less prepared for college both academically and socially. Additional monetary burdens require many to work in addition to school putting a strain on their ability to complete on-time or at all. The authors concluded that to meet the demands of PBF policies it's in the institution's best interest to avoid enrolling students from lower-socioeconomic backgrounds.

Supporting these institutionalized perceptions, Astin and Osegura (2012) determined that students who come from higher socioeconomic classes have an increased likelihood of degree completion, even when controlled for by standardized tests scores and motivational factors. Marsh (2014) found an inverse relationship between the number of students receiving financial aid and retention rates. Olbrecht, Romano and Teigen (2016) also found a family's capacity to contribute to a student's education, as estimated by the federal financial aid calculation for the "Estimated Family Contribution (EFC)", had a linear relationship with retention rates.

These patterns in research and perceptions are tested further when PBF policies are included in the studies. The research literature includes studies that question if PBF incentivizes limiting the access of students from lower-income classes to improve graduation and retention rates. For example, Kelchen and Stedrak (2016) found that both 2-year and 4-year institutions subject to PBF policies had received less funds from Pell Grants and an increase in unfunded grant aid than their non-PBF counterparts, to which they concluded institutions under PBF policies were using non-need based financial aid to recruit students from higher income brackets.

Institutional type. The ability to be selective in admissions and how well-resourced an institution is are often cited as the mediating factors of institutional performance under PBF policies (Favero & Rutherford, 2019; Jones et al, 2017; Kelchen, 2018). Two categories of postsecondary institutions that highlight these factors are Minority Serving Institutions (MSIs) and the Carnegie Classification for Highest Research institutions.

Carnegie Classification. According to the Carnegie Classification website (The Carnegie Classification of Institutions of Higher Education, n.d.), the Carnegie Foundation began classifying institutions of higher education in 1970. They created the classification system to assist researchers in standardizing the differences between institutions when a need for specific institutional characteristic representations or differences were needed. Institutions are classified by their research level and the highest degree-level awarded, for instance the "R1" classification represents institutions with the very high research activity who award at least 20 research/scholarship doctoral degrees each year.

Marsh (2014) found thorough a hierarchical regression model with controls for student characteristics that institutions classified under the Carnegie Classification as Research/Doctoral institutions had higher retention rates than institutions in lower classifications. Hamrick, Schuh,

and Shelley (2004) found a similar relationship between Carnegie Classification and graduations rates and hypothesized the results were because these institutions were more likely to be well financed and better resourced.

Sandford and Hunter (2011) included Carnegie Classification in their study of PBF impacts on retention and graduation rates as a proxy for "mission differentiation." Their study results in models that showed no effect for PBF on retention rates but did find lower Carnegie classifications as a covariate in the model showed a negative association to retention rates over time. Tennessee acknowledged the differentiation between institutions with different Carnegie classifications in their PBF model, Complete College Tennessee Act of 2010. Each metric is weighted by an institution's particular mission and priorities which are often based on their Carnegie Classification (Tennessee Higher Education Commissions, n.d.).

Minority Serving Institutions. According to Hillman and Corral (2018), institutions whose mission is to serve minority racial and ethnic groups have historically been underfunded by their states. To counter the disparity, they point to the federal designation of MSIs such as Historically Black Colleges and Universities (HBCUs) and Hispanic-Serving Institutions. With this federal designation additional federal monies are available to these institutions. Despite this additional assistance these institutions are often less-well-resourced than their predominately white counterparts (Jones et al, 2017)

Jones et al (2017) explored the impact of PBF on MSI. According to the authors, typical strategies of increasing selectivity and decreasing the enrollment of certain groups to improve performance on PBF metrics are problematic for these types of institutions because their missions are specifically targeted to provide access to underrepresented minorities. Hillman and Corral (2018) studied the effects of PBF on minority serving institutions and found PBF models

incentivize these universities to step away from their missions of serving students from underrepresented minority groups. Favero and Ruthrford (2019) furthered this research by studying PBF as it affects equity across institutions. They found through Monte Carlo Simulations that PBF funding models benefit selective schools and adversely affect HBCU institution graduation rates. They theorized that the differing effects are because institutions that are highly resourced and better able to attract applicants are better positioned to be highly selective.

Given the literature on the relationship between institutional type and selectivity and funding, PBF policies should be targeted toward institutions that are under-resourced and who serve the neediest students, such as MSIs. Well-resourced, elite schools are already sufficiently producing graduates and meeting metrics. By shifting resources toward colleges with a lowered capacity to improve students' outcomes, PBF policies could close inequities across the different types of higher education institutions (Hillman, 2016; Hillman & Corral, 2018).

Services to improve graduation and retention rates. According to a recent article in Florida Trend (Dahlberg, 2019), FLSUS Chancellor Marshall Criser III, describes PBF as an incentive to the universities to turn away from enrolling high numbers of students and to move their focus to graduating students within 4 years. The article points to numerous programs the FLSUS institutions have initiated to improve retention and graduation rates including the creation of "success teams" or persistence committees that provide individualized counseling in all student services and academic advising areas. Universities are also using predictive analytics to identify students most at risk of failing or dropping out and those that are not on track to complete within four years. Specialized services are then offered to these students, including

mini grants for those with financial need or more intrusive advising to keep students on track academically.

To add to the understanding if adding services, such as those implemented in Florida, leads in to improved results, Gansemer-Topf and Schuh (2006) studied the relationship of institutional selectivity and institutional expenditures on retention and graduation rates. They found that an increase in expenditures on instruction significantly contributed to increased graduation and retention rates regardless of selectivity. However, they also found that increased expenditures on academic support expenditures at low selectivity institutions did not improve retention rates. They hypothesized that lower selectivity institutions have fewer resources to devote to these types of activities and there for my not be able to adequately fund these ventures. Marsh (2014) also found increased expenditures on student services, after controlling for student characteristics, had no statistically significant effect on retention rates.

Theoretical Framework

The theoretical framework of resource dependence theory provides the lens through which PBF was examined in this study. According to Malatesta and Smith (2014), the main objectives of the theory are to describe the environment an organization operates in through the dispersion of power and authority, the availability of critical resources, and interdependence of organizations within the environment. This study adopted the theory's objectives by examining PBF as a proxy for the power of the governor and the Legislature over the FLSUS, and how their control of critical resources of tuition-setting and state appropriations leaves the FLSUS dependent on government and therefore willing to meet its demands.

Resource dependence theory also provides that "because an organization survives only to the extent it creates and maintains the coalition of support necessary for operation, the existence

of competing demands can be a problem. Each time the organization satisfies the demands of one participant or interest group it simultaneously constrains its own behavior in meeting other or subsequent demands" (Pfeffer & Salanick, 2003, p.29). Using this statement as a guide, the study also explored levels of access to FLSUS institutions since, given the theory, it can be hypothesized that while universities are attending to the demands of the governor and the Legislature, universities may be forced to decrease access and to direct resources towards students that ensure success in meeting the PBF metrics.

Chapter Summary

Chapter II was a review of the literature related to PBF. The literature was discussed from the point of the drivers of the creation of the PBF policies, as well as the impacts of the policy. The review of the history of PBF policy in Florida mirrors closely the nation-wide stimulus for enacting these types of funding protocols. Finally, findings from the research show unintended outcomes have been generated from PBF policies while little evidence has been found to support the intended outcomes.

Based on the review of the literature it is expected that this study will find that to meet the demands of PBF FLSUS institutions will increase their admissions criteria, fewer students from minority backgrounds and lower-socioeconomic statuses will be enrolled, and that the different institutions will be varied in their ability to improve retention and graduation rates.

The next chapter, Chapter III, outlines the research methods of this study.

CHAPTER III:

METHODS

The following chapter provides a description of the research design for this study. Included in the discussion is an overview of the population, the data sources, and the selection of the variables. The following research questions were formulated to explore the trends in the data at both the individual FLSUS institution and at the aggregate FLSUS level.

I. Coincident with the years before and after the implementation of PBF, what are the trends in the outcome metrics, access metrics, and student demographic characteristics
    a. at the FLSUS-level and
    b. at the FLSUS institution-level?

II. Coincident with the years before and after the implementation of PBF, what is the relationship between 1st-year retention rate and the access metrics and student demographic characteristics?

III. If the FLSUS institutions are divided into groups based on their institutional characteristics, is there a difference between the relationships of 1st-year retention rate and the access metrics and student demographic characteristics for each group?

IV. What is the average growth in 1st-year retention rates and 6-year graduation rates coincident to the years before and after implementation of PBF?

Research Design

The purpose of the study is to explore and describe changes in student access to or success within the FLSUS coincident to the implementation of PBF. The purpose of this study is not to infer causation but rather to explore the nature of the data. The study utilized longitudinal, quantitative data to identify trends in the data before and after the implementation of the PBF policy. This non-experimental, exploratory study focuses both on changes at the FLSUS-level and within the individual FLSUS institutions.

Population. The population understudy is 10 (N=10) of the 12 FLSUS institutions. Florida Polytechnic University (FPU) was not included because it is the newest of the FLSUS institutions and has not yet participated in PBF. New College of Florida (NCF) was also excluded because of their unique honor's college mission, their limitation to undergraduate degrees, and their enrollment size (less than 900 students). The regional campuses of the University of South Florida (USF), USF St. Petersburg and USF Sarasota-Manatee, are also excluded from the study. It should be noted, however, that USF IPEDS data reported prior to 2009 does include data from those campuses. The included 10 universities are public institutions who offer a bachelor-level degree and higher. Since the study includes only FLSUS institutions it is not intended to generalize to universities in other states. Table 3 provides further detail about each of the FLSUS institutions, including FPU and NCF.

Table 3

FLSUS Institution Descriptions

University	Mission	Fall 2017 Headcount	Institution Classifications
Florida Agriculture & Mechanical University (FAMU)	Florida Agricultural and Mechanical University (FAMU) is an 1890 land-grant institution dedicated to the advancement of knowledge, resolution of complex issues and the empowerment of citizens and communities. The University provides a student-centered environment consistent with its core values. The faculty is committed to educating students at the undergraduate, graduate, doctoral and professional levels, preparing graduates to apply their knowledge, critical thinking skills and creativity in their service to society. FAMU's distinction as a doctoral/research institution will continue to provide mechanisms to address emerging issues through local and global partnerships. Expanding upon the University's land-grant status, it will enhance the lives of constituents through innovative research, engaging cooperative extension, and public service. While the University continues its historic mission of educating African Americans, FAMU embraces persons of all races, ethnic origins and nationalities as life-long members of the university community.	Undergraduate – 7,550 Graduate – 1,864	Historically Black Institution Carnegie Classification: Doctoral Universities: Higher Research Activity
Florida Atlantic University (FAU)	Florida Atlantic University is a multi-campus public research university that pursues excellence in its missions of research, scholarship, creative activity, teaching, and active engagement with its communities.	Undergraduate – 23,766 Graduate – 4,901	Hispanic Serving Institution Carnegie Classification: Doctoral Universities: Higher Research Activity

Table 3 (Continued)

FLSUS Institution Descriptions

University	Mission	Fall 2017 Headcount	Institution Classifications
Florida Gulf Coast University (FGCU)	Florida Gulf Coast University, a comprehensive institution of higher education, offers undergraduate and graduate degree programs of strategic importance to Southwest Florida and beyond. FGCU seeks academic excellence in the development of selected programs and centers of distinction in science, technology, engineering and mathematics (STEM) disciplines, health professions, business, and marine and environmental sciences. Outstanding faculty and staff supported by a strong community of advisors prepare students for gainful employment and successful lives as responsible, productive and engaged citizens. FGCU emphasizes innovative, student-centered teaching and learning, promotes and practices environmental sustainability, embraces diversity, nurtures community partnerships, values public service, encourages civic responsibility, and cultivates habits of lifelong learning and the discovery of new knowledge.	Undergraduate – 13,582 Graduate – 1,014	Carnegie Classification: Master's Colleges & Universities: Larger Programs
Florida International University (FIU)	Florida International University is an urban, multi-campus, public research university serving its students and the diverse population of South Florida. We are committed to high-quality teaching, state-of-the-art research and creative activity, and collaborative engagement with our local and global communities.	Undergraduate – 41,852 Graduate – 8,700	Hispanic Serving Institution Carnegie Classification: Doctoral Universities: Highest Research Activity

Table 3 (Continued)

FLSUS Institution Descriptions

University	Mission	Fall 2017 Headcount	Institution Classifications
Florida State University (FSU)	Florida State University preserves, expands, and disseminates knowledge in the sciences, technology, arts, humanities, and professions, while embracing a philosophy of learning strongly rooted in the traditions of the liberal arts. The university is dedicated to excellence in teaching, research, creative endeavors, and service. The university strives to instill the strength, skill, and character essential for lifelong learning, personal responsibility, and sustained achievement within a community that fosters free inquiry and embraces diversity.	Undergraduate – 32,718 Graduate – 7,849	Carnegie Classification: Doctoral Universities: Highest Research Activity
New College of Florida (NCF)	New College offers a liberal arts education of the highest quality in the context of a small, residential public honors college with a distinctive academic program which develops the student's intellectual and personal potential as fully as possible; encourages the discovery of new knowledge and values while providing opportunities to acquire established knowledge and values; and fosters the individual's effective relationship with society.	Undergraduate – 834 Graduate - 22	Honors College of Florida Carnegie Classification: Baccalaureate Colleges: Arts & Sciences Focus

Table 3 (Continued)

FLSUS Institution Descriptions

University	Mission	Fall 2017 Headcount	Institution Classifications
University of Central Florida (UCF)	The University of Central Florida is a public multi-campus, metropolitan research university that stands for opportunity. The university anchors the Central Florida city-state in meeting its economic, cultural, intellectual, environmental, and societal needs by providing high-quality, broad-based education and experience-based learning; pioneering scholarship and impactful research; enriched student development and leadership growth; and highly relevant continuing education and public service initiatives that address pressing local, state, national, and international issues in support of the global community.	Undergraduate – 56,408 Graduate – 8,840	Carnegie Classification: Doctoral Universities: Highest Research Activity
University of Florida (UF)	The University of Florida is a comprehensive learning institution built on a land-grant foundation. We are The Gator Nation, a diverse community dedicated to excellence in education and research and shaping a better future for Florida, the nation and the world. Our mission is to enable our students to lead and influence the next generation and beyond for economic, cultural and societal benefit.	Undergraduate – 36,436 Graduate – 8,840	Carnegie Classification: Doctoral Universities: Highest Research Activity

Table 3 (Continued)

FLSUS Institution Descriptions

University	Mission	Fall 2017 Headcount	Institution Classifications
University of North Florida (UNF)	The University of North Florida's academically talented students receive individualized attention and opportunities to engage in transformational learning: e.g., community engagement, internships, international study, and research. Dedicated faculty and staff create a rich learning environment on a beautiful campus that provides an inspiring setting for our diverse community. Together, we enhance the economic and cultural development of our growing metropolitan region.	Undergraduate – 13,987 Graduate – 1,967	Carnegie Classification: Master's Colleges & Universities: Larger Programs
University of South Florida System (USF)	The University of South Florida System, which includes USF Tampa, USF St. Petersburg, and USF Sarasota-Manatee, catalyzes and coordinates initiatives at and among its interdependent institutions to prepare students for successful 21st century careers; advances research, scholarship, and creative endeavors to improve the quality of life; and engages its communities for mutual benefit.	Undergraduate – 36,955 Graduate – 11,569	Carnegie Classification: Doctoral Universities: Highest Research Activity

Table 3 (Continued)

FLSUS Institution Descriptions

University	Mission	Fall 2017 Headcount	Institution Classifications
University of West Florida (UWF)	Our Mission at UWF is to provide high-quality undergraduate and graduate education, conduct teaching and research that services the body of knowledge, and contribute to the needs of professions and society.	Undergraduate – 9,547 Graduate – 2,781	Carnegie Classification: Doctoral Universities: Moderate Research Activity
Florida Polytechnic University (FPU)	The mission of Florida Polytechnic University is to prepare 21st century learners in advanced fields of science, technology, engineering, and mathematics (STEM) to become innovative problem-solvers and high-tech professionals through interdisciplinary teaching, leading-edge research, and collaborative local, regional and global partnerships.	Undergraduate – 1,439 Graduate - 17	Carnegie Classification: Baccalaureate Colleges: Diverse Fields

(Florida Board of Governors, 2018; Carnegie Classification of Institutions of Higher Education 2017)

Data source. The main data source for the study is The National Center for Education Statistics (NCES) Integrated Postsecondary Education Data System (IPEDS). NCES is "the primary federal entity for collecting, analyzing, and reporting data related to education in the United States and other nations (Ginder, Kelly-Reid, & Mann, 2018, p.ii). IPEDS is the online system by which NCES collects data from post-secondary institutions. Submissions to IPEDS are mandated by the Higher Education Amendments of 1992 and are required for participation in federal financial aid programs. Respondent institutions submit data to IPEDS via a web-based collection system. Before submissions are electronically accepted, reported data must pass automated edit checks to ensure for consistency of the reported values. Additionally, the data is extensively reviewed by IPEDS staff prior to public posting.

Weighted high school GPA data was collected from the FLBOG website. The FLBOG staff within the Office of Data & Analytics (ODA) collects and analyzes data collected from the FLSUS institutions via the State University Database System (SUDS). Data posted to the FLBOG website are intended for public use and are vetted by FLBOG ODA staff prior to public posting.

Selection of the variables. Selection of the outcome metric variables was based on the FLSUS PBF metrics and the availability of the data within the IPEDS. Based on this review, the 6-year graduation rate and the 1st-year retention rate were selected. It should be noted, the PBF model measures institutions based on the percentage of FTIC students retained in their 1st-year who have a GPA above 2.0. This measure was not available in the IPEDS, however, 1st-year retention of FTIC student at any GPA is a close surrogate.

Selection of the student characteristic variables was based on the review of the literature. According to Astin (2005), graduation and retention rates are heavily dependent on the

characteristics of entering students. Additionally, graduation and retention rate measures are typically reserved for FTIC students, as in the case in the Florida PBF. Therefore, as shown in Table 4, variables related to characteristics of FTIC students were chosen.

The selection of the years to include in the study was based on the year in which PBF was implemented. According to the FLBOG website (2018), 2014-15 was the first year of funding in which the university base funding was held back if the PBF metric thresholds were not met. This funding was based on the performance of universities on the PBF metrics during the 2013-14 reporting year. Therefore, IPEDS reporting for the 2013 cohort was established for this study as the year of PBF implementation in Florida.

To provide a longitudinal trend review of the university performance, student characteristics were collected for students beginning with the 2007 admitted IPEDS cohort of full-time, first-time students and continuing to the most recent final and full reporting of IPEDS data, 2017. 2007 is the first cohort for which IPEDS collected data on the percentage of Pell Grant recipients.

Graduation rates could only be reported for cohorts through 2012 since there is a 6-year lag in reporting. Although this study was designed to understand the relationship between PBF and the outcome metrics and student and institutional characteristics it is not possible to consider how PBF may have impacted the selection of the graduation rate cohorts since, again, all occurred prior to the implementation of PBF. It is, however, possible to study the trends in the data coincident to PBF implementation since it has been reported the FLSUS institutions have put in place numerous support services to ensure students graduate in a timely manner in response to the implementation of PBF (Dahlberg, 2019). Therefore, FLSUS institution graduation rates were collected for the 2001 cohort to the 2012 cohort. The researcher considered

the PBF implementation year as the graduation rate year of 2013-14, which measured the rate of graduation within 6 years for the 2008 cohort. Separate databases for both retention rates and graduation rates were generated because of the difference in reporting periods.

All outcome metric and student characteristic data was collected from IPEDS except high school weighted GPAs because IPEDS does not collect this data. This data was downloaded from the FLBOG website. The FLBOG only posted data through 2016.

Table 4

Outcomes, Access, and Student Demographic Characteristic Variables

Variable	Admission Cohort Years	Research Question
Outcome Metrics		
6-year graduation rate	2001-2012	I and IV
1st-year retention rate	2007-2017	I, II, III, and IV
Access Metrics		
Admission acceptance rate (Conversion rate)	2007-2017	I, II, III
25th and 75th SAT math test scores of FTIC admits	2007-2017	I, II, III
25th and 75th SAT critical reading test scores of FTIC admits	2007-2017	I, II, III
Average Entering High School Weighted GPA of FTIC admits	2007-2016	I, II, III
Student Demographic Characteristics		
Percentage of FTIC admits who were Hispanic who enrolled	2007-2017	I, II, III
Percentage of FTIC admits who were African American who enrolled	2007-2017	I, II, III
Percentage of FTIC admits who were underrepresented minorities (Hispanic, African American, or Native American combined) who enrolled	2007-2017	I, II, III
Percentage of FTIC admits who received a Pell Grant	2007-2017	I, II, III

Listed in Table 5 are the organizing variables including codes for Minority Serving Institutions and Carnegie Classification. According to Hamrick, Schuh, and Shelly (2004) institutions with higher Carnegie classification levels are more likely to be highly selective institutions; therefore, the classification is used as a proxy for selectivity.

Table 5

Grouping Variables

Variable	Measure
PBF Years Time Points	Dummy Coded 0, 1 Pre-PBF = 0, Post-PBF= 1
University	Categorical, Coded 1-10
University Grouping – Minority Serving Institution (MSI)*	Dummy Coded, Not MSI = 0, HBCU or HSPI = 1
University Grouping – Carnegie Classifications (proxy for selectivity)	Dummy Coded, High Research Activity and Below = 0, Highest Research Activity = 1
IPEDS Reporting Year	Categorical
Admission Cohort Year	Categorical

**UCF received its Hispanic Serving designation in 2019. It was not coded as a minority serving for the purposes of this study because the designation was not in place for the years included in the study.*

Methods. To ensure a thorough investigation of the changes that occurred within and across FLSUS institutions an Exploratory Data Analysis (EDA) was conducted. EDA grew from the work of John Tukey who developed the approach to supplement confirmatory analysis with a goal of generating a deeper understanding of the data and to inform ideas for further investigation (Pertl & Hevey, 2012). According to Heckert and Filliben (2003), the goals of EDA

are the identification of important factors, relationships, and outliers and to suggest models that best fit the data. To this end, EDA is often described as "detective work" characterized by wide-ranging techniques, flexibility in the selection of methods, and adherence to data-driven hypothesis generation (Pertl & Hevey, 2012). The researcher used Microsoft Excel 2016 and SPSS Statistics v.25 for building the databases, generating graphs, and conducting analyses.

Research Question I. To answer Research Question I, the researcher built a database to house data pulled from the IPEDS and from the FLBOG website. Using SPSS v.25, the researcher generated descriptive statistics, mean, standard deviation, and the minimum and maximum values. The descriptive statistics describe the behavior of the variables at the individual institutional level before and after the implementation of the PBF.

To better understand the trends in the variables of study over time, line graphs of the variables at the FLSUS-level and institution-level were generated using Excel. A vertical line in the line graph marks the implementation of PBF. The line is provided for clarification and should not be view as inferring causation.

Research Question II. To answer Research Question II, the researcher ran pairwise correlations to provide a description of the relationship between 1st-year retention rates and the access metrics and student demographic characteristics. The assumptions of normality, linearity, and homoscedasticity were reviewed to ensure proper interpretation of the results.

