AN ABSTRACT OF THE DISSERTATION OF

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Title: Evaluating Outcomes-Based Funding in Community Colleges

Abstract approved:

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Darlene F. Russ-Eft

Background: Legislators and higher education policy makers increasingly are turning to policy initiatives to incentivize institutions of higher education to transform policies and practices in the name of student success, with success typically defined as retention and graduation rates. One such policy receiving increased attention amongst states is outcomes-based funding, a state-level funding model that rewards institutions for better performance towards—or outcomes on—specific metrics.

Purpose: While research on the effectiveness of outcomes-based funding (OBF) towards achievement of state level metrics is growing for universities, little research exists as to whether such it is an effective policy tool for community colleges. Therefore, the purpose of this study was to examine whether states that implement an OBF model experience a statistically significant increase in student success indicators by aggregating community college student success data within each state.

Research Design: The unit of analysis for this study is states that implemented OBF for its public community colleges, noting that institutional data was aggregated to provide a state-level view of retention and completion rates. The population included individual states that dedicated a portion of funding towards enrollment, regardless of the level of funding or how

funding was administered. In support of advocacy coalition theory, this study employed a longitudinal analysis, measuring part-time student retention, full-time student retention, and completion rates over a 10-year period (measured at three years before and seven years after implementation of an OBF model). This framework yielded the five states included in this study: Arkansas, Indiana, New Mexico, Texas, and Washington. A right-tailed p-hat test was used to determine significance and binary regression analysis was used to control for variables known to positively affect retention and graduation rates

Findings: This study concluded that only three states experienced a statistically significant change over time in retention rates—Arkansas, Texas, and Washington, noting that Arkansas's change was negative. When controlling for the independent variables, results indicated that outcomes-based funding did not yield statistically significant results ($p > .95$) for retention rates. Additionally, this study found that only one state—Texas—experienced a statistically significant change in graduation rates and like Arkansas, this change was negative.

Conclusion: This study concludes, similar to other studies, that outcomes-based funding may not be an effective policy tool for increasing statewide student success metrics. Readers are cautioned, however, that these results study need to be taken in concert with findings from other current and future OBF research and that the analysis method used is not intended to demonstrate causality. A question for policymakers is whether OBF models should recognize the comprehensive mission of the community college or whether community colleges should begin a shift in their mission to address OBF models.. Future research possibilities include, but are not limited to, inclusion of other states as they adopt and sustain such models, as well as dedicate additional funds to performance; review of what characteristics of various outcomes-based funding models yield the greatest success; and the need for additional quantitative OBF research.

Evaluating Outcomes-Based Funding in Community Colleges

by
Alicia K. V. Moore

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Dean of the College of Education

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I understand that my dissertation will become part of the permanent collection of Oregon State University libraries. My signature below authorizes release of my dissertation to any reader upon request.

Alicia K. V. Moore, Author

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Chapter 1: Introduction

In 2009, President Barack Obama announced his plans for the *American Graduation Initiative* (The White House, 2009), an ambitious plan to increase significantly the number of U.S. college graduates by 2020. The centerpiece of this plan rested on increasing the percentage of adults who attained at least one year of post-secondary education; moreover, this plan placed community colleges in the center of reform efforts, and they have remained in the spotlight since. However, such reform efforts did not solely begin with a call from Obama; rather, the call for accountability received increased attention in the last decade, frequently manifesting itself in state-mandated performance indicators and more recently, a redirection of funds towards performance on those indicators (Alexander, 2000; Alstadt, Fingerhut, & Kazis, 2012; Dougherty & Reddy, 2011; Friedel, Thornton, D'Amico, & Katsinas, 2013; Jones, 2013; Mullin & Honeyman, 2007; National Conference on State Legislators [NCSL], 2013; Piper-Kenton, Huba, Schuch, & Shelley, 2004; Zarkesh & Beas, 2004). Termed "outcomes-based funding," the essence of this model is an attempt to incent colleges and universities to change systems, policies, and practices that increase institutional performance, with performance most frequently defined as certificate or degree completion and student retention (Alred, McClenney, Hudgins, & Ewell, 1999; Dougherty, Natow, Hare, & Vega, 2010; Friedel, et al., 2013; Zarkesh & Beas, 2004).