According to Gall, Gall and Borg (2007), through correlations we understand the strength and direction of the relationships between variables. Pearson product-moment correlation coefficients were generated for each pairwise correlation. According to Urdan (2010), "a correlation coefficient tells us whether we can know anything about the scores on one variable if we already know the scores on a second variable" (p.87). The information in the correlation

coefficients identify if variance in the 1st-year retention rates are associated with any of the 10 access and student demographic characteristic variables.

Interpretation of the coefficients followed Cohen's (1988, as cited in Pallant, 2007) guidelines

Small r =.10 to .29
Medium r = .30 to .49
Large r = .50 to 1.0

The researcher then compared the strength of the correlation coefficients prior to and after PBF implementation and to test for statistically significant difference between the coefficients. The researcher followed instructions of Pallant (2007) to convert each of the r-values to z-values using the r to z transformation table (Edwards, 1967 as cited in Pallant 2007). These values were inserted into the following equation

$$\frac{Z_{OBS} = Z_1 - Z_2}{\sqrt{\frac{1}{N1-3} + \frac{1}{N2-3}}}$$

The difference was found to be statistically significant if the Z_{obs} value was less than -1.96 or greater than +1.96.

Research Question III. To answer Research Question III, the researcher produced correlation coefficients for 1st-year retention and the access metrics and student demographic characteristics separately for minority serving and non-minority serving institutions and for institutions with the Highest Research Carnegie Classification and those with High Research and lower classifications. The correlations were compared between the groups and the following equation was again applied to values

$$\frac{Z_{OBS} = Z_1 - Z_2}{\sqrt{\frac{1}{N1-3} + \frac{1}{N2-3}}}$$

The same level of statistical significance applied. The difference was found to be statistically significant if the Z_{obs} value was less than -1.96 or greater than +1.96.

Research Question IV. To answer Research Question IV, piecewise growth models were generated, using SPSS v. 25, to examine separate growth slopes for both 6-year graduation rates and 1st-year retention rates for the time prior to the implementation of PBF and the years after the implementation. These models were fitted to both the aggregated FLSUS level and to the individual institution level. The data in the datasets were recoded into new variables to accommodate testing procedures. Table 6 and 7 outline the recoding of the year variables for both the 1st-year retention rate and the 6th year graduation rate following instructions laid out by Heck, Thomas and Tabata (2014).

Table 6

6-year Graduation Rates Recoded Time Variables for Piecewise Growth Model

Variable	Description	Values
Index (Time)	Recoded cohort years to index the repeated measure of retention rate from 2001 to 2012.	1-12
Implement0 (Pre-Implementation Slope)	Recoded Index to a time-related variable representing pre-PBF's yearly growth of retention rates	0,1,2,3,4,5,6,6,6,6,6,6
Implement1 (Post-Implementation Slope)	Recoded Index to a time-related variable representing post-PBF yearly growth of retention rates	0,0,0,0,0,0,0,1,2,3,4,5

Table 7

1st-year Retention Rate Recoded Time Variables for Piecewise Growth Model

Variable	Description	Values
Index (Time)	Recoded cohort years to index the repeated measure of retention rate from 2007 to 2017.	1-11
Implement0 (Pre-Implementation Slope)	Recoded Index to a time-related variable representing pre-PBF's yearly growth of retention rates	0,1,2,3,4,5,5,5,5,5
Implement1 (Post-Implementation Slope)	Recoded Index to a time-related variable representing post-PBF yearly growth of retention rates	0,0,0,0,0,0,1,2,3,4,5

Prior to formulating the piecewise growth model for the aggregated FLSUS level, an unconditional mean model was fitted to examine the institution-level variation in the retention and graduation rates without regard for time. According to Shek and Ma (2011), the unconditional mean model is an assessment of the amount of outcome variation that exists in intra- and inter-individual levels" (p.50). Results from the unconditional model were used to calculate the intraclass correlation coefficient or ICC. The ICC provides the amount of variance in the outcome variable that is attributed to differences between the institutions.

Following the review of the results from the unconditional mean model, the researcher ran the unconditional linear growth curve model. Shek and Ma (2011) explain this model as a method to produce the baseline rate of the individual variation of the growth rates or each institution's rate of change over time. By examining the results for the "time" fixed effect the researcher has the information needed to decide if further model testing is warranted.

Significant results from the unconditional growth model prompt a testing of the growth trajectory of retention and graduation rates prior to and after PBF implementation using the piecewise growth model. The researcher used Heck et al (2014) as a reference for setting up the

growth model in SPSS v. 25. The authors also provide the following description of the Level 1 and 2 and combined models.

Level 1

$$Y_{ti} = \pi_{0i} + \pi_{1i} implmentO + \pi_{2i}\, implement1 + \varepsilon_{ti}$$

$\pi_{0i} = initial\ status\ of\ the\ intercept$
$\pi_{1i} = yearly\ rate\ of\ change\ prior\ to\ PBF\ implementation$
$\pi_{2i} = yearly\ rate\ of\ change\ after\ PBF\ implementation$
$\varepsilon_{ti} = error\ in\ each\ institution's\ growth\ trajectory$

Level 2

$$\pi_{0i} = \beta_{00} + \mu_{0i}$$
$$\pi_{1i} = \beta_{10}$$
$$\pi_{2i} = \beta_{20}$$

$\beta_{10}\ and\ \beta_{20} = pre\ and\ post\ PBF\ implmentation\ intercepts$
$\mu_{0i} = random\ initial\ status\ intercept$

Combined

$$Y_{ti} = \beta_{00i} + \beta_{10i} implement0_{ti} + \beta_{20i}\, implement1_{ti} + \mu_{0i} + \varepsilon_{ti}$$

A second growth model was also fitted using Index1 and Implement1 as predictors to identify a change in slope after PBF implementation.

$$Y_{ti} = \beta_{00i} + \beta_{10i} Index1_{ti} + \beta_{20i}\, implement1_{ti} + \mu_{0i} + \varepsilon_{ti}$$

Finally, both models were applied to the institution-level to examine the individual institution growth trajectories and to signal what if any changes in slope occurred after the implementation of PBF.

Chapter Summary

Chapter III was a review of the research design for this non-experimental, exploratory study. The population, data sources, and a listing of the variables under study are provided. The methods to be used to answer the four research questions were also described. These methods include the generation of descriptive statistics and line graphs, Pearson-product-moment correlations and piecewise growth models. The results from these methods are detailed in Chapter IV. When examining the results, the researcher cautions against inferring causation from the implementation of PBF.

CHAPTER IV:

RESULTS

The purpose of this study was to determine what changes if any occurred regarding student access to and success within the FLSUS coincident to the implementation of PBF. Specifically, this study focused on access of underrepresented minorities and students from lower socioeconomic backgrounds to FLSUS institutions. Additionally, the analysis of the data focused on any differences between the FLSUS institutions in regard to their access rates and how they relate to their individual institutional success rates on outcome metrics, as measured by the 6-year graduation and 1st-year retention rate. Because of the non-experimental nature of the study any results that follow should be viewed guardedly as causation is not meant to be inferred.

Research Question I

Research Question I, what are the trends in the data at both the state and institution-level coincident with the implementation of PBF, was answered using descriptive statistics and is presented here in both tabled and graphical formats.

Outcome Metrics. The analysis of the trends in the outcome metrics, 6-year graduation rates and 1st-year retention rates are provided in Figures 2 through 7 and Tables 8 through 11. Figure 2 shows 6-year graduations rates at the FLSUS-level have increased +4% points since PBF implementation but rates were already on the raise prior to implementation. Between the 2001 cohort and the 2007 cohort, 6-year graduation rates within the FLSUS increased +6% points. According to Ginder, Kelly-Reid, and Mann (2018), the national 6-year graduation rate for the 2011 cohort was 60.4%. The FLSUS 6-year graduation rate met this mark with the 2003 cohort and has been increasing with each subsequent cohort.

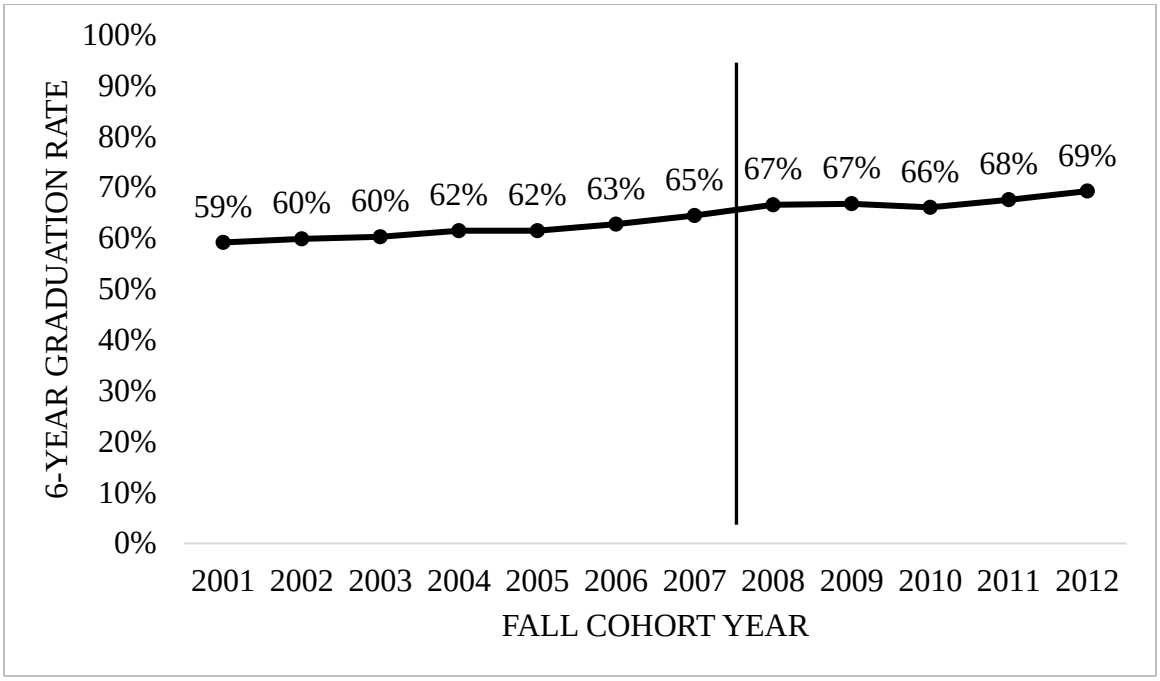

Figure 2. FLSUS 6-year graduation rates before and after PBF implementation.

At the FLSUS institution level, 6-year graduation rates increased at all institutions when comparing the most recent cohort year to the year prior to PBF implementation. However, UWF data showed a decreasing rate since PBF implementation. They fell from a 2008 cohort rate of 51% to a 2012 cohort rate of 43%. FAU and FSU were the only two institutions to increase their rates every year since PBF was implemented, as shown in Figures 3 and 4 and Table 8.

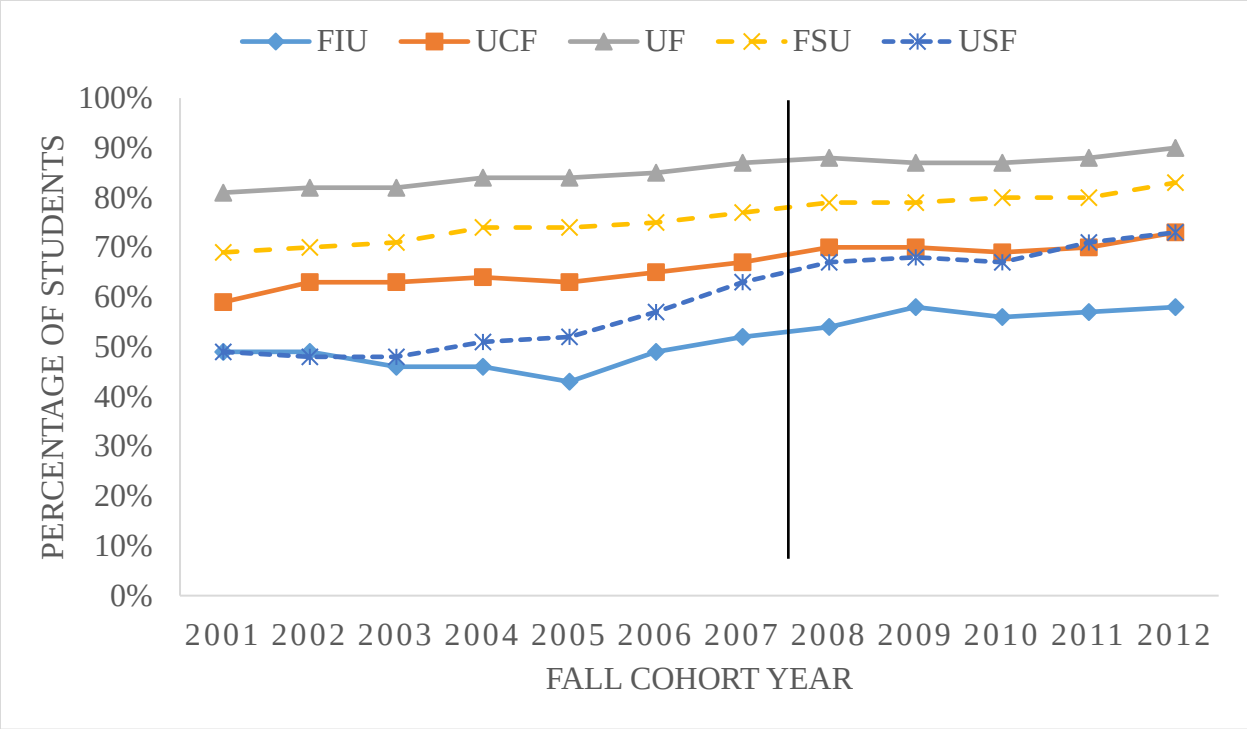

Figure 3. FLSUS 6-year graduation rates before and after PBF implementation at Highest Research Carnegie Classification institutions.

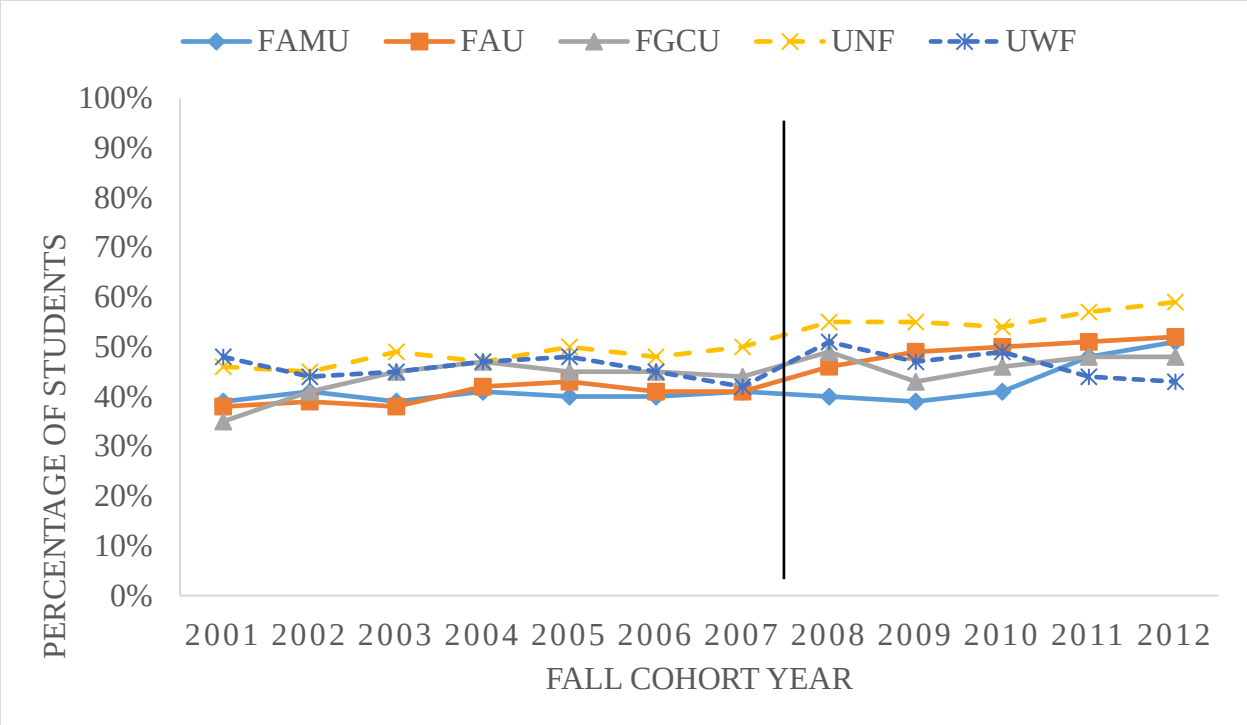

Figure 4. FLSUS 6-year graduation rates before and after PBF implementation at High Research and lower Carnegie Classification institutions.

Table 8

6-year Graduation Rates Before and After PBF Implementation at FLSUS Institutions

	Cohorts Who Entered Prior to PBF Implementation							*Cohorts Entered After PBF Implementation*				
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Florida Agricultural & Mechanical University	39%	41%	39%	41%	40%	40%	41%	40%	39%	41%	48%	51%
Florida Atlantic University	38%	39%	38%	42%	43%	41%	41%	46%	49%	50%	51%	52%
Florida Gulf Coast University	35%	41%	45%	47%	45%	45%	44%	49%	43%	46%	48%	48%
Florida International University	49%	49%	46%	46%	43%	49%	52%	54%	58%	56%	57%	58%
Florida State University	69%	70%	71%	74%	74%	75%	77%	79%	79%	80%	80%	83%
University of Central Florida	59%	63%	63%	64%	63%	65%	67%	70%	70%	69%	70%	73%
University of Florida	81%	82%	82%	84%	84%	85%	87%	88%	87%	87%	88%	90%
University of North Florida	46%	45%	49%	47%	50%	48%	50%	55%	55%	54%	57%	59%
University of South Florida	49%	48%	48%	51%	52%	57%	63%	67%	68%	67%	71%	73%
University of West Florida	48%	44%	45%	47%	48%	45%	42%	51%	47%	49%	44%	43%

Shaded cells indicate a decrease over the previous year.

Table 9

Descriptive Statistics of 6-year Graduation Rates Prior to and After PBF Implementation by FLSUS Institution

	Years Prior to PBF Implementation				*After PBF Implementation*			
	M	SD	Min	Max	M	SD	Min	Max
Florida Agricultural & Mechanical University	40%	.009	39%	41%	44%	.053	39%	51%
Florida Atlantic University	40%	.020	38%	43%	50%	.024	46%	52%
Florida Gulf Coast University	43%	.040	35%	47%	47%	.024	43%	49%
Florida International University	47%	.030	43%	52%	57%	.016	54%	58%
Florida State University	73%	.029	69%	77%	80%	.016	79%	83%
University of Central Florida	63%	.024	59%	67%	70%	.013	69%	73%
University of Florida	84%	.021	81%	87%	88%	.012	87%	90%
University of North Florida	48%	.020	45%	50%	56%	.019	54%	59%
University of South Florida	53%	.056	48%	63%	69%	.028	67%	73%
University of West Florida	46%	.022	42%	48%	47%	.032	43%	51%

As shown in Figure 5, 1st-year retention rates at the FLSUS level have moved up and down 1% point throughout the study's time frame, 2007 to 2017. Since the year prior to PBF implementation, the rate increased 3% points (86% compared to 89%). According to the National Center for Education Statistics (2019), 81% of FTIC students who enrolled at public 4-year degree-granting institutions nationally were retained from fall 2016 to fall 2017. This national rate rose to 96% when the population was reduced to those attending highly selective (25% or fewer applicants accepted) institutions.

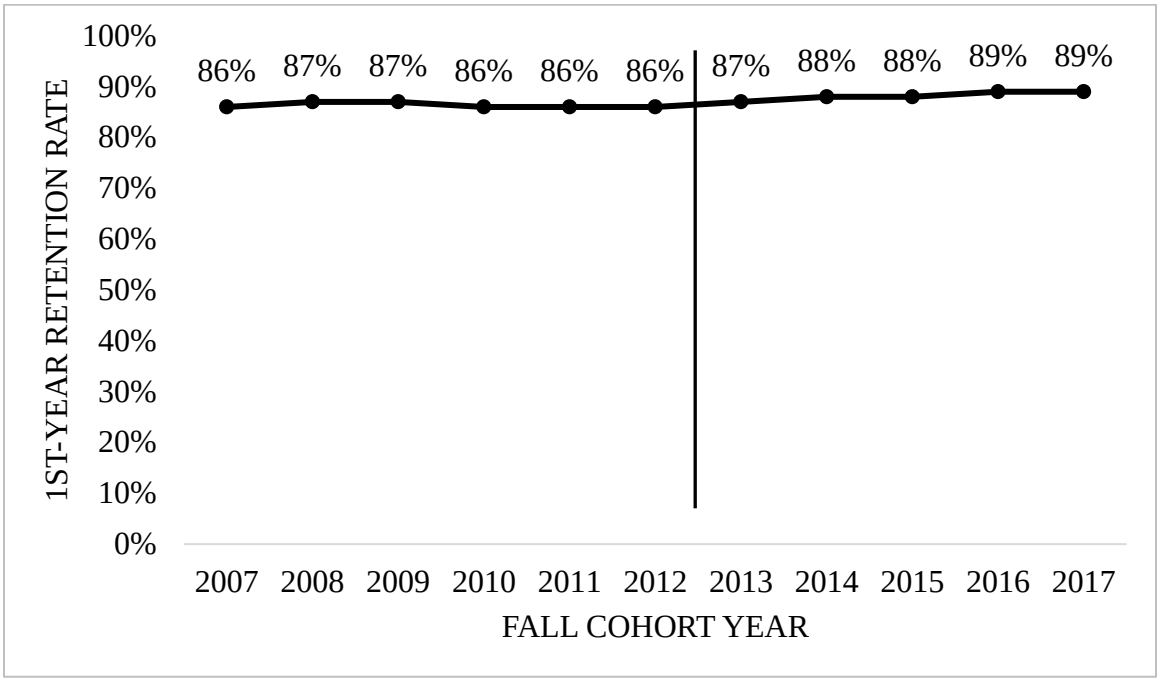

Figure 5. FLSUS 1st-year retention rates before and after PBF implementation

The trend in the rates at the individual institutions are provided graphically for visual inspection in Figure 6 and 7. By examining the Highest Research Carnegie Classification institutions versus those with High or lower classifications, we can see the difference in trend between the two types of institutions. Higher Research Carnegie Classification institutions remained relatively flat after PBF implementation, except for FIU, while High Research and

lower classified institutions showed more variability in their retention rates year over year, both before and after PBF implementation. As shown in Table 11, all FLSUS institutions improved their average retention rates after PBF implementation when compared to the average during the time frame prior to the PBF implementation. FSU and UF both had averages above 90% prior to and after PBF implementation. UF met the national average of highly selective institutions, 96% (National Center for Education Statistics, 2019), both before and after PBF implementation. Table 10 shows all FLSUS institutions improved their retention rates when comparing the final year of study, 2017, to the year prior to PBF implementation except for FAMU, who was -1% lower than the 2012 rate, and UNF who stayed at 82% (+/-0%). Only two schools, FIU and UCF were able to improve or remain at the prior year's rate every year after PBF implementation.