The tenets behind outcomes funding is based on Pfeffer and Salancik's (1978) resource dependency theory that indicates external drivers—such as state policy and funding—can drive organizational change. It is important to recognize that "all funding models create incentives for

institutional behavior" (Jones, 2013, p. 2) and that connecting funding towards certain goals is not a new concept in the world of higher education. Historically, the community college mission focused on access, and following suit, funding models supported community colleges based on the number of students enrolled. However, as attention has increasingly shifted the community college mission to focus on student success also —namely in the form of retention and completion—so, too, has state funding shifted.

At the same time that many funding models are shifting focus, overall state dollars supporting community colleges are on the decline. A recent report by the American Association of Community College (AACC, 2012) posited that "community colleges are not funded at a level permitting them to perform the monumental tasks expected of them" (p. 13). Supporting this bold claim are several studies demonstrating that state appropriations for higher education have been on a steady decline since the 1980's and are projected to continue declining in coming years (Lyall & Sell, 2006; Merisotis & Wolanin, 2000; U.S. Department of Education, National Center for Educational Statistics [NCES], 2011; U.S. Government Accountability Office, 2014). Combined, the national shift towards greater accountability, an increasing trend of funding based on performance, and the general decline in higher education funding pose significant challenges for today's community college leaders. To better inform the increasing volume of state policy decisions regarding community college funding—which ultimately impacts student success—this study examined whether outcomes-based funding (OBF) positively affects progress towards state-level community college accountability measures.

Purpose of the Study

Outcomes-funding first took root in Tennessee in 1979, with only a handful of states following suit through the latter half of the 1990's; during the last decade, however, as many as 39 states either implemented an OBF model (although some have since abandoned it) or are in discussions to do so (Friedel, et al, 2013; NCSL, 2013). Despite the increase in the number states adopting educational outcomes and shifting funds towards those outcomes, existing research continually has concluded that outcomes funding does not reach the goals it set out to achieve (Dougherty & Natow, 2009; Dougherty, Natow, & Vega, 2012; Sanford & Hunter, 2011; Shin, 2009; Shin & Milton, 2004). While limitations of existing research are fully vetted in Chapter 2, the most significant of these is that current research is predominantly qualitative in nature, focuses on Tennessee, or concentrates on universities; few studies exist that employ a quantitative approach, adopt a national perspective, or focus on the community college experience. Therefore, the purpose of this study was to examine whether states that implement an outcomes-based funding model experience a statistically significant increase in student success indicators by aggregating community college student success data within each state.

Significance of Study

Given the United States' position as a higher education leader, the number of bachelor degree (and higher) graduates it produces is surprising. According to the Organisation for Economic Co-operation and Development (OECD) "Education at a Glance: OECD Indicators 2012" reported, the U.S. ranks 14th in the world in the percentage of 25- to 34-year olds who hold a higher education degree. The report continued to state that only 29% of U.S. youth whose

parents did not earn a post-secondary credential will earn their own college or university degree, placing the United States as 25th of the 27 OECD countries for this metric. Moreover, U.S. national data regarding student retention and completion has posed equally as compelling reasons for the community college shift towards student success. ACT's 2010 report, "What works in student retention? Fourth national survey: Community colleges report," indicated that only 56% of first-time, full-time students returned a second year, while the U.S. Department of Education's National Center for Education Statistics (2013) data indicated that 20% of all first-time, full-time students complete an associate degree within three years. Finally, with U.S. occupations that require a community college vocational certificate or associate degree projected to grow at a higher percentage than all other job categories (Executive Office of the President, 2009), it is not surprising that state accountability efforts are focusing on community college student success.

As more and more states direct a portion of community college funding to performance on various outcomes, it is imperative that the research demonstrate whether such models are effective and provide insights for those in positions to affect such funding models. As such, answers to this study's research questions have both scholarly and practical application. From a scholarly perspective, current OBF research falls short in many areas. First, the depth of available research is limited compared to many other long-studied higher education topics; where it does exist, it predominantly focuses on specific states (e.g., Hillman, Tandberg, & Gross, 2012; Sanford & Hunter, 2011) or almost exclusively on university-level performance (e.g., Fryar, 2011; Shin, 2009; Shin & Milton, 2004). Additionally, while several strands within the

existing research focus on why OBF models fail (e.g., Dougherty & Natow, 2009; Dougherty, Natow, & Vega, 2012), relatively little research exists as to whether successful models exist. Finally, much of the research is qualitative in nature, often providing a historical account or current status of a specific state's funding model (e.g., Alstadt, Fingerhut, & Kazis, 2012; Burke & Serban, 1998; Harbour, 2002; Jones, 2013); as such, the research may not have applicability to other locales. Finally, the qualitative nature of much of the existing research leaves gaps in the literature that may appeal to more quantitatively-minded audiences (e.g., Dougherty, Natow, & Vega, 2012; Nisson, 2003). To fill in some of these literature gaps, this study conducted a quantitative analysis of community college student success benchmarks, aggregating student success data within each state that adopted an OBF model in the previous two decades. As such, the results of this study fills in gaps within the existing literature by providing a quantitative examination of outcomes-based funding within a community college setting, as well as reviewing data at a national and longitudinal level, considerations missing from much of the existing research.

As discussed previously, an increasing number of states are shifting a portion of community college funding to focus on performance towards state-mandated outcomes via legislative action (Alexander, 2000; Alstadt, Fingerhut, & Kazis, 2012; Dougherty & Reddy, 2011; Friedel, et al., 2013; Jones, 2013; Mullin & Honeyman, 2007; NCSL, 2013; Piper-Kenton, et al., 2004; Zarkesh & Beas, 2004). It is important to note that until recent years, nearly all states dedicated only a small portion of funds towards outcomes performance, ranging anywhere from 0.1% to 7% (Alstadt, Fingerhut, & Kazis, 2012; Burke & Serban, 1998; NCSL, 2013;

Petrides, McClelland, & Nodine, 2004). Once again, however, the state of Tennessee is leading community college funding reforms, and recently shifted 100% of state-level community college funding to an outcomes model. Since then, numerous other states are in discussion to or adopted a phased in approach to increase significantly the percent of funds dedicated towards outcomes performance; as of this writing, these new allocations range from 15% to 100% dedicated towards outcomes performance (Jones, 2013; NCSL, 2013). Given the momentum by which states either are adopting outcomes funding models or are increasing the proportion of funds dedicated to such models, the study presents important practical implications, in addition to filling in literature gaps. Perhaps the largest impact is for those legislators, higher education leaders, and many national nonprofit organizations seeking to support student completion. Each of these potential audiences have a significant impact on funding in that legislators often direct the amount and application of funds, institutional leaders attempt to influence the amount and source of funds, and nonprofit organizations more and more frequently provide the funds. Higher education leaders, in particular, have indicated that funding—both the level of and the model itself—is of primary concern amongst all potential leadership issues (Li, Friedel, & Katsinas, 2012). In addition to those leading higher education reform efforts, this study provides practical direction for on-campus leaders. While many four-year universities have long had various student success initiatives in place, many of these activities are new to the community college world. As such, results of this study have practical application for on-campus leaders as they determine which initiatives help advance student success and possibly, increase institutional resources. Therefore, it is critical that higher education policymakers, leaders, and faculty and

staff have a solid, data-driven foundation by which to make funding policy and institutional operational decisions.

Research Questions

Given the need to maximize public resources in the face of greater calls for accountability, the purpose of this study was to examine whether states that implement an outcomes-based funding model experience a statistically significant increase in student success indicators by aggregating community college student success data within each state. To this end, research questions included:

1. What are the differences over time in community college student *retention* for states with outcomes-based funding model?
2. What are the differences over time in community college student *graduation rates* for states with outcomes-based funding model?

The research questions endeavor to fill two of the more significant literature gaps by focusing on: (a) community colleges (as opposed to universities) and (b) *all* states whose community colleges are subject to an outcomes funding model (as opposed to just one state). Unlike universities—the subject of the majority of outcomes funding studies—community colleges almost exclusively focus on teaching and admit a very diverse and often academically underprepared population (AACC, 2012; Cohen & Brawer, 2008). Such mission differentiation and student mix make community colleges a unique focus for this study. More importantly, however, as the community college mission has expanded from solely access to include both access and success, many community colleges have implemented student retention and