Access Metrics. Three variables were included for study to examine the trends in the data of access to FLSUS institutions. These variables include the percentage of applications accepted by institutions, referred to here as the acceptance rate. Also included here are the average high school weighted GPA of the FTIC students who were accepted and enrolled at the FLSUS institutions, as well as the 25^{th} and 75^{th} percentile SAT critical reading and math scores. It should be noted that the GPA and SAT data were not available at the FLSUS level, only at the institution level.

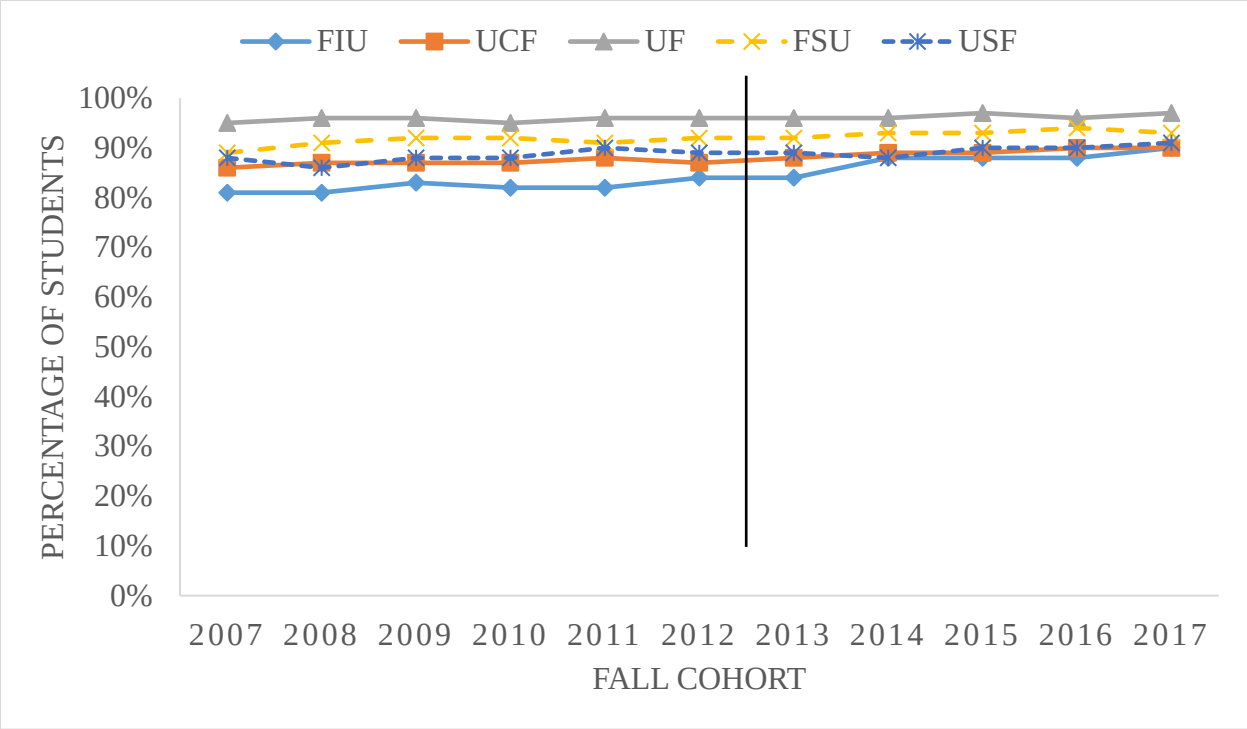

Figure 6. FLSUS 1st- year retention rates before and after PBF implementation at Highest Research Carnegie Classification institutions.

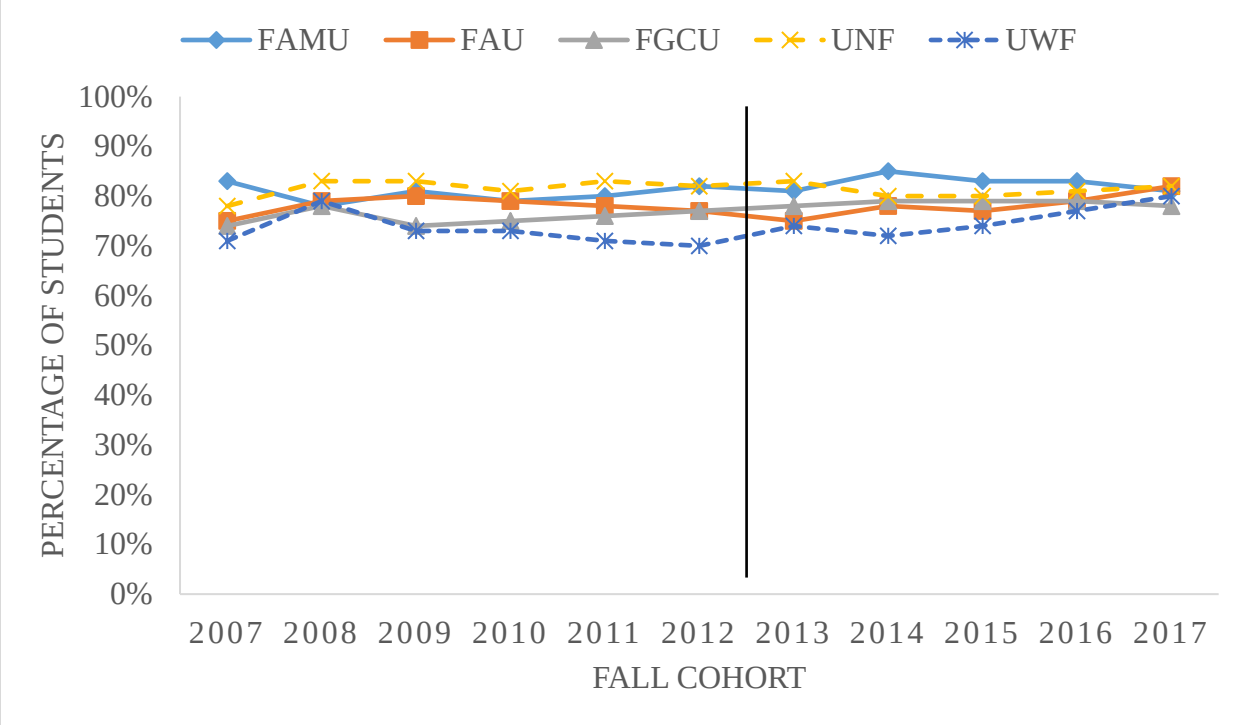

Figure 7. FLSUS 1st- year retention rates before and after PBF implementation at High Research and lower Carnegie Classification institutions.

Table 10

1st-year Retention Rates Before and After PBF Implementation at FLSUS Institutions

	Years Prior to PBF Implementation						*Years After PBF Implementation*				
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Florida Agricultural & Mechanical University	83%	78%	81%	79%	80%	82%	81%	85%	83%	83%	81%
Florida Atlantic University	75%	79%	80%	79%	78%	77%	75%	78%	77%	79%	82%
Florida Gulf Coast University	74%	78%	74%	75%	76%	77%	78%	79%	79%	79%	78%
Florida International University	81%	81%	83%	82%	82%	84%	84%	88%	88%	88%	90%
Florida State University	89%	91%	92%	92%	91%	92%	92%	93%	93%	94%	93%
University of Central Florida	86%	87%	87%	87%	88%	87%	88%	89%	89%	90%	90%
University of Florida	95%	96%	96%	95%	96%	96%	96%	96%	97%	96%	97%
University of North Florida	78%	83%	83%	81%	83%	82%	83%	80%	80%	81%	82%
University of South Florida	88%	86%	88%	88%	90%	89%	89%	88%	90%	90%	91%
University of West Florida	71%	79%	73%	73%	71%	70%	74%	72%	74%	77%	80%

Shaded cells indicate a decrease over the previous year.

Table 11

Descriptive Statistics of 1st-year Retention Prior to and After PBF Implementation by FLSUS Institution

	Years Prior to PBF Implementation				*Years After PBF Implementation*			
	M	SD	Min	Max	M	SD	Min	Max
Florida Agricultural & Mechanical University	80.7%	.018	78%	83%	82.6%	.017	81%	85%
Florida Atlantic University	77.4%	.022	74%	80%	78.2%	.026	75%	82%
Florida Gulf Coast University	75.7%	015	74%	78%	78.6%	.005	78%	79%
Florida International University	81.4%	.013	81%	84%	87.6%	.022	84%	90%
Florida State University	90.9%	.013	89%	92%	93.0%	.007	92%	94%
University of Central Florida	86.6%	.013	84%	88%	89.2%	.008	88%	90%
University of Florida	95.6%	.005	95%	96%	96.4%	.005	96%	97%
University of North Florida	81.0%	.025	77%	83%	81.2%	.013	80%	83%
University of South Florida	87.1%	.871	81%	90%	89.6%	.011	88%	91%
University of West Florida	72.9%	.030	70%	79%	75.4%	.031	72%	80%

Figure 8 shows the acceptance rate of FTIC students at all FLSUS institutions. Prior to PBF implementation, the 2011 cohort had the lowest rate at which students were accepted at 45% of applicants. After PBF implementation the rate began to increase but has fallen or remained constant over the last three cohorts. According to Ginder, Kelly-Reid, and Mann (2018), nationally 4-year public institutions that do not have an open admissions policy were accepting 61% of applicants from the fall 2017 cohort compared to 50% of applicants to FLSUS institutions.

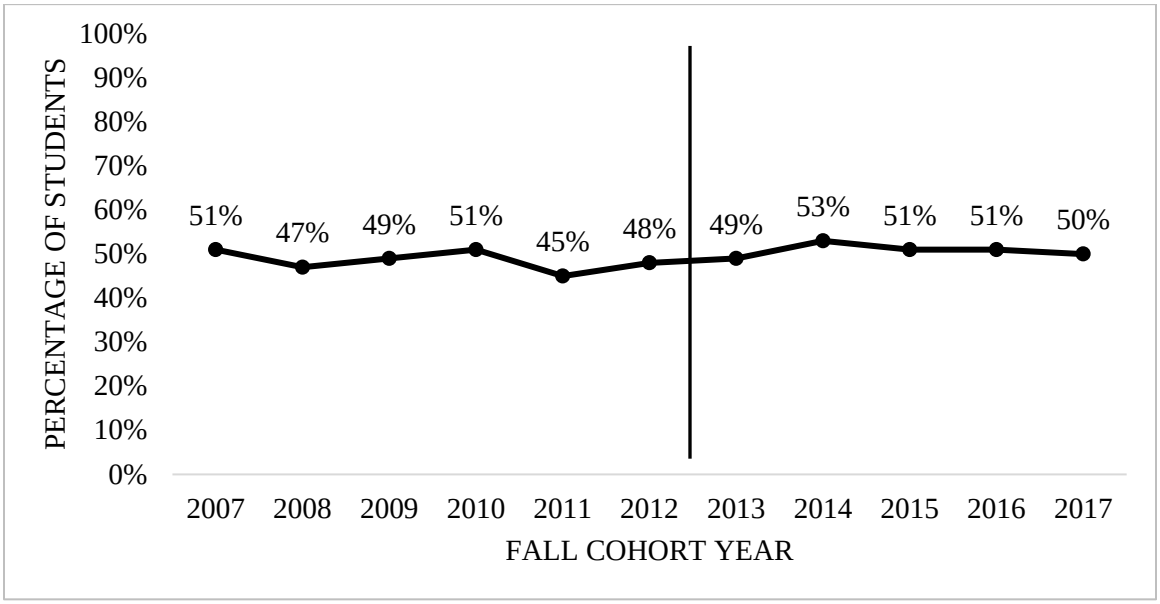

Figure 8. Percentage of FTIC applications accepted by the FLSUS before and after PBF implementation.

Figures 9 and 10 show fluctuation in acceptance rates across the FLSUS institutions prior to and after PBF implementation. This variability is also evident in the standard deviations of the average acceptance as shown in Table 13. Also notable in the average application acceptance rates at each of the FLSUS institutions prior to and after PBF implementation was the large decreases at UWF (-23%), FAMU (-11%), and FGCU (-8%) when comparing the years after PBF implementation to the years prior. Average rates of acceptance increased at the other universities, except FSU who saw a 1% drop in their rate. FAU (+13%) and FIU (+7%) had the

largest increases in their average acceptance rates. A shown in Table 12, for the most recent cohort, 2017, FGCU (64%) accepted the most FTIC applicants and UF (42%) accepted the least.

It should be noted, yearly acceptance rates for FAMU during 2007 and 2008 and for UWF in 2011 were not available in the IPEDS.

As shown in Table 14, the entering high school weighted GPA of FTIC students enrolling in the FLSUS institutions increased over the study period across the entire FLSUS. Figures 11 and 12 show steeper inclines in the average GPA scores at the High Research and lower Carnegie Classification institutions. Table 14 shows changes year over year in weighted GPAs, before and after PBF implementation. Of note, only two schools had average entering GPAs of 4.00 or higher the year prior to PBF implementation. That number has increased to six or more than half of the FLSUS institutions who have an average weighted GPA of 4.00 or higher in the 2017 cohort. All institutions have increased or held to the average of the year before throughout the study timeframe. As shown in Table 15, when comparing the average over the years prior to PBF implementation and the years after, FAU saw the largest increase in average weighted GPAs increasing from a 3.38 to a 3.85, a +0.47-point increase. FGCU (+0.32), FAMU (+0.25), and UNF (+0.25) had the next largest average increases. Since PBF implementation, no FLSUS institution has decreased in their average.

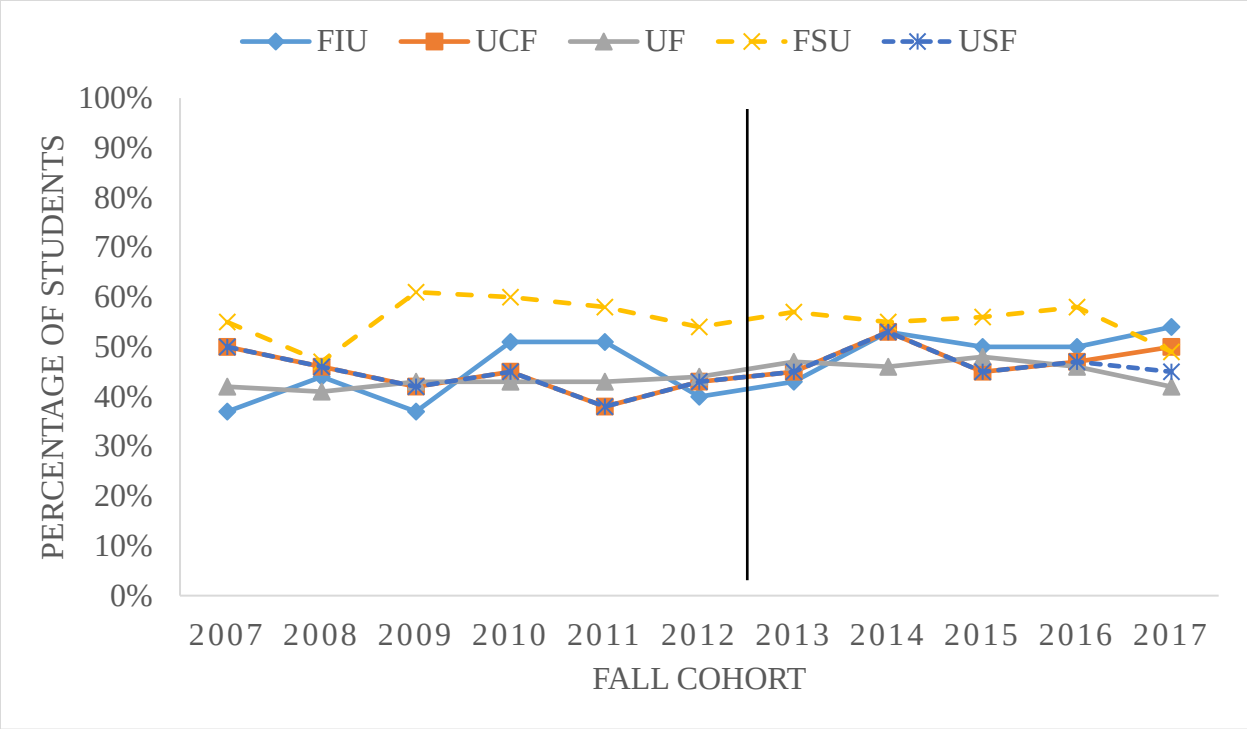

Figure 9. FLSUS acceptance rates before and after PBF implementation Highest Research Carnegie Classification institutions.

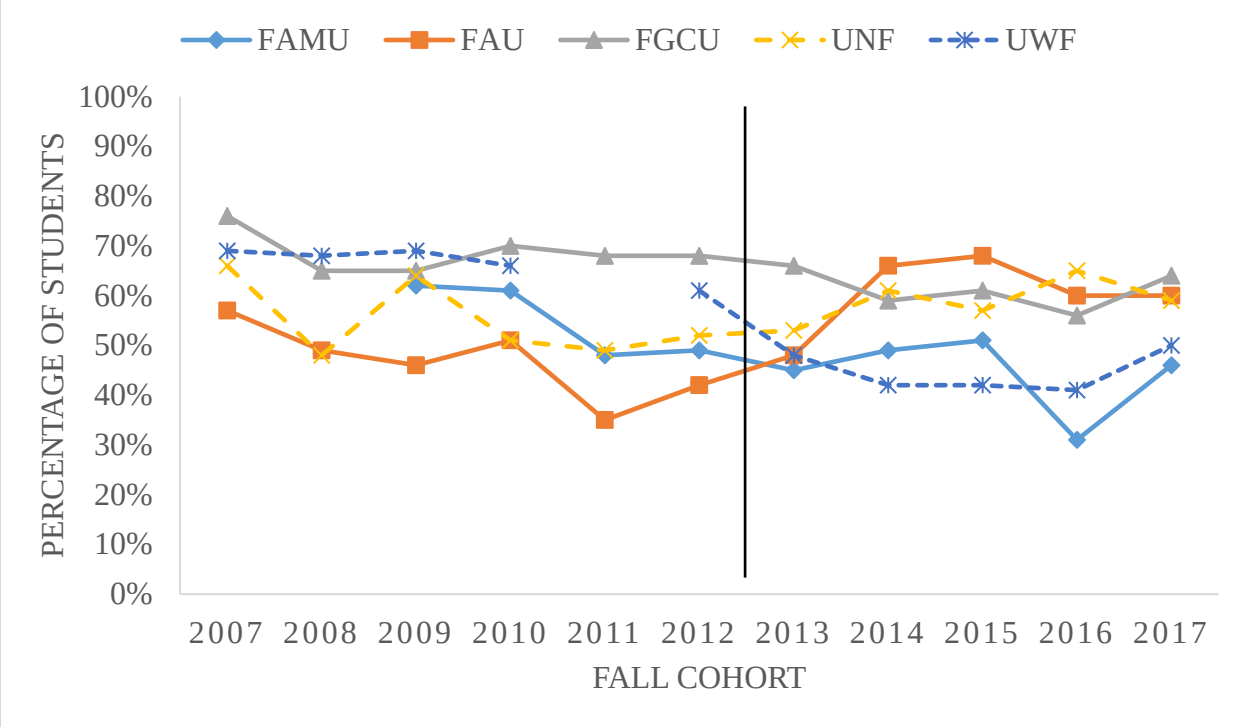

Figure 10. FLSUS acceptance rates before and after PBF implementation High Research and lower Carnegie Classification institutions.

Table 12

Rates of Acceptance at FLSUS Institutions in the Years Prior to and After PBF Implementation

	Years Prior to PBF Implementation						*Years After PBF Implementation*				
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Florida Agricultural & Mechanical University	*	*	62%	61%	48%	49%	45%	49%	51%	31%	46%
Florida Atlantic University	57%	49%	46%	51%	35%	42%	48%	66%	68%	60%	60%
Florida Gulf Coast University	76%	65%	65%	70%	68%	68%	66%	59%	61%	56%	64%
Florida International University	37%	44%	37%	51%	51%	40%	43%	53%	50%	50%	54%
Florida State University	55%	47%	61%	60%	58%	54%	57%	55%	56%	58%	49%
University of Central Florida	50%	46%	42%	45%	38%	43%	45%	53%	45%	47%	50%
University of Florida	42%	41%	43%	43%	43%	44%	47%	46%	48%	46%	42%
University of North Florida	66%	48%	64%	51%	49%	52%	53%	61%	57%	65%	59%
University of South Florida	50%	46%	42%	45%	38%	43%	45%	53%	45%	47%	45%
University of West Florida	69%	68%	69%	66%	*	61%	48%	42%	42%	41%	50%

Note * signifies data was not available in the IPEDS for the reporting year.
Shaded cells indicate a decrease over the previous year.

Table 13

Descriptive Statistics of Acceptance Rates Prior to and After PBF Implementation by FLSUS Institution

	Years Prior to PBF Implementation				*Years After PBF Implementation*			
	M	SD	Min	Max	M	SD	Min	Max
Florida Agricultural & Mechanical University	55%	.074	48%	62%	44%	.079	31%	51%
Florida Atlantic University	47%	.075	35%	57%	60%	.078	48%	68%
Florida Gulf Coast University	69%	.041	65%	76%	61%	.039	56%	66%
Florida International University	43%	.063	37%	51%	50%	.043	43%	54%
Florida State University	56%	.052	47%	61%	55%	.034	49%	58%
University of Central Florida	44%	.038	38%	50%	48%	.036	45%	53%
University of Florida	43%	.009	41%	44%	46%	.021	42%	48%
University of North Florida	55%	.079	48%	66%	59%	.042	53%	65%
University of South Florida	44%	.038	38%	50%	47%	.035	45%	53%
University of West Florida	67%	.035	61%	69%	44%	.041	41%	50%

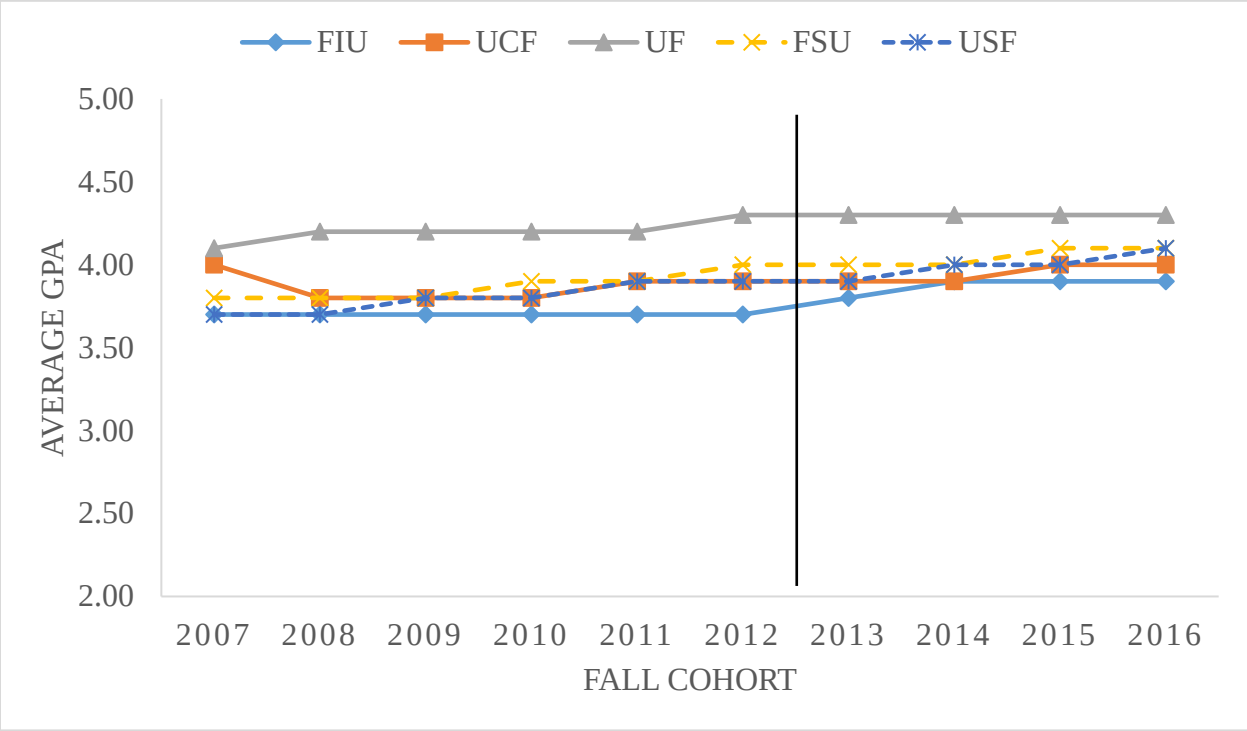

Figure 11. FLSUS average entering high school weighted GPA of FTIC students before and after PBF implementation Highest Research Carnegie Classification institutions.

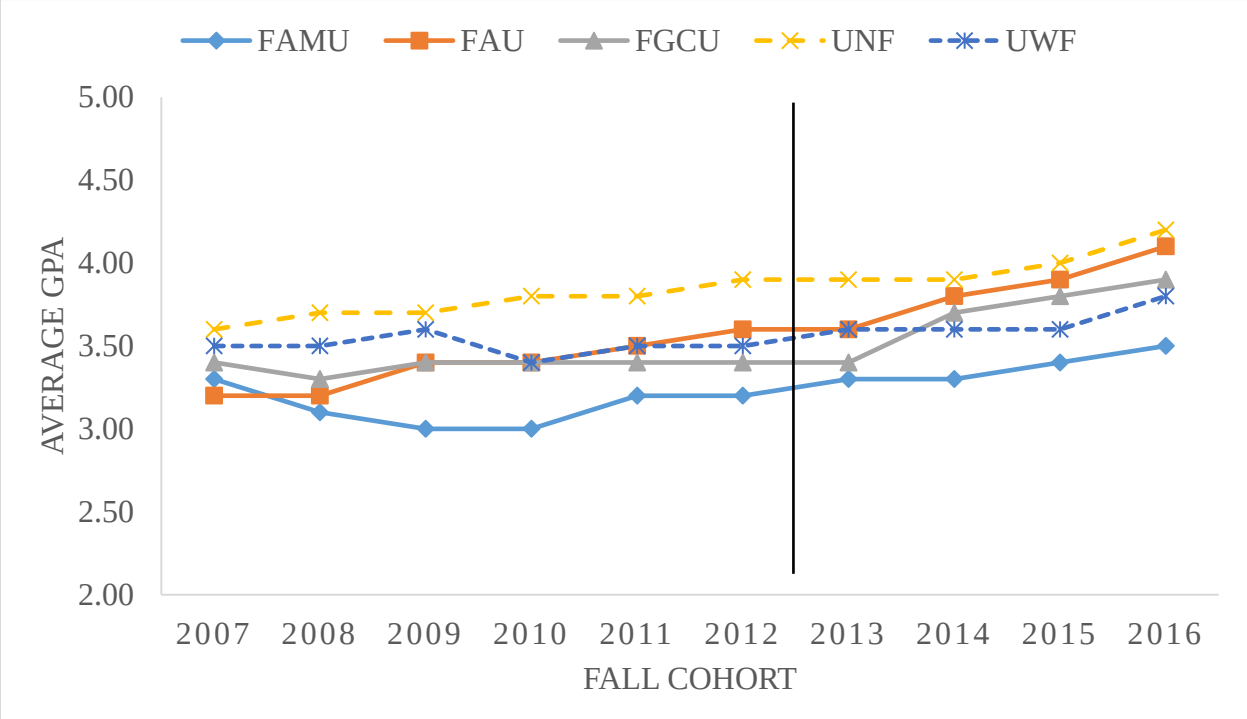

Figure 12. FLSUS average entering high school weighted GPA of FTIC students before and after PBF implementation High Research and lower Carnegie Classification institutions.

Table 14

Average Entering High School Weighted GPA of FTIC Students at FLSUS Institutions Prior to and After PBF Implementation

	Years Prior to PBF Implementation						*Years After PBF Implementation*			
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Florida Agricultural & Mechanical University	3.30	3.10	3.00	3.00	3.20	3.20	3.30	3.30	3.40	3.50
Florida Atlantic University	3.20	3.20	3.40	3.40	3.50	3.60	3.60	3.80	3.90	4.10
Florida Gulf Coast University	3.40	3.30	3.40	3.40	3.40	3.40	3.40	3.70	3.80	3.90
Florida International University	3.70	3.70	3.70	3.70	3.70	3.70	3.80	3.90	3.90	3.90
Florida State University	3.80	3.80	3.80	3.90	3.90	4.00	4.00	4.00	4.10	4.10
University of Central Florida	4.00	3.80	3.80	3.80	3.90	3.90	3.90	3.90	4.00	4.00
University of Florida	4.10	4.20	4.20	4.20	4.20	4.30	4.30	4.30	4.30	4.30
University of North Florida	3.60	3.70	3.70	3.80	3.80	3.90	3.90	3.90	4.00	4.20
University of South Florida	3.70	3.70	3.80	3.80	3.90	3.90	3.90	4.00	4.00	4.10
University of West Florida	3.50	3.50	3.60	3.40	3.50	3.50	3.60	3.60	3.60	3.80

Shaded cells indicate a decrease over the previous year.

Table 15

Descriptive Statistics of Entering FTIC Student High School Weighted GPA Prior to and After PBF Implementation by FLSUS Institution

	Years Prior to PBF Implementation				*Years After PBF Implementation*			
	M	SD	Min	Max	M	SD	Min	Max
Florida Agricultural & Mechanical University	3.13	.121	3.00	3.30	3.38	.096	3.30	3.50
Florida Atlantic University	3.38	.160	3.20	3.60	3.85	.208	3.60	4.10
Florida Gulf Coast University	3.38	.041	3.30	3.40	3.70	.216	3.40	3.90
Florida International University	3.70	.000	3.70	3.70	3.88	.050	3.80	3.90
Florida State University	3.87	.082	3.80	4.00	4.05	.058	4.00	4.10
University of Central Florida	3.87	.082	3.80	4.00	3.95	.058	3.90	4.00
University of Florida	4.20	.063	4.10	4.30	4.30	.000	4.30	4.30
University of North Florida	3.75	.105	3.60	3.90	4.00	.141	3.90	4.20
University of South Florida	3.80	.089	3.70	3.90	4.00	.082	3.90	4.10
University of West Florida	3.50	.063	3.40	3.60	3.65	.100	3.60	3.80

Figures 13 through 16 and Tables 16 through 19 show the trends in the SAT scores of entering FTIC students who were accepted and enrolled by FLSUS institutions. The scores are provided by the 25th and 75th percentile for both the critical reading section and the math section of the SAT. SAT scores can range from 200 to 800 per section.

Figures 13 through 16 provide a graphical depiction of the trends in SAT scores over the study period. Notable is the most recent cohort, 2017, figures for both critical reading and math which show a visible jump in the average scores at both the 25th and 75th percentile. As shown in Table 16 and 17, every 2017 cohort from each FLSUS institution except FAMU reported a 75th percentile average at or above 600 points for critical reading and math. UF reached over 700 at the 75th percentile in critical reading scores. Critical reading scores at both the 25th and 75th percentile showed larger increases than math scores at all FLSUS institutions except FIU. Scores increased from 20 to 70-points at the 25th percentile and 30 to 60-points at the 75th percentile when comparing the first year of PBF implementation to the last year. The math scores showed much more variance in change.

The largest increases in average 25th and 75th percentile scores for both critical reading and math scores averaged in the years before and after PBF implementation were from FAMU, FGCU, and USF as shown in Tables 17 and 19. Their critical reading scores increased +25, +31, and +23-points respectively at the 25th percentile and +33, +26, and +11-points at the 75th percentile. Their math scores increased +20, +16, and +18-points respectively at the 25th percentile and +15, +8, and +10-points respectively at the 75th percentile.

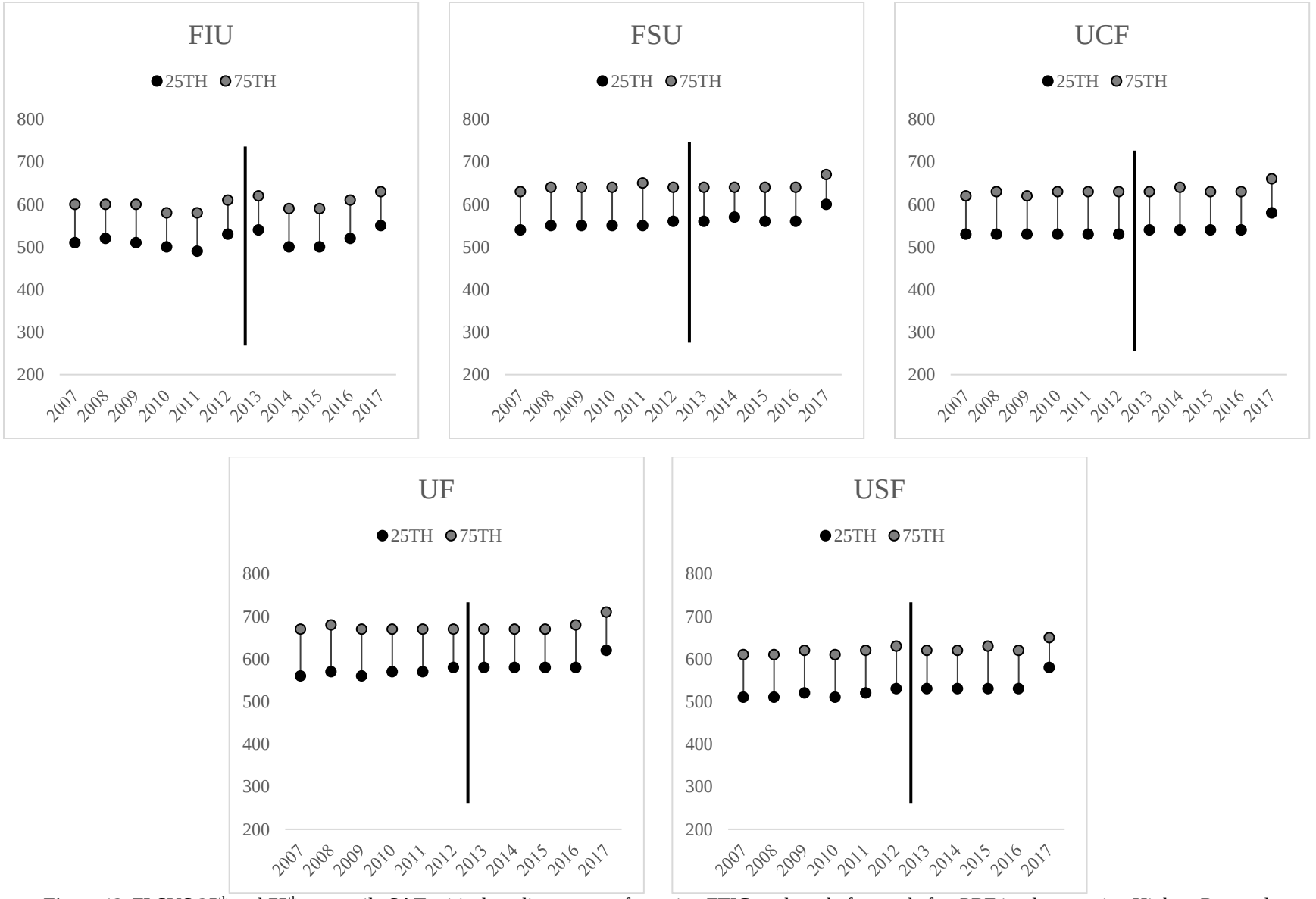

Figure 13. FLSUS 25th and 75th percentile SAT critical reading scores of entering FTIC students before and after PBF implementation Highest Research Carnegie Classification institutions.

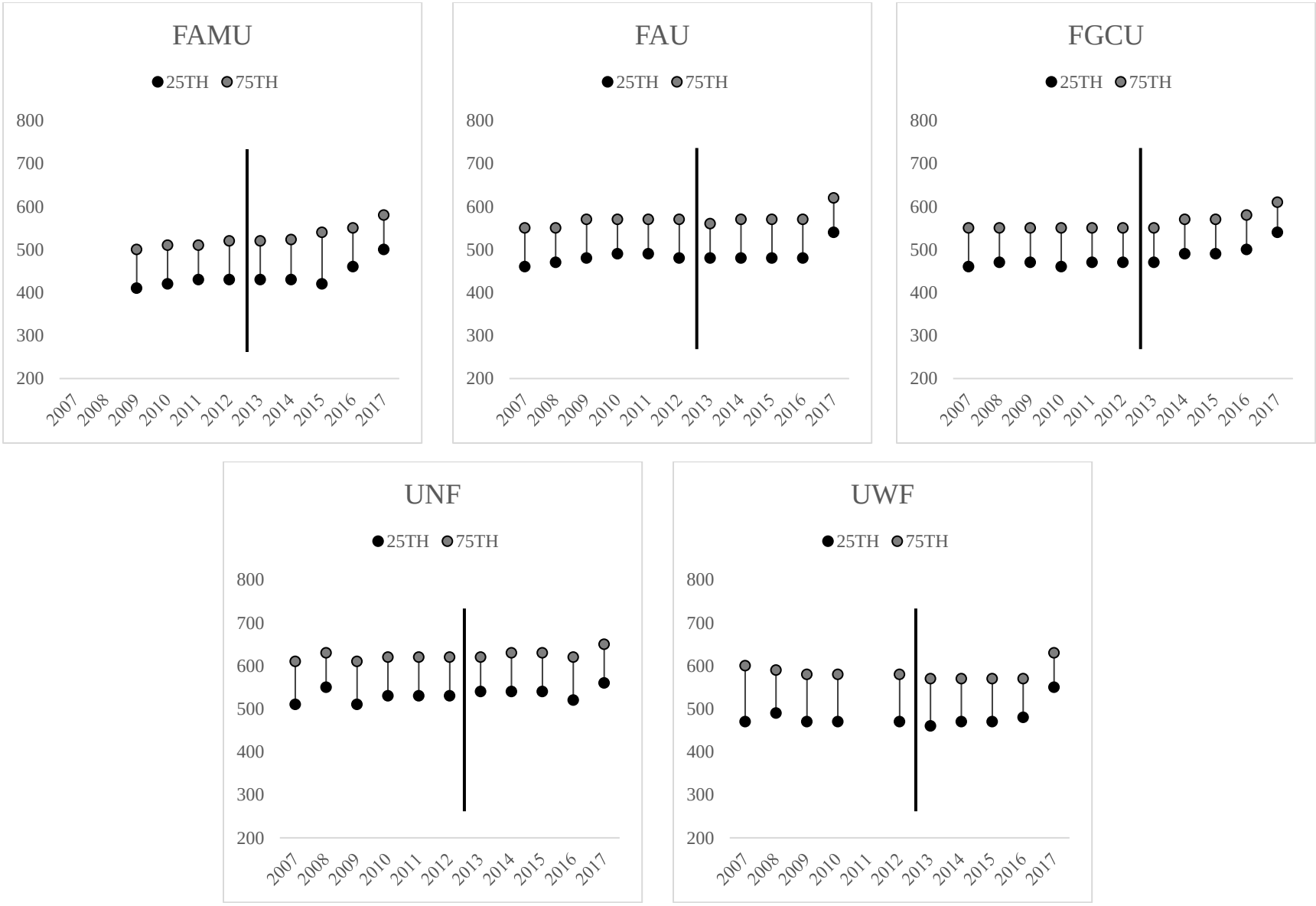

Figure 14. FLSUS 25th and 75th percentile SAT critical reading scores of entering FTIC students before and after PBF implementation High Research and lower Carnegie Classification institutions.

Table 16

25th and 75th Percentile SAT Critical Reading Scores of Entering FTIC Students at FLSUS Institutions Prior to and After PBF Implementation

	Years Prior to PBF Implementation						*Years After PBF Implementation*				
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Florida Agricultural & Mechanical University			410-500	420-510	430-510	430-520	430-520	430-523	420-540	460-550	500-580
Florida Atlantic University	460-550	470-550	480-570	490-570	490-570	480-570	480-560	480-570	480-570	480-570	540-620
Florida Gulf Coast University	460-550	470-550	470-550	460-550	470-550	470-550	470-550	490-570	490-570	500-580	540-610
Florida International University	510-600	520-600	510-600	500-580	490-580	530-610	540-620	500-590	500-590	520-610	550-630
Florida State University	540-630	550-640	550-640	550-640	550-650	560-640	560-640	570-640	560-640	560-640	600-670
University of Central Florida	530-620	530-630	530-620	530-630	530-630	530-630	540-630	540-640	540-630	540-630	580-660
University of Florida	560-670	570-680	560-670	570-670	570-670	580-670	580-670	580-670	580-670	580-680	620-710
University of North Florida	510-610	550-630	510-610	530-620	530-620	530-620	540-620	540-630	540-630	520-620	560-650
University of South Florida	510-610	510-610	520-620	510-610	520-620	530-630	530-620	530-620	530-630	530-620	580-650
University of West Florida	470-600	490-590	470-580	470-580		470-580	460-570	470-570	470-570	480-570	550-630

Table 17

Descriptive Statistics of 25th and 75th Percentile SAT Critical Reading Scores of Entering FTIC Students Prior to and After PBF Implementation by FLSUS Institution

	Years Prior to PBF Implementation				*Years After PBF Implementation*			
	M	SD	Min	Max	M	SD	Min	Max
Florida Agricultural & Mechanical University	423-510	9.574-8.165	410-500	430-520	448-543	32.711-24.265	420-520	500-580
Florida Atlantic University	478-563	11.690-10.328	460-550	490-570	492-578	26.833-23.875	480-560	540-620
Florida Gulf Coast University	467-550	5.164-.000	460-550	470-550	498-576	25.884-21.909	470-550	540-610
Florida International University	510-595	14.142-12.247	490-580	530-610	522-608	22.804-17.889	500-590	550-630
Florida State University	550-640	6.325-6.325	540-630	560-650	570-646	17.321-13.416	560-640	600-670
University of Central Florida	530-627	.000-5.164	530-620	530-630	548-638	17.889-13.038	540-630	580-660
University of Florida	568-672	7.528-4.082	560-670	580-680	588-680	17.889-17.321	580-670	620-710
University of North Florida	527-618	15.055-7.528	510-610	550-630	540-630	14.142-12.247	520-620	560-650
University of South Florida	517-617	8.165-8.165	510-610	530-630	540-628	22.361-13.038	530-620	580-650
University of West Florida	474-586	8.944-8.944	470-580	490-600	486-582	36.469-26.833	460-570	550-630

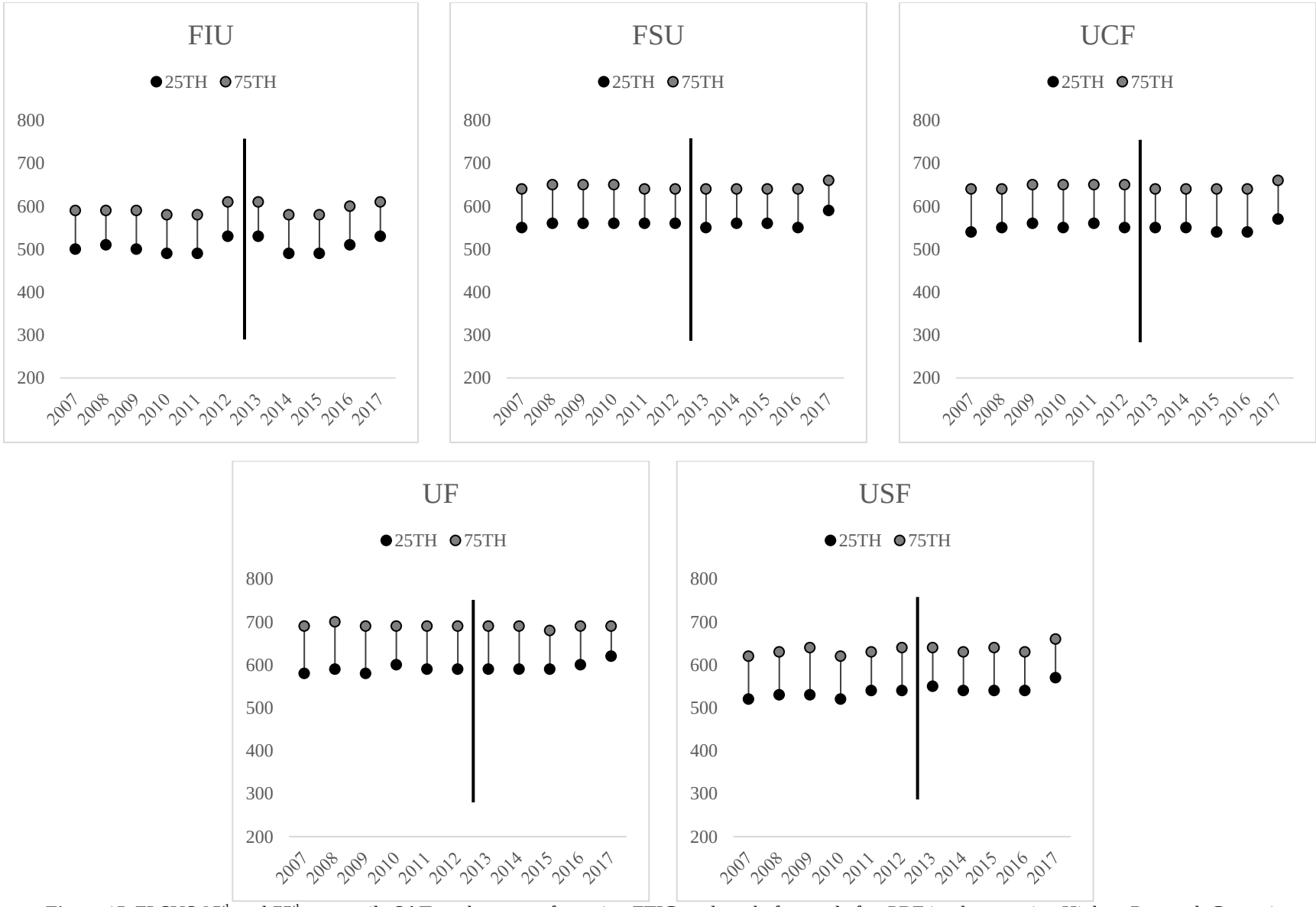

Figure 15. FLSUS 25th and 75th percentile SAT math scores of entering FTIC students before and after PBF implementation Highest Research Carnegie Classification institutions.