completion strategies that have long been part of a hallmark of university student support services; examples of these include mandatory orientation, academic planning, early warning systems, and first year experience programs. Given the differences in missions and student populations, as well as the increased focus on student success, it is critical to examine the effectiveness of outcomes funding in the community college environment. Finally, these questions also test the shift from an enrollment-funding to outcomes-funding model. With a long history of solely funding community colleges based on the number of students enrolled (Burke, 2005; Goldstein, 2012; Jones, 2013), the shift in funding towards outcomes assumes that performance towards various metrics will also shift—presumably in a positive direction. Ultimately, the research questions tested this assumption. From a pragmatic perspective, community colleges have shifted significant resources, critically examining and redesigning policy, practice, research, funding, and leadership in support of increased performance on student success metrics. At the same time, legislatures and state governing boards are directed more funding and creating legislation increasingly targeted towards student success related activities. Therefore, the research questions posed for this study attempted to determine if all of the time and attention towards such efforts yield the intended outcomes.

Outcomes of this study may also inform state-level policy, providing insights for higher education leaders in positions to influence public policy regarding community college funding models. Moreover, while most states dedicate relatively small portions of funding towards outcomes, more and more states are increasing this proportion. To illustrate, Ohio dedicated 20% of outcomes funding to outcomes in 2013; Louisiana, Indiana, and Tennessee increased its

outcomes funding allocation to 25% of their higher education funding formulas in 2014; and Arkansas is scheduled to increase to 25% by 2018 (Alstadt, Fingerhut, & Kazis, 2012). Such levels are in marked contrast to historical allocations. As more states move this direction, such actions intensify the need for legislators and higher education leaders to have a solid, data-driven foundation by which to make such decisions.

Given the mission differentiation between community colleges and universities, the increased attention on student success within a community college setting, and the tenets of resource dependency theory, this researcher hypothesized that states which dedicate a portion of community college funding to student success outcomes will realize a statistically significant increase in those outcomes. If this is proven otherwise, the findings will lead to additional research questions, among which are identifying why a model did not achieve its outcomes or whether the level of funding is sufficient enough to impact outcomes achievement.

Delimitations

While detailed in Chapter 3: Methodology, the following highlights the delimitations of this study. First, as few studies exist that examine the impact of community college outcomes funding over time, and recognizing that the effects of new student success initiatives takes time to yield results, this study employed a longitudinal analysis, measuring part-time student retention, full-time student retention, and completion rates three years before and sever years after implementation of an OBF model. The population included individual states that dedicated a portion of funding towards enrollment, regardless of the level of funding. It identified whether states allocate outcomes-funding in addition to its base funding (referred to performance-funding

1.0) or integrate OBF into its base funding formula (referred to as performance-funding 2.0) (Dougherty & Reddy, 2013). Finally, only those states who actually implemented outcomes-based funding and funded it for at least seven years after implementation were included in this study (as opposed to those who adopted such a model, but never funded it or abandoned it within a short period after adoption).

Clarification on Terminology

Recent literature varies in terms of key definitions associated with outcomes-funding. In some cases, it points to *outcomes* funding (e.g., Alstadt, Fingerhut, & Kazis, 2012; Jones, 2013), while in other instances it points to *performance*-funding (e.g., Dougherty & Natow, 2009; Dougherty, Natow, & Vega, 2012; Friedel, Thornton, D'Amico, & Katsinas, 2013; Zarkesh & Beas, 2004). At the same time, much of the literature uses outcomes (or performance) *budgeting* (e.g., Andrews & Hill, 2003), while others use outcomes (or performance) *funding* (e.g., Dougherty & Natow, 2009; Jones, 2013; Sanford & Hunter, 2011); in some cases, researchers use both terms (e.g., Shin, 2009; Shin & Milton, 2004). While some researchers offer up a distinction between performance versus outcomes or budgeting versus funding, no one consistent definition for any of these terms appears to exist. It is important to note that a strong distinction has been made to differentiate between "performance funding 1.0" and "performance funding 2.0". Performance funding 1.0 was the original concept of rewarding institutions for performance; key tenets of this model typically limited institutions to completion metrics and often only funded performance if additional state funding existed or as a bonus on top of base appropriations. Performance funding 2.0, on the other hand, tends to fund a broader range

metrics, including progression, and is incorporated into the base funding model (Dougherty & Reddy, 2011). Regardless, given the assumptions supporting resource dependency theory, this study included any state which dedicates funds towards or as a reward for an increase in state student success metrics.