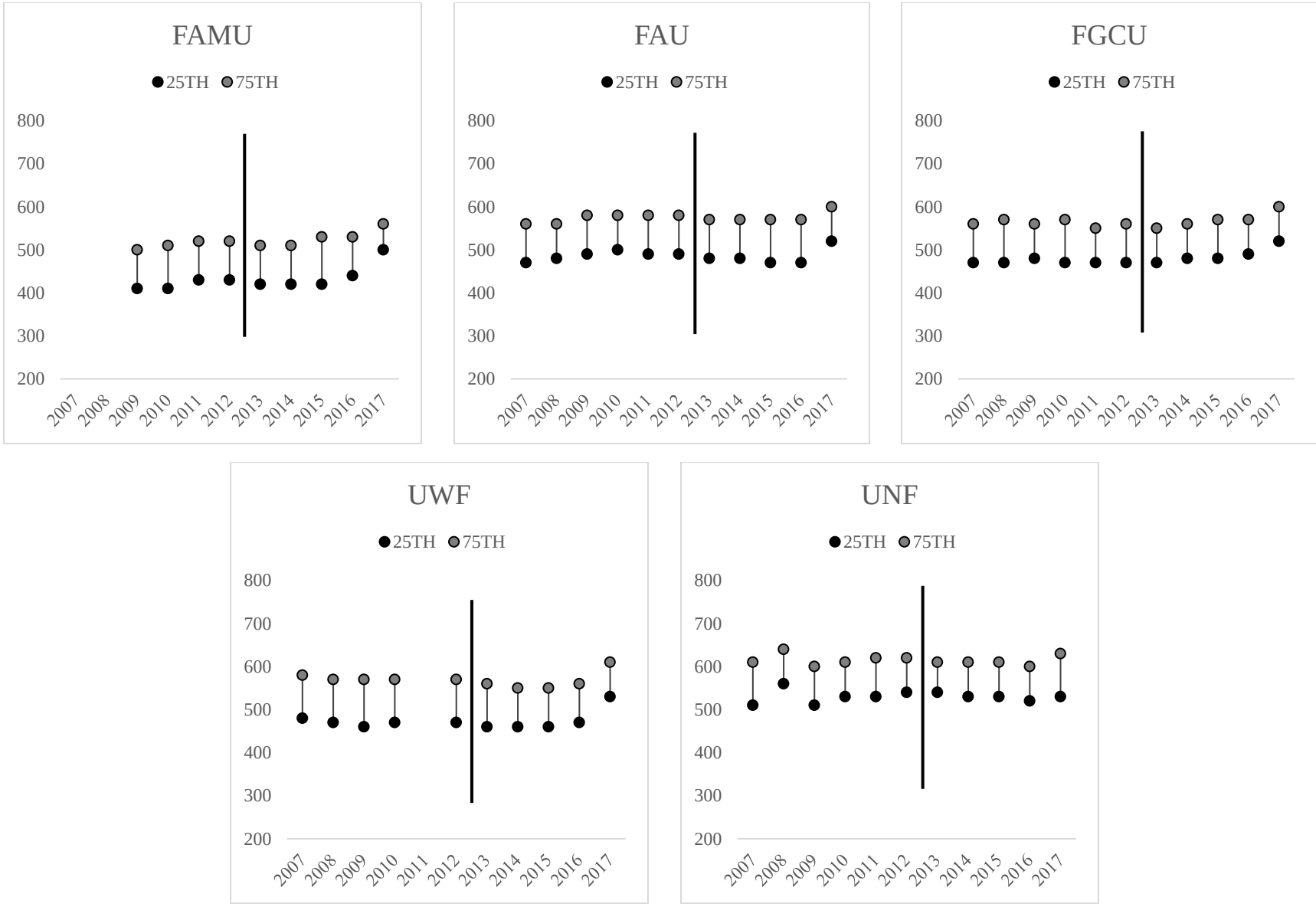

Figure 16. FLSUS 25th and 75th percentile SAT math scores of entering FTIC students before and after PBF implementation High Research and lower Carnegie Classification institutions.

Table 18

25th and 75th Percentile SAT Math Scores of Entering FTIC Student at FLSUS Institutions Prior to and After PBF Implementation

	Years Prior to PBF Implementation						*Years After PBF Implementation*				
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Florida Agricultural & Mechanical University			410-500	410-510	430-520	430-520	420-510	420-510	420-530	440-530	500-560
Florida Atlantic University	470-560	480-560	490-580	500-580	490-580	490-580	480-570	480-570	470-570	470-570	520-600
Florida Gulf Coast University	470-560	470-570	480-560	470-570	470-550	470-560	470-550	480-560	480-570	490-570	520-600
Florida International University	500-590	510-590	500-590	490-580	490-580	530-610	530-610	490-580	490-580	510-600	530-610
Florida State University	550-640	560-650	560-650	560-650	560-640	560-640	550-640	560-640	560-640	550-640	590-660
University of Central Florida	540-640	550-640	560-650	550-650	560-650	550-650	550-640	550-640	540-640	540-640	570-660
University of Florida	580-690	590-700	580-690	600-690	590-690	590-690	590-690	590-690	590-680	600-690	620-690
University of North Florida	510-610	560-640	510-600	530-610	530-620	540-620	540-610	530-610	530-610	520-600	530-630
University of South Florida	520-620	530-630	530-640	520-620	540-630	540-640	550-640	540-630	540-640	540-630	570-660
University of West Florida	480-580	470-570	460-570	470-570		470-570	460-560	460-550	460-550	470-560	530-610

Table 19

Descriptive Statistics 25th and 75th Percentile SAT Math Scores of Entering FTIC Students Prior to and After PBF Implementation by FLSUS Institution

	Years Prior to PBF Implementation				*Years After PBF Implementation*			
	M	SD	Min	Max	M	SD	Min	Max
Florida Agricultural & Mechanical University	420-513	11.55-9.57	410-500	430-520	440-528	34.64-20.49	420-510	500-560
Florida Atlantic University	487-573	10.33-10.33	460-550	490-570	484-576	20.74-13.42	470-570	520-600
Florida Gulf Coast University	472-562	4.08-7.53	470-550	480-570	488-570	19.24-18.71	470-550	520-600
Florida International University	503-590	15.06-10.95	490-580	530-610	510-596	20.00-15.17	490-580	530-610
Florida State University	558-645	4.08-5.48	550-640	560-650	562-644	16.43-8.94	550-640	590-660
University of Central Florida	552-647	7.53-5.16	540-640	560-650	550-644	12.25-8.94	540-640	570-660
University of Florida	588-692	7.53-4.08	580-690	600-700	598-688	13.04-4.47	590-680	620-690
University of North Florida	530-617	18.97-13.66	510-600	560-640	530-612	7.07-10.95	520-600	540-630
University of South Florida	530-630	8.94-8.94	510-610	530-630	548-640	13.04-12.25	540-630	570-660
University of West Florida	470-572	7.07-4.47	460-570	480-580	476-566	30.50-25.10	460-550	530-610

Student Demographic Characteristics. Student demographics provided here are the percentage of students from minority racial backgrounds and those from lower-socioeconomic statuses. Selected variables include percentage of FTIC students who identify as Black, the percentage who identify as Hispanic and the combined percentage of Black, Hispanic, and Native American. The latter group is referred to as "minority" in the following figures and tables. Students from lower-socioeconomic statuses are identified by the percentage of FTIC students who were awarded a Pell Grant. According to the National Center for Education Statistics (NCES, 2019), students who qualify for Pell Grants demonstrate financial need, therefore, making it a good proxy for students who are on the lower end of the socioeconomic spectrum.

Figure 17 depicts the trends in the enrollment of minority students at FLSUS institutions prior to and after PBF implementation. Minority student enrollment has remained flat since PBF implementation. Hispanic student enrollment has increased +3% points from the year prior to PBF implementation to the most recent cohort. Black students, however, have decreased in representation, down -1% point since PBF implementation. These percentages are similar to the national average of minority enrollment but with Florida showing higher averages. Nationally, NCES (2019) reported the undergraduate fall 2017 public 4-year university cohort was made up of 32% minority, 19% Hispanic, 12% Black, and 1% Native American.

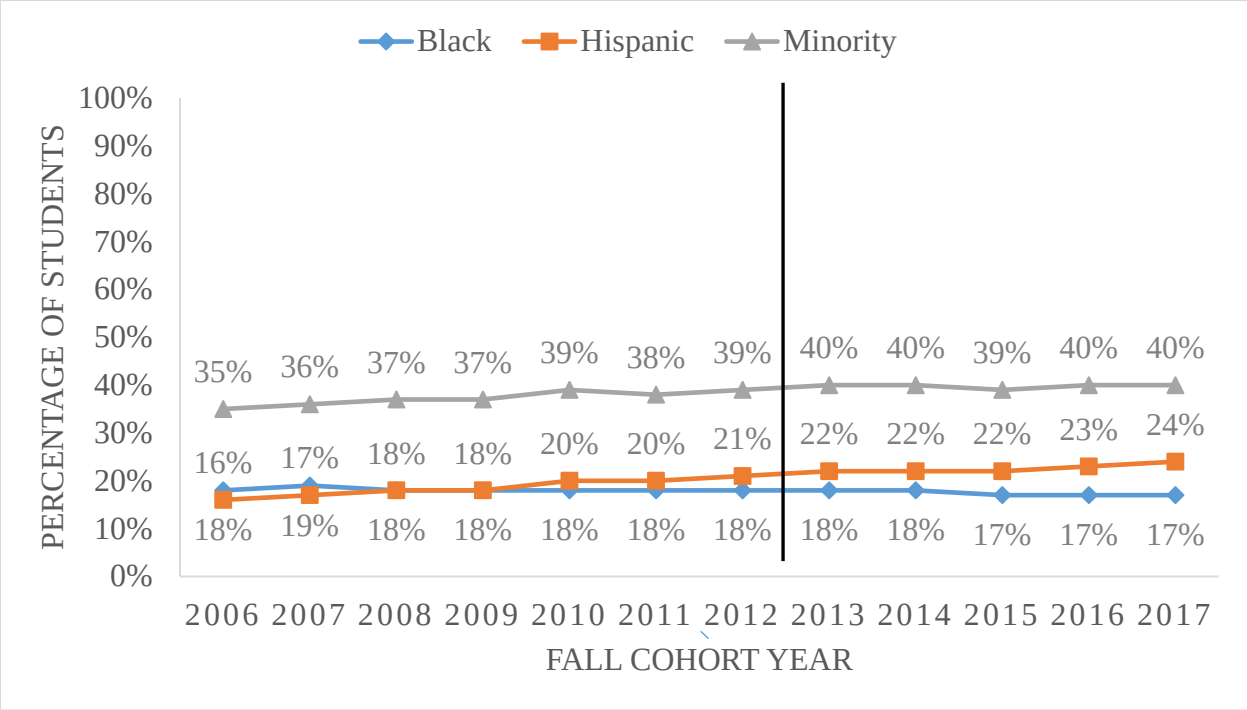

Figure 17. Percentage of FLSUS FTIC students who are Black, Hispanic, or from a minority racial/ethnic group (Black, Hispanic, and Native American) before and after PBF implementation.

Figures 18 through 23 and Tables 20 through 25 show the trends in the enrollment data for the percentage of minority students enrolled at the individual FLSUS institutions. An examination of Figures 18 and 19 provides a visual narrative to the difference in minority enrollment at the three minority serving institutions, FIU, FAMU and FAU. FAMU and FIU are notably different from the other FLSUS institutions. FAU is closer in range but still visibly different than the other High Research and lower Carnegie Classification institutions.

Tables 21, 23, and 25 provide the average percentage of minority, Black, and Hispanic students in the years prior to PBF implementation and the years after implementation. According to the data, all institutions, except FAMU (-4%), which is a Historically Black University (HBCU), and UF (-1%) saw an increase or remained the same in the average percentage of minorities enrolled in the years before and after PBF implementation. The largest increase

occurred at UCF (+8%). In the years after PBF implementation, the average percentage of Hispanic students increased after PBF implementation at all FLSUS institutions when compared to the average of the years prior to PBF implementation, as shown in Table 25. However, as shown in Table 23, the percentage of Black enrollment increased at only three of the institutions, FAU (+2%), FGCU (+1%), and UCF (+1%). When comparing the percentage of minority students the year prior to PBF implementation to the most recently reported cohort, see Table 20, UWF (-8%) showed the largest decrease in the percentage of minorities and was the only institution to show a decrease in Hispanics when comparing these years, as reported in Table 24.

Figures 24 and 25 and Tables 26 and 27 show trends in the percentage of FTIC students who were awarded a Pell Grant prior to and after the implementation of PBF. The visuals provided in Figures 23 and 24 show a steep increase in the percentage of Pell Grant recipients prior to PBF implementation and plateauing and or decreasing in the rates after PBF implementation.

Table 26 shows 7 of the 10 institutions decreased in their percentage of Pell Grant recipients when the year prior to PBF implementation, 2012, is compared to the most recent reporting year, 2017. UWF showed the largest decrease, falling from 45% of FTIC students in 2012 to 35% of students in 2017. FAMU increased its percentage by 3% points, moving their rate up to 71%. In 2017, FAMU had the highest rate in the FLSUS by 20% points. Also, of note and shown in Table 27, the average percentage of Pell Grant recipients increased at all FLSUS institutions except UF when comparing the average of the years prior to PBF implementation to the average of the years after PBF implementation. However, as explained previously, Figures 24 and 25 the rates prior to PBF time period showed percentages rising quickly from study timeframe lows to study timeframe highs.

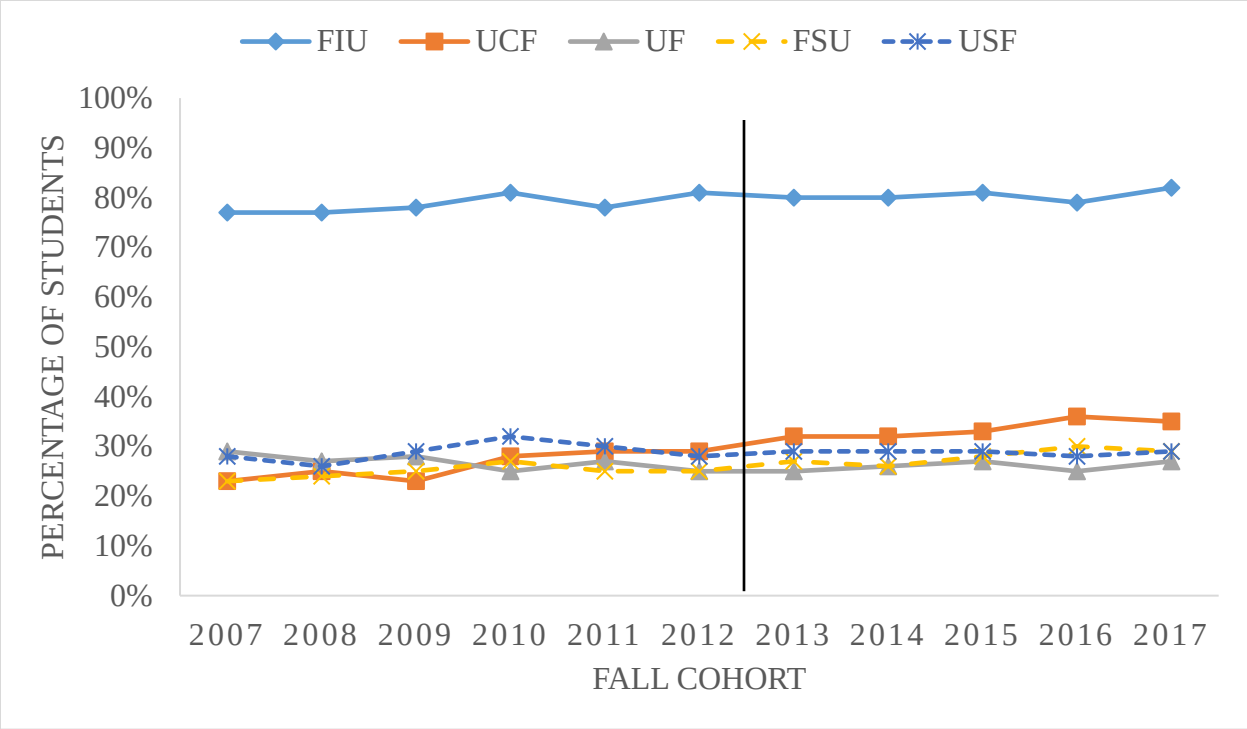

Figure 18. Percentage of FLSUS FTIC students who are from a minority racial/ethnic group (Black, Hispanic, and Native American) before and after PBF implementation at Highest Research Carnegie Classification institutions.

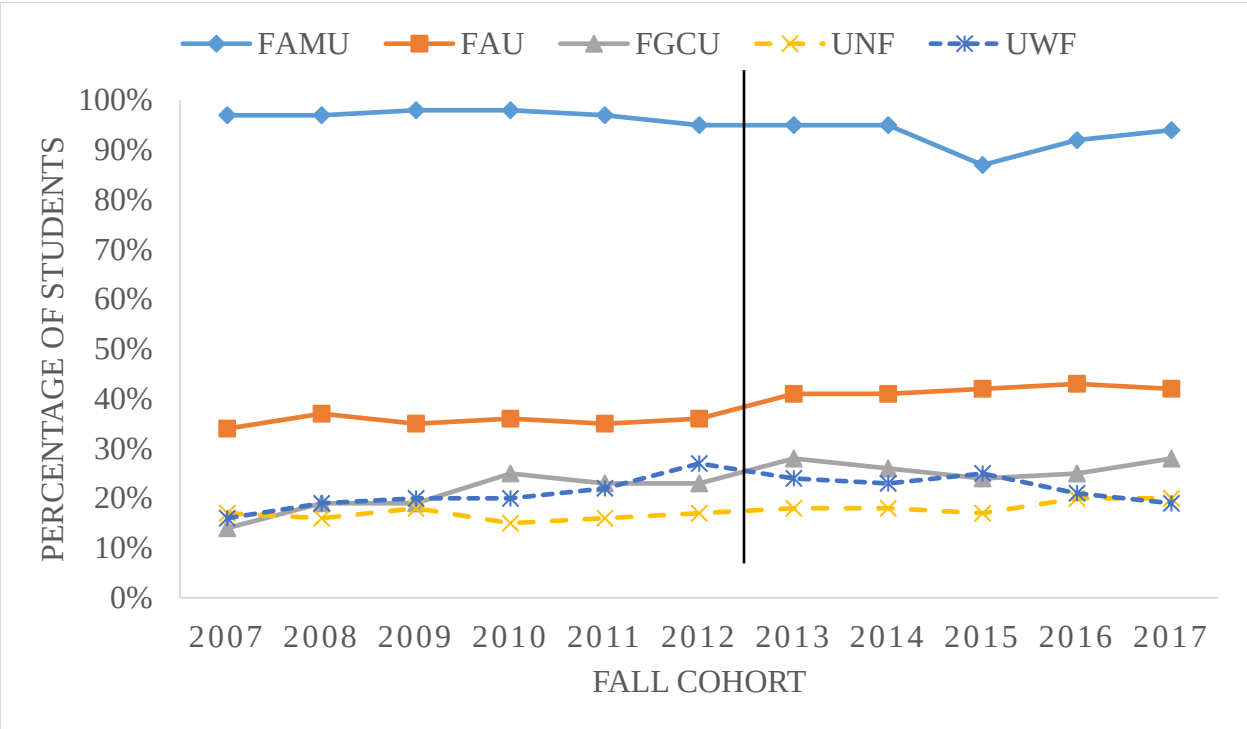

Figure 19. Percentage of FLSUS FTIC students who are from a minority racial/ethnic group (Black, Hispanic, and Native American) before and after PBF implementation at High Research and lower Carnegie Classification institutions.

Table 20

Percentage of FTIC Students who are from Minority Races at FLSUS Institutions Prior to and After PBF Implementation

	Years Prior to PBF Implementation						*Years After PBF Implementation*				
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Florida Agricultural & Mechanical University	97%	97%	98%	98%	97%	95%	95%	95%	87%	92%	94%
Florida Atlantic University	34%	37%	35%	36%	35%	36%	41%	41%	42%	43%	42%
Florida Gulf Coast University	14%	19%	19%	25%	23%	23%	28%	26%	24%	25%	28%
Florida International University	77%	77%	78%	81%	78%	81%	80%	80%	81%	79%	82%
Florida State University	23%	24%	25%	27%	25%	25%	27%	26%	28%	30%	29%
University of Central Florida	23%	25%	23%	28%	29%	29%	32%	32%	33%	36%	35%
University of Florida	29%	27%	28%	25%	27%	25%	25%	26%	27%	25%	27%
University of North Florida	17%	16%	18%	15%	16%	17%	18%	18%	17%	20%	20%
University of South Florida	28%	26%	29%	32%	30%	28%	29%	29%	29%	28%	29%
University of West Florida	16%	19%	20%	20%	22%	27%	24%	23%	25%	21%	19%

Shaded cells indicate a decrease over the previous year.

Table 21

Descriptive Statistics of the Percentage FTIC Students Who Are from Minority Racial/Ethnic Groups (Black, Hispanic, or Native American) Prior to and After PBF Implementation by FLSUS Institution

	Years Prior to PBF Implementation				*Years After PBF Implementation*			
	M	SD	Min	Max	M	SD	Min	Max
Florida Agricultural & Mechanical University	97%	.012	95%	98%	93%	.032	87%	95%
Florida Atlantic University	36%	.011	34%	37%	42%	.008	41%	43%
Florida Gulf Coast University	20%	.039	14%	25%	26%	.018	24%	28%
Florida International University	79%	.019	77%	81%	80%	.010	79%	82%
Florida State University	25%	.013	23%	27%	28%	.018	26%	30%
University of Central Florida	26%	.029	23%	29%	34%	.019	32%	34%
University of Florida	27%	.015	25%	29%	26%	.009	25%	27%
University of North Florida	17%	.012	15%	18%	19%	.014	17%	20%
University of South Florida	29%	.019	26%	32%	29%	.005	28%	29%
University of West Florida	21%	.037	16%	27%	23%	.026	19%	25%

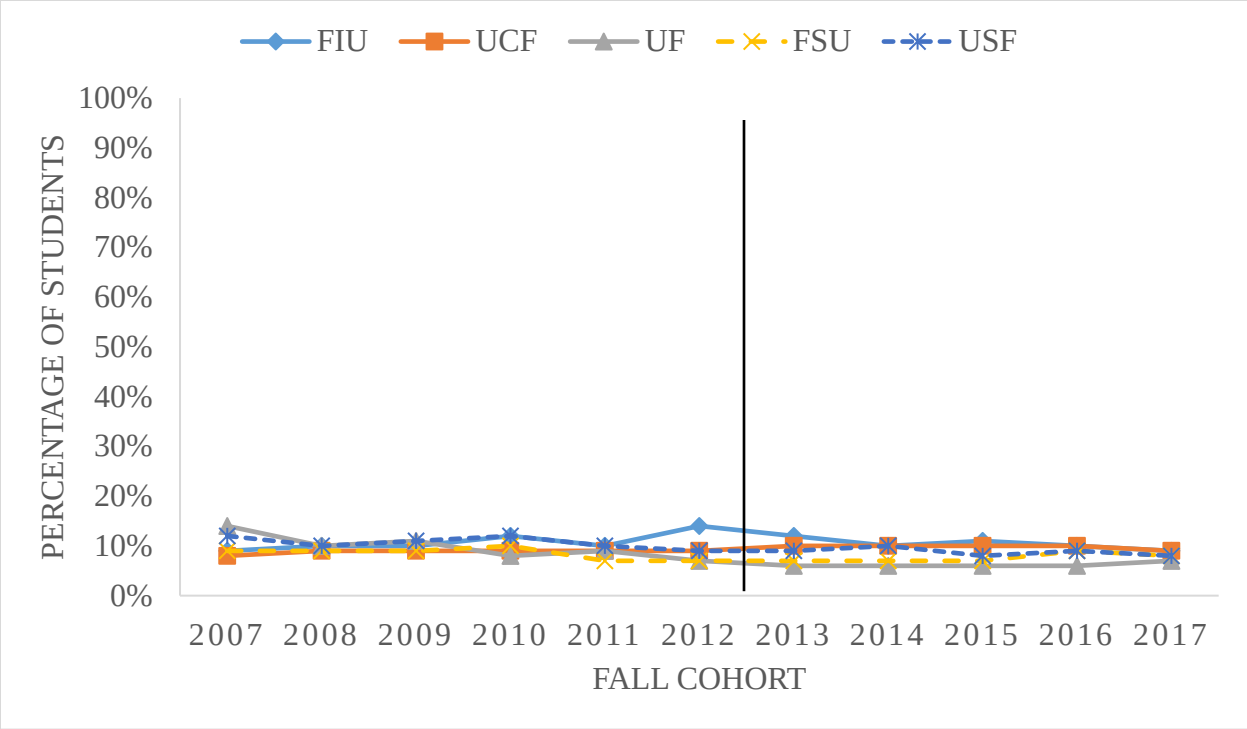

Figure 20. Percentage of FTIC students who are Black before and after PBF implementation at Highest Research Carnegie Classification institutions.

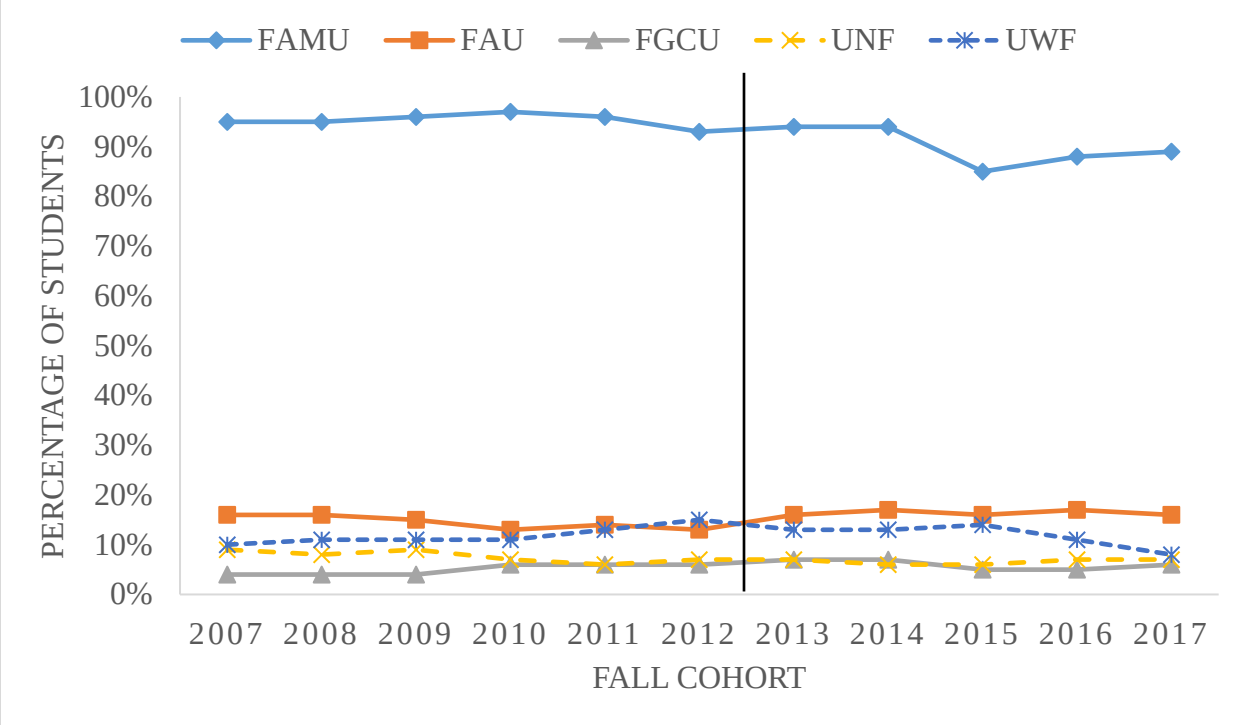

Figure 21. Percentage of FTIC students who are Black before and after PBF implementation at High Research and lower Carnegie Classification institutions.

Table 22

Percentage of FTIC Students who are Black at FLSUS Institutions Prior to and After PBF Implementation

	Years Prior to PBF Implementation						*Years After PBF Implementation*				
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Florida Agricultural & Mechanical University	95%	95%	96%	97%	96%	93%	94%	94%	85%	88%	89%
Florida Atlantic University	16%	16%	15%	13%	14%	13%	16%	17%	16%	17%	16%
Florida Gulf Coast University	4%	4%	4%	6%	6%	6%	7%	7%	5%	5%	6%
Florida International University	9%	10%	10%	12%	10%	14%	12%	10%	11%	10%	9%
Florida State University	9%	9%	9%	10%	7%	7%	7%	7%	7%	9%	8%
University of Central Florida	8%	9%	9%	9%	9%	9%	10%	10%	10%	10%	9%
University of Florida	14%	10%	11%	8%	9%	7%	6%	6%	6%	6%	7%
University of North Florida	9%	8%	9%	7%	6%	7%	7%	6%	6%	7%	7%
University of South Florida	12%	10%	11%	12%	10%	9%	9%	10%	8%	9%	8%
University of West Florida	10%	11%	11%	11%	13%	15%	13%	13%	14%	11%	8%

Shaded cells indicate a decrease over the previous year.

Table 23

Descriptive Statistics of the Percentage FTIC Students Who Are Black Prior to and After PBF Implementation by FLSUS Institution

	Years Prior to PBF Implementation				*Years After PBF Implementation*			
	M	SD	Min	Max	M	SD	Min	Max
Florida Agricultural & Mechanical University	95%	.015	93%	97%	90%	.38	85%	94%
Florida Atlantic University	14%	.012	13%	16%	16%	.004	16%	17%
Florida Gulf Coast University	5%	.011	4%	6%	6%	.010	5%	7%
Florida International University	11%	.016	9%	14%	10%	.009	9%	12%
Florida State University	9%	.012	7%	10%	7%	.007	7%	9%
University of Central Florida	9%	.004	8%	9%	10%	.005	9%	10%
University of Florida	10%	.024	7%	14%	6%	.004	6%	7%
University of North Florida	7%	.012	6%	9%	7%	.005	6%	7%
University of South Florida	11%	.011	9%	12%	9%	.005	8%	10%
University of West Florida	12%	.019	10%	15%	12%	.026	8%	14%

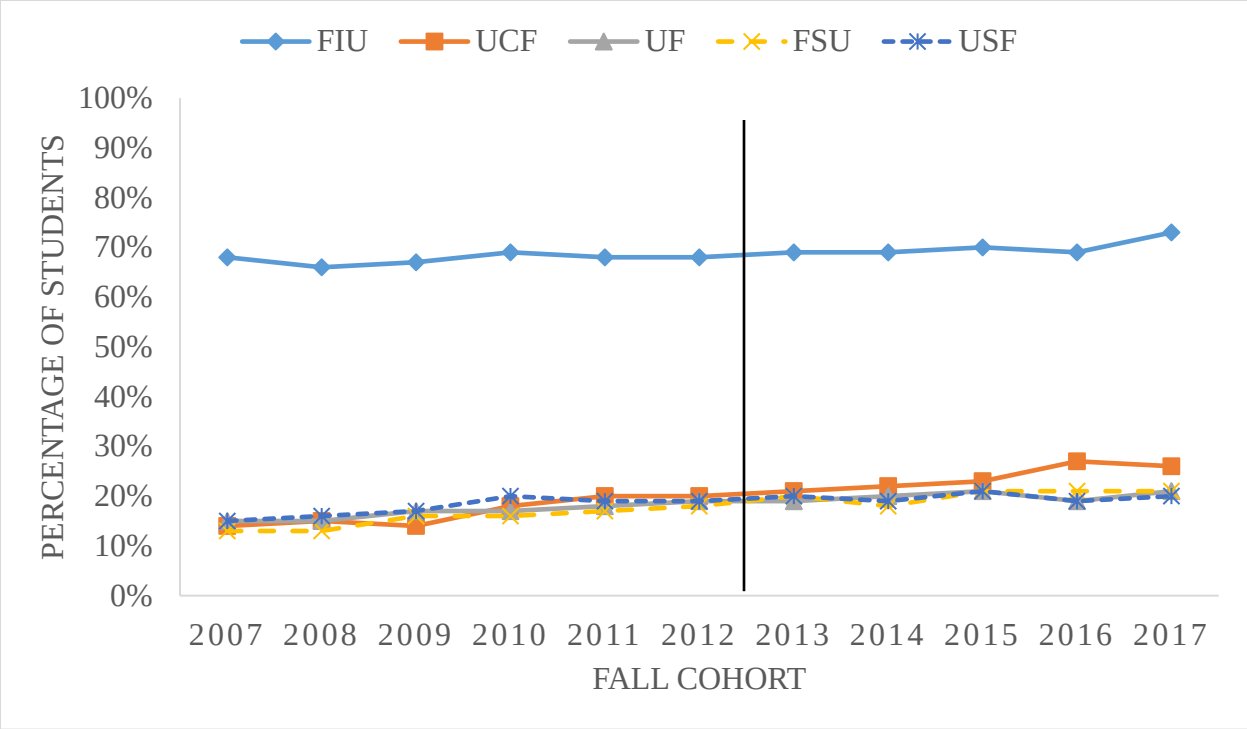

Figure 22. Percentage of FTIC students who are Hispanic before and after PBF implementation at Highest Research Carnegie Classification institutions.

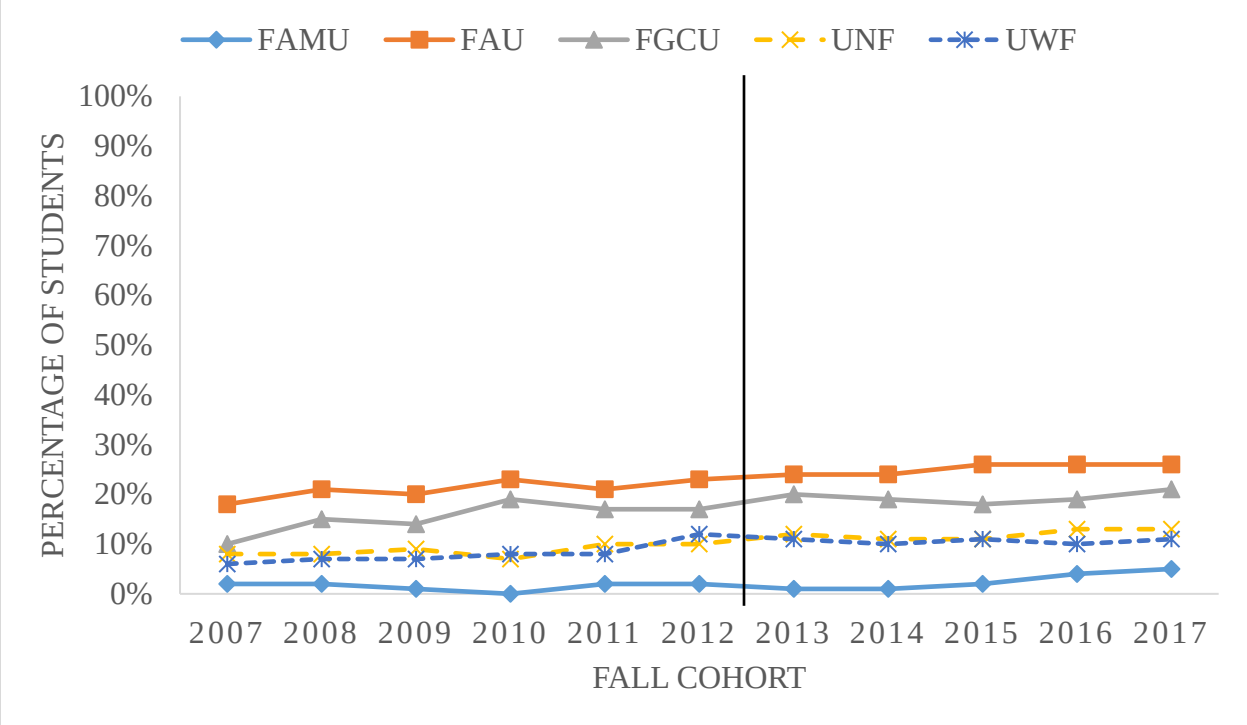

Figure 23. Percentage of FTIC students who are Hispanic before and after PBF implementation at High Research and lower Carnegie Classification institutions

Table 24

Percentage of FTIC Students who are Hispanic at FLSUS Institutions Prior to and After PBF Implementation

	Years Prior to PBF Implementation					*Years After PBF Implementation*					
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Florida Agricultural & Mechanical University	2%	2%	1%	0%	2%	2%	1%	1%	2%	4%	5%
Florida Atlantic University	18%	21%	20%	23%	21%	23%	24%	24%	26%	26%	26%
Florida Gulf Coast University	10%	15%	14%	19%	17%	17%	20%	19%	18%	19%	21%
Florida International University	68%	66%	67%	69%	68%	68%	69%	69%	70%	69%	73%
Florida State University	13%	13%	16%	16%	17%	18%	20%	18%	21%	21%	21%
University of Central Florida	14%	15%	14%	18%	20%	20%	21%	22%	23%	27%	26%
University of Florida	15%	15%	17%	17%	18%	19%	19%	20%	21%	19%	21%
University of North Florida	8%	8%	9%	7%	10%	10%	12%	11%	11%	13%	13%
University of South Florida	15%	16%	17%	20%	19%	19%	20%	19%	21%	19%	20%
University of West Florida	6%	7%	7%	8%	8%	12%	11%	10%	11%	10%	11%

Shaded cells indicate a decrease over the previous year.

Table 25

Descriptive Statistics of the Percentage FTIC Students Who Are Hispanic Prior to and After PBF Implementation by FLSUS Institution

	Years Prior to PBF Implementation				*Years After PBF Implementation*			
	M	SD	Min	Max	M	SD	Min	Max
Florida Agricultural & Mechanical University	1%	.012	0%	2%	3%	.016	1%	5%
Florida Atlantic University	21%	.018	18%	23%	25%	.009	24%	25%
Florida Gulf Coast University	15%	.032	10%	19%	20%	.012	18%	21%
Florida International University	68%	.008	66%	69%	70%	.015	69%	73%
Florida State University	16%	.019	13%	18%	20%	.011	18%	21%
University of Central Florida	17%	.028	14%	20%	24%	.024	21%	27%
University of Florida	17%	.014	15%	19%	20%	.007	19%	21%
University of North Florida	9%	.012	7%	10%	12%	.010	11%	13%
University of South Florida	18%	.020	15%	20%	20%	.007	19%	21%
University of West Florida	8%	.020	6%	12%	10%	.004	10%	11%

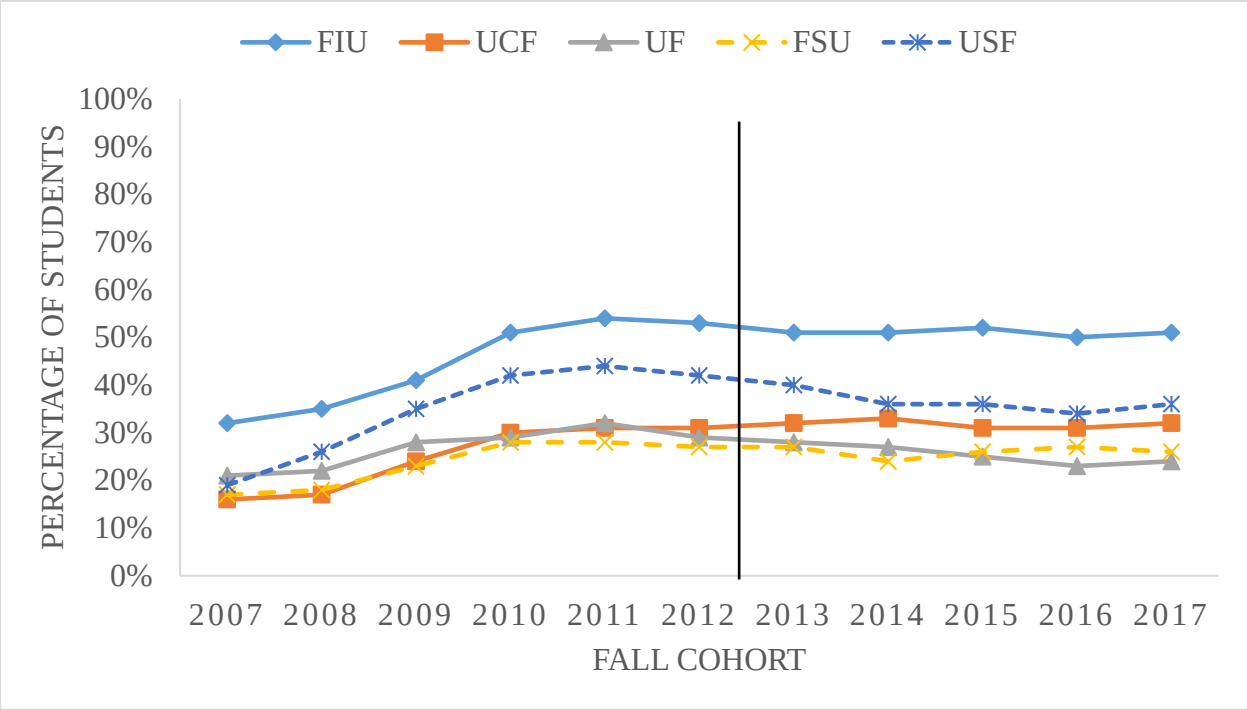

Figure 24. Percentage of FTIC students who were awarded a Pell Grant before and after PBF implementation at Highest Research Carnegie Classification institutions.

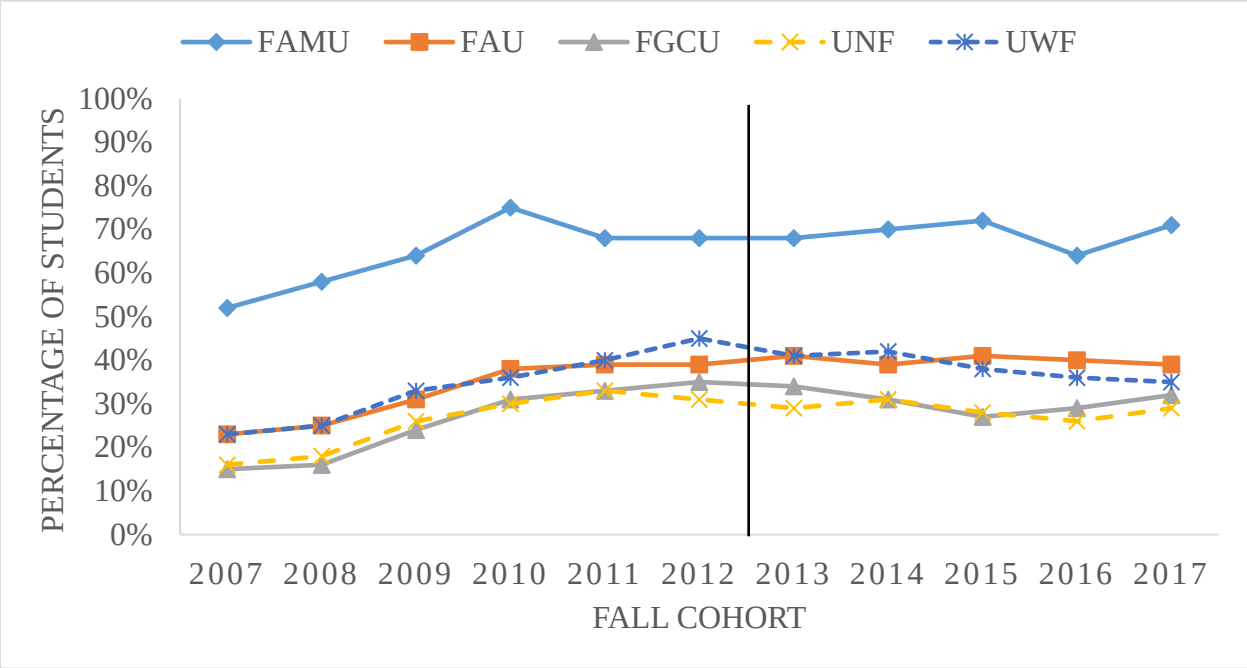

Figure 25. Percentage of FTIC students who were awarded a Pell Grant before and after PBF implementation at High Research and lower Carnegie Classification institutions.

Table 26

Percentage of FTIC Students who were awarded a Pell Grant at FLSUS Institutions Prior to and After PBF Implementation

	Years Prior to PBF Implementation						*Years After PBF Implementation*				
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Florida Agricultural & Mechanical University	52%	58%	64%	75%	68%	68%	68%	70%	72%	64%	71%
Florida Atlantic University	23%	25%	31%	38%	39%	39%	41%	39%	41%	40%	39%
Florida Gulf Coast University	15%	16%	24%	31%	33%	35%	34%	31%	27%	29%	32%
Florida International University	32%	35%	41%	51%	54%	53%	51%	51%	52%	50%	51%
Florida State University	17%	18%	23%	28%	28%	27%	27%	24%	26%	27%	26%
University of Central Florida	16%	17%	24%	30%	31%	31%	32%	33%	31%	31%	32%
University of Florida	21%	22%	28%	29%	32%	29%	28%	27%	25%	23%	24%
University of North Florida	16%	18%	26%	30%	33%	31%	29%	31%	28%	26%	29%
University of South Florida	19%	26%	35%	42%	44%	42%	40%	36%	36%	34%	36%
University of West Florida	23%	25%	33%	36%	40%	45%	41%	42%	38%	36%	35%

Shaded cells indicate a decrease over the previous year.

Table 27

Descriptive Statistics of Entering FTIC who were awarded a Pell Grant Prior to and After PBF Implementation by FLSUS Institution

	Years Prior to PBF Implementation				*Years After PBF Implementation*			
	M	SD	Min	Max	M	SD	Min	Max
Florida Agricultural & Mechanical University	64%	.082	52%	75%	69%	.032	64%	72%
Florida Atlantic University	33%	.073	23%	39%	40%	.010	39%	41%
Florida Gulf Coast University	26%	.087	15%	35%	31%	.027	27%	34%
Florida International University	44%	.096	32%	54%	51%	.007	50%	52%
Florida State University	24%	.050	17%	28%	26%	.012	24%	27%
University of Central Florida	25%	.070	16%	31%	32%	.008	31%	33%
University of Florida	27%	.044	21%	32%	25%	.021	23%	28%
University of North Florida	26%	.071	16%	33%	29%	.018	26%	31%
University of South Florida	35%	.101	19%	44%	36%	.022	34%	40%
University of West Florida	34%	.085	23%	45%	38%	.031	35%	42%

Research Question II

To answer Research Question II, correlations between 1st-year retention rates and the access metrics and students' demographic characteristics were run. First a full review of the correlations, regardless of PBF implementation time period will follow. Then a review of the correlations as observed prior to PBF implementation and after PBF implementation. A discussion of significance in the differences of these correlations is also discussed.

Table 28 displays the results from the Pearson-product Moment correlation between 1st-year retention rates and the access metrics. All metrics were found to have a significant relationship with 1st- year retention. All coefficients were positive except for the acceptance rate coefficient. Therefore, the higher the GPA and SAT scores the higher the 1st-year retention rate but the higher the acceptance rate, the lower the 1st- year retention rate.

Table 28

Correlations Between 1st- year Retention Rates and the Access Metrics

1st-year Retention Rate and	Acceptance Rate	Average High School Weighted GPA	25th Percentile Critical Reading SAT Score	75th Percentile Critical Reading SAT Score	25th Percentile Math SAT Score	75th Percentile Math SAT Score
Pearson Correlation	-.440**	.722**	.772**	.773**	.802**	.812**
Sig (2-tailed)	.000	.000	.000	.000	.000	.000
N	107	100	107	107	107	107

** p< .01 level (2-tailed)
*p< .05 level (2-tailed)

Table 29 displays the results from the Pearson-product Moment correlation between 1st-year retention rates and the student demographic characteristics. Only the percentage of Pell Grant recipients was found to have a significant relationship to 1st- year retention. The negative

relationship between the two indicates the higher rate of Pell Grants recipients the lower the rate of 1st- year retention. Although not significant, the percentage of minority students and the percentage of Black students resulted in negative coefficients. The percentage of Hispanic students positively correlated, but again, not significantly.

Table 29

Correlations Between 1st- year Retention Rates and the Student Demographics

1st-year Retention Rate and	Percentage Minority	Percentage Black	Percentage Hispanic	Percentage Pell Grant
Pearson Correlation	-.056	-.160	.155	-.218*
Sig (2-tailed)	.563	.095	.107	.022
N	110	110	110	110

** $p < .01$ level (2-tailed)
* $p < .05$ level (2-tailed)

To test if the correlational relationship remained the same before and after PBF implementation and to identify if there was a significant change in the coefficients between the two time periods separate coefficients were run for the relationship of 1st-year retention rates and the access metrics and student demographic characteristics. In Table 30 and 31, r_1 represents the coefficients prior to PBF implementation and r_2 represents the coefficients after PBF implementation

Table 30 shows the relationship between 1st-year retention rates and the access metrics remained significant and positive prior to and after PBF implementation for all the variables except the acceptance rate. Prior to PBF implementation the relationship between 1st-year retention and the acceptance rate was strongly negative and significant and became a weaker, non-significant relationship after PBF implementation. The differences between the two coefficients was also found to be statistically significant.

Table 30

Testing of Significant Difference between Correlations Between 1st- year Retention Rates and the Access Metrics Prior to and After PBF Implementation

1st-year Retention Rate and	Acceptance Rate	Average High School Weighted GPA	25th Percentile Critical Reading SAT Score	75th Percentile Critical Reading SAT Score	25th Percentile Math SAT Score	75th Percentile Math SAT Score
r_1	-.573**	.782**	.812**	.788**	.829**	.835**
r_2	-.245	.651**	.728**	.750**	.775**	.799**
Z_{obs}	**-2.030**	1.374	.993	.491	.777	.526

** p< .01 level (2-tailed)
*p< .05 level (2-tailed)
r_1 = Years prior to PBF implementation; r_2= Years after PBF implementation
Z_{ob} is less than or equal to -1.96 or greater than 1.96; coefficients are statistically significantly different.

Table 31 shows the relationship between 1st-year retention rates and the student demographic characteristics. The relationships prior to and after PBF implementation were all weak and negative except the percentage of Hispanic students. This relationship remained positive after PBF implementation and became stronger but neither were significant, r = .066 compared to r=.239. There was also no statistically significant difference between the coefficients when comparing the results prior to and after PBF implementation.

Table 31

Testing of Significant Difference between Correlations Between 1st-year Retention Rates and the Student Demographics Prior to and After PBF Implementation

1st-year Retention Rate and	Percentage Minority	Percentage Black	Percentage Hispanic	Percentage Pell Grant
r_1	-.096	-.141	.066	-.205
r_2	-.019	-.183	.239	-.295*
Z_{obs}	-.381	.233	-1.878	-.487

** p< .01 level (2-tailed)
*p< .05 level (2-tailed)
r_1 = Years prior to PBF implementation; r_2= Years after PBF implementation
Z_{ob} is less than or equal to -1.96 or greater than 1.96; coefficients are statistically significantly different.

Research Question III

To answer research question III, Pearson-product Moment correlations were again produced. This time the coefficients were generated separately by institutional characteristic to allow for comparison between minority and non-minority serving institutions and Highest Research and High Research and lower Carnegie Classification institutions.

Table 32 and 33, r_1 represents the Highest Research Carnegie Classification institutions and r_2 represents those with classifications High Research and lower. Table 32 shows the correlation coefficients of the relationship between 1st-year retention rates and the access metrics split by Carnegie Classification. A statistically significant difference between the two Carnegie Classifications is evident in each of the variables. For acceptance rate, the coefficient for Highest Research institutions was a weak positive, non-significant relationship, $r = .161$, $p > .05$, compared to the moderately negative, significant relationship for High Research and lower institutions $r=-.305$, $p<.05$. Average weighted GPA and the SAT scores were found to have strong positive, significant relationships at the Highest Research institutions and weak, positive, non-significant relationships at the High Research and lower institutions.

Table 33 shows the correlation coefficients for the relationship between 1st-year retention rates and the student demographic characteristic split by Carnegie Classification, the Highest Research Carnegie Classification institutions (r_1) and those with classifications High Research and lower (r_2). The difference between each of the coefficients was found to be statistically significant. Highest Research institutions were found to have moderate to strong negative and significant relationships between the variables. The High Research and lower institutions had mostly positive, weak to moderate and significant relationships except for the percentage of Hispanic students which was negative. Although the relationship between Hispanics and

retention rate was not as strongly negative as it was for Highest Research institutions, r = -.601, $p<.01$, it was still found to be negative, r=-.211, $p>.05$.

Table 32

Testing of Significant Difference between Correlations Between 1st- year Retention Rates and the Access Metrics between Highest Research Carnegie Classified Institutions and High Research and Lower Carnegie Classified Institutions

1st-year Retention Rate and	Acceptance Rate	Average High School Weighted GPA	25th Percentile Critical Reading SAT Score	75th Percentile Critical Reading SAT Score	25th Percentile Math SAT Score	75th Percentile Math SAT Score
r_1	.161	.864**	.826**	.886**	.853**	.850**
r_2	-.305*	.099	.254	.150	.200	.118
Z_{obs}	**3.295**	**3.878**	**3.109**	**3.812**	**3.476**	**3.862**

** $p<.01$ level (2-tailed)
* $p<.05$ level (2-tailed)
r_1 = Carnegie Highest Research; r_2= Carnegie High Research or Lower
Z_{ob} is less than or equal to -1.96 or greater than 1.96; coefficients are statistically significantly different.

Table 33

Testing of Significant Difference between Correlations Between 1st- year Retention Rates and the Student Demographics between Highest Research Carnegie Classified Institutions and High Research and Lower Carnegie Classified Institutions

1st-year Retention Rate and	Percentage Minority	Percentage Black	Percentage Hispanic	Percentage Pell Grant
r_1	-.625**	-.516**	-.601**	-.484
r_2	.396**	.394**	-.211	.280*
Z_{obs}	**-5.869**	**-5.038**	**-2.448**	**-4.171**

** $p<.01$ level (2-tailed)
* $p<.05$ level (2-tailed)
r_1 = Carnegie Highest Research; r_2= Carnegie High Research or Lower
Z_{ob} is less than or equal to -1.96 or greater than 1.96; coefficients are statistically significantly different.

Table 34 displays separately the correlation coefficients between 1st-year retention and the access metrics for minority serving institutions represented by r_1 and non-minority serving institutions represented by r_2. For both minority serving and non-minority serving institutions average weighted high school GPA and SAT scores correlated positively with 1st-year retention rates. The relationships were significant for the non-minority serving institutions. A statistically significant difference was found between the correlations of minority serving and non-minority serving institutions. Acceptance rate was found to have a negative relationship to 1st-year retention at both types of institutions. The relationship was, however, statistically significantly different from each other with the non-minority serving institutions having a stronger negative and significant correlation coefficient, r -.587, $p<.01$ compared to r=-.144, $p>.05$.

Table 34

Testing of Significant Difference between Correlations Between 1st- year Retention Rates and the Access Metrics Between Minority Serving Institutions and Non-Minority Serving Institutions

1st-year Retention Rate and	Acceptance Rate	Average High School Weighted GPA	25th Percentile Critical Reading SAT Score	75th Percentile Critical Reading SAT Score	25th Percentile Math SAT Score	75th Percentile Math SAT Score
r_1	-.144	.314	.350	.404*	.231	.221
r_2	-.587**	.841**	.876**	.872**	.927**	.931**
Z_{obs}	**2.357**	**-3.926**	**-4.449**	**-3.365**	**-5.389**	**-5.569**

** $p<.01$ level (2-tailed)
* $p<.05$ level (2-tailed)
r_1 = Minority Serving; r_2= Non-Minority Serving
Z_{ob} is less than or equal to -1.96 or greater than 1.96; coefficients are statistically significantly different.

Table 35 displays separately the correlation coefficients between 1st-year retention and the student demographic characteristics for minority serving institutions (r_1) and non-minority serving institutions (r_2). The only significant difference between the two types of institutions was

associated with the Percentage Pell Grant recipients. Minority serving institutions were found to have a positive, non-significant relationship with 1st- year retention rates, r = .343, $p>.05$ and non-minority serving had a negative, significant relationship, r = -.235, $p<.05$. The percentage minority, percentage Black, and percentage Hispanic relationships behaved similarly for the both types of institutions. Both minority enrollment and Hispanic enrollment were significantly positive and the percentage of Black enrollment was negative but non-significant.

Table 35

Testing of Significant Difference between Correlations Between 1st- year Retention Rates and the Student Demographics Between Minority Serving Institutions and Non-Minority Serving Institutions

1st-year Retention Rate and	Percentage Minority	Percentage Black	Percentage Hispanic	Percentage Pell Grant
r_1	.533**	-.034	.508**	.343
r_2	.556**	-.080	.616**	-.235*
Z_{obs}	-.134	-.116	-.217	**2.767**

** $p<.01$ level (2-tailed)
* $p<.05$ level (2-tailed)
r_1 = Minority Serving; r_2= Non-Minority Serving
Z_{ob} is less than or equal to -1.96 or greater than 1.96; coefficients are statistically significantly different.

Research Question IV

To answer Research Question IV, a piecewise growth model for both 1st-year retention rates and 6-year graduation rates were generated. Time was segmented prior to and after PBF implementation. To test the variance at the intra- and inter-individual levels and to ensure the need for a two-level model an unconditional mean model and an unconditional linear growth curve model were run. For all models, the Maximum Likelihood estimation (ML) and scaled identity covariance structure for the random effects was employed. The interpretation of the output from the models is subject to an inflated Type II error rate because of the small number of

institutions included. Also, because this is an exploratory study the alpha levels have been set to the higher .05. This higher alpha may result in possible Type I errors in interpreting the results.

The first model fitted for 6-year graduation rates is the unconditional mean model. Results are for the model are displayed in Table 36. Results from the test produced a grand mean 6-year graduation rate of 57%. Using the results from the variance components table the variability in 6-year graduation rates at each level was calculated. Following the formula for the Interclass Correlation Coefficient (ICC), .020/(.020 + .002) = .919 or 92%. Suggesting that 92% of total variation in the outcome variable, 6-year graduation rate, is due to differences between the individuals or in the case the institutions. The Level 2 variance, .020 (Wald Z = 2.213, $p<.05$) suggests adequate difference in the initial status of the slopes across the institutions; however, because of the small sample size, the interpretation of the significance tests should be conducted cautiously.

Table 36

6-year Graduation Rate Results from Unconditional Mean Model

Estimate of the Fixed Effects							
						95% Confidence Interval	
Parameter	Estimate	SE	Df	t	Sig.	Lower Bound	Upper Bound
Initial Status	.566	.047	10	12.697	.000	.466	.666

Estimate of the Covariance Parameters						
					95% Confidence Interval	
Parameter	Estimate	SE	Wald Z	Sig.	Lower Bound	Upper Bound
Residual	.002	.0003	7.416	.000	.001	.003
Intercept	.020	.009	2.213	.027	.008	.048

The unconditional linear growth curve model was fitted to examine the individual institution rate of change over time. As shown in Table 37, there was not a significant linear increase in 6-year graduation rates over time (β = .011, SE = .031, p=.733). The random error associated with the intercept and linear effect were significant (p<.01), indicating the variability in the parameters could be explained by between-individual predictors. Additionally, there was a decline in the residual variance from the unconditional mean model from .002 to .0005 but this represents only .1% of the variation in 6-year graduation rate that is associated with linear rate of change (Shek and Ma, 2011).

Table 37

6-year Graduation Rate Results from Unconditional Linear Growth Curve Model

Estimate of the Fixed Effects							
						95% Confidence Interval	
Parameter	Estimate	SE	df	t	Sig.	Lower Bound	Upper Bound
Initial Status	.497	.031	19.997	15.892	.000	.432	.562
Time	.011	.031	19.248	.346	.733	-.054	.075
Estimate of the Covariance Parameters							
						95% Confidence Interval	
Parameter	Estimate	SE		Wald Z	Sig.	Lower Bound	Upper Bound
Residual	.0005	.000		7.057	.000	.0003	.0007
Time	.010	.003		3.101	.002	.005	.018

To test if the growth trajectories of 6-year graduation rates are different before and after PBF implementation a piecewise growth model was fitted. Results from the growth model can be used to compare the growth rate for the period prior to PBF implementation to the period after the implementation (Heck et al 2014). The fixed effects presented in Table 38 show a significant increase in the slope before the implementation of PBF (β = .010, SE = .002, p<.001) and after

the implementation (β = .012, SE = .002, p<.001). Also, there is a significant variance in the in initial status intercepts across the institutions (Wald Z = 2.227, p <.05).

Table 38

6-year Graduation Rate Results from the Piecewise Growth Model – Before and After PBF Slope Trajectory

Estimate of the Fixed Effects							
						95% Confidence Interval	
Parameter	Estimate	SE	Df	t	Sig.	Lower Bound	Upper Bound
Initial Status	.511	.045	10.358	11.339	.000	.410	.610
Pre-Implementation Slope	.010	.002	110	5.721	.000	.006	.013
Post-Implementation Slope	.012	.002	110	5.985	.000	.008	.016

Estimate of the Covariance Parameters						
					95% Confidence Interval	
Parameter	Estimate	SE	Wald Z	Sig	Lower Bound	Upper Bound
Repeated Measures	.001	.000	7.416	.000	.000	.001
Intercept	.020	.009	2.227	.026	.008	.048

As displayed in Table 39, both the pre- and post-PBF growth trajectories of most of the FLSUS institutions were statistically increasing. FGCU showed a significant increase prior to PBF implementation (β = .012, SE = .012, p<.05) but did not after PBF implementation (β = .001, SE = .005, p>.05). Conversely, FAMU (β = -.002, SE = .003, p>.05, β = .019, SE = .004, p<.01) and FIU (β = .006, SE = .004, p>.05, β = .018, SE = .005, p<.01) showed a nonsignificant growth trajectory prior to PBF implementation and a significant positive growth trajectory after PBF implementation. UWF did not show a significant growth trajectory before (β = .001, SE = .004, p >.05) or after PBF implementation (β = -.003, SE = .005, p >.05).

Table 39

6-year Graduation Rate Results from the Piecewise Growth Model – Before and After PBF Slope Trajectory by FLSUS Institution

	FAMU	FAU	FGCU	FIU	FSU	UCF	UF	UNF	USF	UWF
Fixed Effects										
Initial Status	.403**	.380***	.395***	.464***	.688***	.602***	.808***	.455***	.451***	.460***
	(.013)	(.008)	(.017)	(.017)	(.004)	(.008)	(.004)	(.009)	(.015)	(.017)
Pre-Implementation Slope	-.002	.009**	.012*	.006	.014***	.012***	.010***	.009**	.026***	.001
	(.003)	(.002)	(.012)	(.004)	(.001)	(.002)	(.001)	(.002)	(.004)	(.004)
Post-Implementation Slope	.019**	.020***	.001	.018**	.010***	.010**	.005**	.016***	.026***	-.003
	(.004)	(.003)	(.005)	(.005)	(.001)	(.002)	(.001)	(.003)	(.005)	(.005)
Random Effects										
Residual	.004*	.002*	.001*	.001*	.000*	.000*	4.12*	.000*	.001*	.001*
	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)

*** $p<.001$, ** $p<.01$, * $p<.05$

Lastly, to examine the model for a change in slope after PBF implementation the growth model was fitted again with the Time variable and the post-implementation slope. The fixed effect for the post-implementation slope presented in Table 40 shows there was not a significant change in slope after PBF implementation (β = .003, SE = .003, p =.422).

Table 40

6-year Graduation Rate Results from the Piecewise Growth Model – Change in Slope after PBF

Estimate of the Fixed Effects							
						95% Confidence Interval	
Parameter	Estimate	SE	df	t	Sig.	Lower Bound	Upper Bound
Initial Status	.501	.045	10.578	11.068	.000	.400	.601
Time	.010	.002	110	5.721	.000	.006	.013
Post-Implementation Slope	.003	.003	110	.806	.422	-.004	.009

Estimate of the Covariance Parameters						
					95% Confidence Interval	
Parameter	Estimate	SE	Wald Z	Sig	Lower Bound	Upper Bound
Repeated Measures	.001	.000	7.416	.000	.000	.001
Intercept	.020	.009	2.227	.026	.008	.048

Table 41 displays the growth model for change in slope of 6-year graduation rates after PBF implementation by FLSUS institution. The results show that only FAMU (β = .021, SE = .007, p<.01) and FAU (β = .012, SE = .004, p<.05) showed a change in slope after PBF implementation.

Table 41

6-year Graduation Rate Results from the Piecewise Growth Model – Change in Slope after PBF by FLSUS Institution

	FAMU	FAU	FGCU	FIU	FSU	UCF	UF	UNF	USF	UWF
Fixed Effects										
Intercept	.405***	.371***	.383***	.457***	.674***	.590***	.798***	.446***	.425***	.460***
	(.016)	(.010)	(.020)	(.021)	(.005)	(.009)	(.005)	(.011)	(.019)	(.020)
Time	-.002	.008**	.012*	.006	.014***	.012***	.009***	.009**	.026***	.001
	(.003)	(.002)	(.004)	(.004)	(.001)	(.002)	(.001)	(.002)	(.004)	(.004)
Post-Implementation Slope	.021**	.012*	-.011	.012	-.004	-.002	-.004	.007	-.001	-.003
	(.007)	(.004)	(.008)	(.009)	(.002)	(.004)	(.002)	(.005)	(.008)	(.008)
Random Effects										
Residual	.000*	.000*	.001*	.001*	.000*	.000*	.000*	.000*	.001*	.001*
	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)

*** $p<.001$, ** $p<.01$, * $p<.05$

When exploring 1st-year retention rate growth trajectories, the first model fitted was the unconditional mean model. Results from the test, shown in Table 42, produced a grand mean 1st-year retention rate of 84%. Using the results from the variance components table the variability in 1st-year retention rates at each level was calculated following the formula for the Interclass Correlation Coefficient (ICC), .004/ (.004 + .0004) = .90.9 or 91%. Suggesting that 91% of total variation in the outcome variable, 1st-year retention rate, is due to differences between the individuals or in this case the institutions. The Level 2 variance, .004 (Wald Z = 2.217, p <.05) suggests adequate difference in the intercepts across the institutions; however, because of the small sample size, the interpretation of the significance tests should be conducted cautiously.

Table 42

1st-year Retention Rate Results from the Unconditional Mean Model

Estimate of the Fixed Effects							
Parameter	Estimate	SE	Df	t	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Initial Status	.841	.022	10	39.921	.000	.794	.888

Estimate of the Covariance Parameters						
					95% Confidence Interval	
Parameter	Estimate	SE	Wald Z	Sig.	Lower Bound	Upper Bound
Residual	.0004	.000	7.071	.000	.0003	.0006
Intercept	.004	.002	2.217	.027	.001	.011

Again, although the interpretation of the output from the unconditional mean model is subject to an inflated Type I error rate, the unconditional linear growth model was fitted to examine the individual institution rate of change over time. As shown in Table 43, there was not a significant linear increase in 6-year graduation rates over time (β = .003, SE = .015, p=.822). The random error associated with the intercept and linear effect were significant (p<.01), indicating the variability in the parameters could be explained by between-individual predictors. Additionally, there was a decline in the residual variance from the unconditional mean model from .004 to .0003 but this represents only .4% of the variation in 1st-year retention rate that is associated with linear rate of change (Shek and Ma, 2011).

Table 43

1st-year Retention Results from Unconditional Linear Growth Curve Model

Estimate of the Fixed Effects							
						95% Confidence Interval	
Parameter	Estimate	SE	Df	t	Sig.	Lower Bound	Upper Bound
Initial Status	.821	.015	19.975	53.814	.000	.789	.853
Time	.003	.015	18.131	.228	.822	-.029	.036

Estimate of the Covariance Parameters						
					95% Confidence Interval	
Parameter	Estimate	SE	Wald Z	Sig.	Lower Bound	Upper Bound
Residual	.0003	.000	6.671	.000	.0001	.0004
Intercept	.002	.001	3.008	.003	.001	.004

To test if the growth trajectories of 1st-year retention rates are different before and after PBF implementation a piecewise growth model was fitted. Results from the growth model can be used to compare the growth rate for the period prior to PBF implementation to the period after the implementation (Heck et al, 2014). The fixed effects presented in Table 44 show there was not a significant increase in the slope before the implementation of PBF (β = .002, SE = .001, p =.158) but there was a significant increase after the implementation (β = .005, SE = .001, p <.001). Also, there is a significant variance in the in initial status intercepts across the institutions (Wald Z = 2.223, p <.05).

Table 44

1st-year Retention Rate Results from the Piecewise Growth Model

Estimate of the Fixed Effects							
						95% Confidence Interval	
Parameter	Estimate	SE	Df	t	Sig.	Lower Bound	Upper Bound
Initial Status	.829	.021	10.539	38.794	.000	.781	.878
Pre-Implementation Slope	.002	.001	100	1.423	.158	-.000	.004
Post-Implementation Slope	.005	.001	100	4.575	.000	.002	.007
Estimate of the Covariance Parameters							
						95% Confidence Interval	
Parameter	Estimate	SE		Wald Z	Sig	Lower Bound	Upper Bound
Repeated Measures	.0003	.000		7.071	.000	.000	.0004
Intercept	.004	.002		2.223	.026	.001	.011

Table 45 shows the results of the institution-level growth models fitted to examine change in the trajectories of 1st-year retention rates prior to and after PBF implementation. Unlike 6-year graduation rates, 1st-year retention slope increase in the two time pieces is shown for only a few institutions. FIU (β = .005, SE = .002, p<.05, β = .013, SE = .001, p<.001) and UCF (β = .002, SE = .001, p<.01, β = .005, SE = .001, p=.001) showed significant increase in both time pieces. FSU also had a significant slope increase in the time period before PBF implementation (β = -.004, SE = .001, p<.05) and UWF showed a significant increase after PBF implementation (β = 016, SE = .005, p<.05).

Table 45

1st- year Retention Rates Results from the Piecewise Growth Model – Before and After PBF Slope Trajectory by FLSUS Institution

	FAMU	FAU	FGCU	FIU	FSU	UCF	UF	UNF	USF	UWF
Fixed Effects										
Initial Status	.802***	.781***	.750***	.809***	.901***	.864***	.954***	.806***	.871***	.750***
	(.012)	(.012)	(.009)	(.006)	(.005)	(.002)	(.003)	(.010)	(.006)	(-.005)
Pre-Implementation Slope	.002	-.002	.005	.005*	.004*	.002**	.001	.004	.003	-.010
	(.004)	(.004)	(.003)	(.002)	(.001)	(.001)	(.001)	(.003)	(.002)	(.005)
Post-Implementation Slope	.003	.006	.004	.013***	.003	.005***	.002	-.004	.003	.016*
	(.004)	(.004)	(.003)	(.001)	(.002)	(.001)	(.001)	(.00)	(.002)	(.005)
Random Effects										
Residual	.000*	.000*	.000*	.000*	.000*	.000*	.000*	.000*	.000*	.000*
	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)

*** p<.001, **p<.01, *p<.05

Lastly, to examine the model for a change in slope after PBF implementation the growth model was fitted with Time variable and the post-implementation slope. The fixed effect for post-PBF implementation, presented in Table 46, shows there was not a significant change in slope after PBF implementation (β = .004, SE = .002, p =.080).

Table 46

1st- year Retention Rates Results from the Piecewise Growth Model – Change in Slope after PBF

Estimate of the Fixed Effects							
						95% Confidence Interval	
Parameter	Estimate	SE	df	t	Sig.	Lower Bound	Upper Bound
Initial Status	.827	.022	10.937	38.360	.000	.779	.874
Time	.002	.001	100	1.423	.158	-.000	.004
Post-Implementation Slope	.004	.002	100	1.767	.080	-.000	.008
Estimate of the Covariance Parameters							
						95% Confidence Interval	
Parameter	Estimate	SE	Wald Z		Sig	Lower Bound	Upper Bound
Repeated Measures	.000	.000	7.071		.000	.000	.000
Intercept	.004	.002	2.223		.026	.002	.011

Table 47 displays the growth model for change in slope of 1st-year retention rates after PBF implementation by FLSUS institution. The results show that only FIU (β = .008, SE = .003, p<.05) and UWF (β = .025, SE = .008, p<.05) showed a change in slope after PBF implementation.

Table 47

1st- year Retention Rates Results from the Piecewise Growth Model – Change in Slope after PBF by FLSUS Institution

	FAMU	FAU	FGCU	FIU	FSU	UCF	UF	UNF	USF	UWF
Fixed Effects										
Initial Status	.800***	.784***	.742***	.803***	.900***	.861***	.953***	.802***	.868***	.758***
	(.015)	(.016)	(.011)	(.005)	(.006)	(.003)	(.004)	(.012)	(.008)	(.019)
Time	.002	-.002	.005	.005*	.004*	.002**	.001	.004	.003	-.009
	(.004)	(.004)	(.003)	(.002)	(.001)	(.007)	(.001)	(.003)	.002)	(.005)
Post-Implementation Slope	.001	.009	-.001	.008*	-.001	.003	.001	-.008	-.000	.025*
	(.006)	(.007)	(.005)	(.003)	(.002)	(.001)	(.002)	(.005)	(.003)	(.008)
Random Effects										
Residual	.000*	.000*	.000*	.000*	.000*	.000*	.000*	.000*	.000*	.000*
	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)

*** $p<.001$, ** $p<.01$, * $p<.05$

Chapter Summary

Chapter IV was a review of the results generated to answer the research questions. To answer Research Question I descriptive statistics were generated for both the aggregate FLSUS level and the individual FLSUS institution level. To answer Research Question II and III correlational analysis was run to investigate how the access metrics and student demographic characteristic variables related to the outcome metric, 1st-year retention rates. Finally, growth models were fitted to examine changes in the slope of the 6-year graduation and 1st-year retention rates. The exploratory nature of the research design resulted in a comprehensive reporting of the trends in the data selected for examination in this study. The next chapter provides a discussion of the results and their implications for the PBF policy in Florida.

CHAPTER V:
DISCUSSION

The purpose of this exploratory study was to determine what changes, if any occurred, regarding student access to and success within the FLSUS coincident to the implementation of PBF. This non-experimental study highlights trends in the data and does not imply PBF to have been a causation of change. The study included a focus on underrepresented minorities and students with lower socioeconomic statuses. Additionally, the study provides for review the differences between institutions based on their Carnegie Classification and their Minority Serving Institution status. This chapter includes an overview of the major findings and how they relate to the literature on PBF, implications of the study, and a discussion on the limitations of the study and recommendations for future research.

This chapter discusses the results that help to answer the research questions:

I. Coincident with the years before and after the implementation of PBF, what are the trends in the outcome metrics, access metrics, and student demographic characteristics
    a. at the FLSUS-level and
    b. at the FLSUS institution-level?

II. Coincident with the years before and after the implementation of PBF, what is the relationship between 1st-year retention rate and the access metrics and student demographic characteristics?

III. If the FLSUS institutions are divided into groups based on their institutional characteristics, is there a difference between the relationships of 1st-year retention rate and the access metrics and student demographic characteristics for each group?

IV. What is the average growth in 1st-year retention rates and 6-year graduation rates coincident to the years before and after implementation of PBF?

The following is a list of key findings from the exploratory study:

- FLSUS 6-year graduation rates have been higher than the most current national rate since the 2003 cohort and 1st-year retention rates were higher than the most current national rate through the entire study time frame. The acceptance rate of FLSUS institutions has been lower than the most current national rate throughout the study's time frame.
- The growth of FLSUS 6-year graduation and 1st-year retention rates did not show a significant change in slope after the implementation of PBF.
- Only two FLSUS institutions had average entering GPAs of 4.00 or higher the year prior to PBF implementation. In the final cohort understudy, that number increased to 6 of the 10 FLSUS institutions.
- Underrepresented minority student enrollment has remained flat since PBF implementation. Hispanic students showed a slight increase in enrollment and Black students showed a slight decrease.
- The rates of Pell Grant recipients increased rapidly prior to PBF implementation and were flat and declining after implementation. 7 of the 10 FLSUS institutions have

lower Pell Grant recipient rates in the most recent year of study than in the year prior to PBF implementation.

- There are significant differences in the relationship between 1st-year retention rates and the access metrics when comparing institutions by their Carnegie Classification and their Minority Serving Institution status.

Discussion of the Results

The central question of this exploratory data analysis seeks to understand the trends in the data surrounding the access to the FLSUS institutions and the success of students within those institutions. The literature provided the framework by which the study was undertaken by illuminating topics of interest related to PBF. To interpret the results this discussion will follow the same framework as the study itself by addressing the trends in the outcome metrics, the access metrics, the student demographic characteristics, and the differentiation in the outcomes by institutional type.

Outcome metrics (Research Questions I and IV). Evidence in the literature has pointed to mixed results from PBF policies. Most studies found little to no evidence of improvements in degree completions or retention rates (Hillman, Fryar, & Crespin-Trujillo, 2018; Hillman, Tandberg, & Fryar, 2015; Shin, 2010). Tandberg & Hillman (2014) saw evidence that given time a relationship between PBF and the rates were positive. The data collected in this study shows a similar trend. 6-year graduation rates and 1st -year retention rates increased coincident to the implementation of PBF in Florida; however, the growth models showed no significant change in in rise of rates after PBF implementation.

Shin (2010) concluded that the variation in retention and graduation rates under PBF policies were attributable more to institutional characteristics than PBF. The differences among the FLSUS institutions' 1st-year retention rates showed a similar trend in that FAMU had a lower retention rate in the most recent year understudy when compared to the year prior to implementation. FIU, FSU, and UCF were the only schools able to improve or remain at the prior year's rate every year after PBF implementation.

Access metrics (Research Questions I and II). Often cited in the literature related to the impacts of PBF is the increase in the selectivity of admissions (Dougherty et al, 2016; Hillman & Corral, 2018; Umbricht e al, 2015). The higher standards are likely to due to the fact that increased high school GPA and standardized tests scores of admitted students correlates positively with graduation and retention rates (Carnevale & Rose, 2003; Gansemer-Topf et al, 2017; Gansemer-Topf & Schuh, 2006). Evidence of an increase in selectivity of the FLSUS institutions coincident with PBF implementation was found in the data analysis of this study, as well. For instance, acceptance rates to the FLSUS were on the rise prior to PBF implementation and in the two cohorts after implementation but the rate has decreased in each of the last three cohorts under study. The trend in increasing high school GPA standards was also discoverable in the data. In the year prior to PBF implementation only two institutions had an entering average weighted high school GPA of 4.00 or higher while in the most recent cohort under study six institutions had averages at or over 4.00. The same was true for SAT scores, with average scores on the critical reading sections increasing from 20 to 70-points at the 25th percentile and 30 to 60-points at the 75th percentile.

The correlational relationship between 1st-year retention rates and the access metrics was also examined in this study. Similar to the research cited above, FLSUS institutions were found

to have strong, positive, and significant associations between retention rates and the GPA and SAT scores. The relationship to acceptance rate was moderate, negative, and significant. When examining these relationships separately for the years prior to and after PBF implementation no significant differences were found except between acceptance rate and retention rate. The relationship became weaker after PBF implementation and was significantly different from the relationship prior to PBF implementation. Since the direction of the relationship didn't change this difference may be meaningless.

Student demographic characteristics (Research Questions I and II). Often of concern in the PBF literature is the relationship between PBF policies and the enrollment trends of students from lower-socioeconomic levels and underrepresented minority students. For example, Rhoades (2012), found PBF policies were increasing the college achievement gap for both underrepresented minorities and students from lower-socioeconomic backgrounds. Similarly, Umbrict et al (2015) compared the admission rates of students from minority backgrounds and lower socioeconomic statuses to neighboring states and found PBF to have negative influence on their acceptance to non-open access institutions.

The trends in the data for the FLSUS institutions were more varied. Overall, minority enrollment which included Black, Hispanic, and Native Americans, was flat since PBF implementation but not for all groups. Hispanic enrollment increased or remained stable each year after PBF implementation, but Black student enrollment decreased or remained the same each year after PBF implementation. Hispanic enrollment was already increasing prior to PBF implementation. Of note, FAMU, the only FLSUS Historically Black University, decreased in minority student enrollment. Concurrently, according to Ray and Wang (2019), Florida's Hispanic 18-24 year old population increased 25% from 2010 to 2018 and the Black population

increased 3% in that same time period. Juxtaposed to this data, FLSUS institutions may not be keeping pace in their enrollment of minority students.

The study examined the percentage of FTIC students enrolled in FLSUS institutions who were awarded a Pell Grant as a proxy indicator for lower-socioeconomic status. The trends in these percentages more closely aligned with the literature as Pell Grant enrollment were on the rise prior to PBF implementation but plateaued or decreased in the years following PBF implementation. Seven of the institutions under study showed decreases in Pell Grant recipient enrollment when comparing the year prior to PBF implementation to the most current year under study.

This study also examined the relationship between 1st-year retention rates and student demographic characteristics. Only the percentage of Pell Grant recipients was found to have a significant correlational relationship to retention. The relationship was weak and negative. When examining these relationships prior to and after PBF implementation no significant differences were found between the two time periods. The percentage of Pell Grant recipients remained significant after PBF implementation was but not significant prior to implementation. Again the relationships were weak and negative. Only the percentage of Hispanic enrollment was found to have a positive relationship to retention rates. Possibly the homogeneity in minority enrollment across the FLSUS, with the exception of Miniority Serving Institutions, may explain the lack of relationship between the variables.

Institutional type (Research Question III). This study focused on two different institutional type groupings, Carnegie Classifications and Minority Serving Institutions or MSIs. The studies in the literature that focused on these groupings argued institutions in the Very High Research classification of the Carnegie Classification and predominately white institutions are

the better resourced institutions and thus have the capacity to meet standards set by PBF policies (Favero & Rutherford, 2019; Hamrick et al, 2004; Hillman & Corral, 2018). Through correlational analysis this study investigated relationship between retention rates and the access metrics and student demographic characteristics with comparisons between the different groupings.

Carnegie classified institutions with Very High Research showed to have a strongly positive and significant relationships between their retention rates and the access metrics, GPA and SAT scores. The same was not true for institutions classified as High Research or in lower classifications. Although positive relationships were found between GPA and standardized test scores and retention rates for the schools with High and lower classifications the relationships were not as strong nor were they found to be significant. This relationship suggests that for Very High Research institutions increases in GPA and standardized tests scores were associated closely with increases in retention rates but not for High Research and lower classified institutions. This provides an interesting counterpart to the fact that the four institutions with highest increases in high school GPA are classified as High Research and lower.

Also reported in the results is the comparison in relationships between retention rates and the student demographics for the different Carnegie Classifications. The High and lower classified institutions were found to have positive, significant relationships between the percentage of minority, Black and Pell Grant recipient enrollment and retention rates. Only, Hispanic enrollment was found to have a negative non-significant relationship. Conversely the relationship for High Research classified institutions were negative and significant for minority, Black, Hispanic, and Pell Grant recipient enrollment. Contextually, the Highest Research institutions all increased their minority enrollment from the year prior to PBF implementation to

the most current cohort while two of the High Research and lower classified institutions decreased minority enrollment over the same time frame comparison.

When comparing MSI institutions and non-MSI institutions and their relationships between retention rates and the access metrics significantly different results were found. Non-MSI had strong, positive significant relationships with both entering high school GPA and standardized test scores. MSI institutions showed to have weaker non-significant relationships. Contextually, over the study time period, MSI institutions had amongst the highest average GPA increases of all the institutions.

Contrary to the findings of the access metrics, MSI and non-MSI institutions were found to have similar relationships between retention rates and the student demographics. They only differed significantly on the relationship between 1st-year retention and the percentage of Pell Grant recipients. For MSI institutions there was a non-significant positive relationship and for non-MSI institutions there was a significantly negative relationship. Both MSI and non-MSI institutions were found to have strong, positive relationships between the percentage of Hispanic enrollment and 1st-year retention rates.

Implications of the Study

The research questions for this study were developed through a lens of resource dependence theory. A central tenet of resource dependence theory provides that "because an organization survives only to the extent it creates and maintains the coalition of support necessary for operation, the existence of competing demands can be a problem. Each time the organization satisfies the demands of one participant or interest group it simultaneously constrains its own behavior in meeting other or subsequent demands" (Pfeffer & Salanick, 2003,

p.29). To this end the research questions were written to guide exploration of the data trends of FLSUS institutions coincident to the implementation of PBF, a policy under which funding resources are appropriated based on institutional success in meeting specific metrics. It was hypothesized, given resource dependence theory that the FLSUS institutions would attend to the demands of the governor, the Legislature, and the FLBOG and in doing so would decrease access to the FLSUS to direct resources towards students that ensure success in meeting the PBF metrics.

The first key finding of the study points out that 6-year graduation rates and 1st-year retention rates were higher than the most recent national average before PBF implementation. Additional examination of the rate increases after PBF implementation showed no significant change. This is in context of having a lower acceptance rate than the national average throughout the study's time frame. Given this information it would suggest that PBF has less to do with the current 6-year graduation and 1st-year retention rates than does the trend in acceptance rates. The results that indicate an inverse relationship between FLSUS acceptance rates and retention rates would further suggest this may be the case. According to Campbell's Law "the more any quantitative social indicator is used for social decision-making, the more subject it will be to corruption pressures and the more apt it will be to distort and corrupt the social processes it is intended to monitor" (Campbell, 1979, p.85). In light of Campbell's concerns, it could be suggested that graduation and retention rates are in fact not meaningful indicators of success when they distort the fact that 50% of those who apply to the FLSUS are denied acceptance. This is an important implication because of the impact higher education can have on individual's earnings ability (Carnevale, Rose & Cheah, 2011; Tamborini, Kim & Sakamoto, 2015).

The rate of acceptance to FLSUS institutions may continue to decline under Florida's PBF policy given the trends in increasing average high school GPA and SAT scores. Although noteworthy decreases in minority enrollment enrollment did not result from this study neither did increases. Enrollment management practices could be at play in which FTIC cohorts are shaped based on a quota system in which a certain percentage of students from underrepresented groups are enrolled but the total number of all enrolled is varied, i.e. a school can decrease the overall number accepted to meet the specific ratio of enrollment for each race/ethnicity or socio-economic class. The variance in the rates of acceptance of each of the FLSUS institutions reported in this study may give credence to this theory. If this is the case, Campbell's Law would again be applicable.

The interpretation of the data from this study suggests that it is possible that metrics of the Florida PBF policy may not be true representations of the access to FLSUS institutions and the success of students within the FLSUS. Holding institutions accountable to easily "gamed" metrics may not result in true improvement of the FLSUS. Additional guard rails should be in place to ensure improvements are representative of an inclusive, public higher education system. This would require the governor, the Legislature and the FLBOG to direct resources toward the enrollment of students who are not those most likely to be retained and graduate. As suggested by Hillman and Corral (2018) additional student services and scholarship or grant resources could be funded to increase the capacity of FLSUS institutions to meet the needs of those who may be less likely to graduate. If resources are provided to work for students instead of resources provided to work toward metrics would could postulate given resource dependence theory that the FLSUS institutions would be freed to become more student-centered and less metric-centered.

Limitations of the Research and Recommendations for Future Research. A major limitation of this study is the restricted nature of the graduation and retention rate data. Only first-time-in-college or FTIC students who matriculated in the fall semester are included in these metrics leaving out a large percentage of the university enrollments. IPEDS recently began collecting data from institutions on the completions of their transfer-in students. The collection of the data will aid researchers in the future to open PBF studies to these populations. In the meantime, studies that examine institution-level data could close the gaps created by the narrow focus of graduation and retention rate metrics.

Another limitation of this study was adherence to only quantitative data analysis. Qualitative research could be employed to examine the previously mentioned limitation of the outcome metrics by studying how PBF has affected those non-FTIC students. Future research through qualitative methods could illuminate what is happening within the student services, admissions and enrollment management offices at the FLSUS institutions. Qualitative research should include thorough document reviews. Catalogs, marketing campaigns, and state accountability reports provide ample data that would allow a researcher to track over time the changes made, or services added or deleted in response to PBF policies.

A further limitation of this exploratory study was the choice to examine only the FLSUS institutions. As a result, this study lacks external validity as the results of this study are not generalizable beyond the FLSUS. Additionally, the lack of power from population size and years of study precludes the researcher's ability to imply causation from PBF implementation. However, limiting of the review to just Florida public universities was chosen because of the exploratory nature of the research design. Although limiting, exploratory studies such as this can

provide a gateway to more precise research on the impacts of PBF when additional data cohorts have been collected.

Conclusion

Funding based on performance has taken a hold in U.S. higher education over the past decade (Hillman, 2016; Boelscheer & Snyder, 2019). The funding models of PBF are implemented, theoretically, to improve the effectiveness and efficiency of colleges and universities (Hearn, 2015). Colleges and universities are held accountable to specified metrics by tying their performance in meeting the metrics to monetary funding but meeting those metrics might come at a cost to student access to higher education (Hillman & Corral, 2018; Hillman, Tandberg, & Fryar, 2015; Hillman, Tandberg & Gross, 2014). This study examined data from the Florida State University System (FLSUS) coincident with the policy being adopted in 2012 (Florida Board of Governors, 2014). The main focus of the study was on outcome metrics, access metrics, student demographic characteristic data, and on university classifications. From the data several trends emerged that may have implications for future research, specifically research into enrollment management policies of the FLSUS.

The trends in the outcome metrics, 6-year graduation and 1st-year retention suggest that the FLSUS was increasing in both rates prior to and after the implementation of PBF. The rise in the rates did significantly change after PBF implementation and the rates were higher than the current national averages over the study time frame. However, the lack of significant growth in the rates and the exploratory nature of the study impedes the researcher's ability to make any precise conclusions about the performance of the FLSUS on the outcome metrics coincident to PBF implementation.

Access to the FLSUS appears comparatively low to the rates of universities nation-wide. The average scores on admitted student high school GPA and standardized tests is increasing at all FLSUS institutions. The implication of these trends is that the FLSUS is becoming increasingly selective and may be creating barriers to students from disadvantaged backgrounds who historically have had limited access to challenging college preparatory coursework and have underperformed on standardized tests because of the potential bias in the tests themselves (Cokley et al, 2016). Some evidence of these barriers was found in the data of the enrollment rates of underrepresented minority students and those from lower socio-economic background. Results showed slight improvements for Hispanic students, but these rates lag far behind Florida's population increases in Hispanics who are 18-24 years old. Also potentially alarming is the year over year decrease in Pell Grant recipients since PBF implementation.

Also, of note are the results from the study of institutional classifications. The results suggest institutions who differ in their classification may also differ in the ways in which 1st-year retention rates and student demographics and acceptance rates and admissions standards relate to each other. These differences may indicate that different types of institutions vary in their ability to meet the metrics laid out in the PBF policy.

The prevailing take away from this study is that future research on the access to FLSUS institutions is warranted and even urgent. Data trends suggest that the FLSUS is becoming highly selective in acceptance of students while there is less evidence to suggest that graduation and retention rates are improving in any formidable way. The consequences of limiting access to public 4-year university education could be staggering for those most likely to be underserved by institutions of higher education. By adding to the knowledge base of the impacts of PBF through

future research, lawmakers could be convinced to rewrite policies to ensure equity under PBF policies for different student populations and different institution types.

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