Summary

The centerpiece of a strong economy is closely tied to the availability of a trained and skilled workforce. As the U.S. economy recovers from the 2008 recession, job growth for those individuals with a post-secondary credential—particularly a community college vocational credential—is on the rise. If community colleges are going to meet President Obama's challenge of increasing the number of students with a post-secondary certificate or higher degree, and hence, contribute to a skilled workforce, they must embrace the expanding community college mission and begin making significant progress this direction. Since the mid-1990's, many state legislatures or governing bodies have not waited for community colleges to take action, but instead, have implemented state funding policies that attempt to advance the success mission. The theory behind such action appears to be straightforward: If organizations are given monetary reward for achievement of certain outcomes, the organization will shift policies and practices to increase performance towards those outcomes. When applied to outcomes funding models in the university setting, the literature indicates that this theory does not play out as predicted as outcomes models typically do not yield the intended student, institution, or state achievement goals. However, many of these efforts are not well tested in the community college environment, despite the time, personnel, legislation, and dollars deployed towards such efforts;

as such, this study provided a foundation by which to make future data-driven decisions regarding community college state funding policies by testing whether such models positively impact student success outcomes. Therefore, the purpose of this study was to examine whether states that implement an outcomes-based funding model experience a statistically significant increase in student success indicators by aggregating community college student success data within each state. To this end, the research questions are:

1. What are the differences over time in community college student *retention* for states with outcomes-based funding model?
2. What are the differences over time in community college student *graduation rates* for states with outcomes-based funding model?

In support of these questions, this study examined if implementation of an outcomes-based funding model made a statistically significant difference in student success outcomes for all states that adopted an outcomes-based funding model since 2000 or later. Given the lack of research that examines the longer-term impacts of outcomes-based funding, and because outcomes-funding is often used as a state-level policy used to affect long-term change, this study employed a longitudinal approach, measuring part-time student retention, full-time student retention, and completion rates three years before and seven years after OBF implementation.

Chapter 2: Literature Review

For much of their existence, community colleges have operated quietly behind the scenes and while they certainly garnered attention from their surrounding communities, little attention was given by the state, and nearly no attention at the federal level. In the last two decades, however, this slowly began to change. First, an inherent distrust of public organizations began to emerge across the United State in the mid-1990's, which brought some attention to public higher education (Alexander, 2000; Sanford & Hunter, 2011) and resulted in the reporting of state-mandated accountability measures (Alexander, 2000; Friedel, et al, 2013; Mullin & Honeyman, 2007; Piper-Kenton, Huba, Schuch, & Shelley, 2004; Zarkesh & Beas, 2004). More recently, however, thanks in part to the attention by President Obama's *American Graduation Initiative* as well as the 2008 recession, community colleges have become front and center in the discussions about improving America's economic standing through the development of a more educated workforce (Executive Office of the President, 2009; Friedel, et al, 2013). This is seen not only at the federal level but is a centerpiece of discussions amongst many higher education non-profit organizations, including Complete College America, Gates Foundation, and the Lumina Foundation, among others.

Such attention is now manifesting itself in the ways in which community colleges are funded. Historically, community colleges were funded based on the number of students enrolled; with the need for a more educated workforce and with increasing calls for accountability, community college funding is quickly shifting from funding based on enrollment to funding based on performance, with performance most frequently measured by state

accountability metrics (Alexander, 2000; Dougherty & Reddy, 2011; Friedel, Thornton, D'Amico, & Katsinas, 2013; Jones, 2013; Mullin & Honeyman, 2007; NCSL, 2013; Piper-Kenton, Huba, Schuch, & Shelley, 2004; Zarkesh & Beas, 2004). Initially termed "performance-based funding" (PBF), the goal of this model was to increase institutional performance towards state educational goals and reward institutions accordingly. Interestingly, at the same time PBF models were developing, state-level funding (the primary source of many community college budgets) was on the decline. To illustrate, a recent report by the American Association of Community College (2012) posited that "community colleges are not funded at a level permitting them to perform the monumental tasks expected of them" (p. 13), while longitudinal research has indicated that this downward direction in funding is not short term in nature, but instead, is a long-term trend reaching back to the mid-1980s (Lyall & Sell, 2006; Merisotis & Wolanin, 2000; U.S. Government Accountability Office, 2014).

In 1979, Tennessee was the first state to shift community college and university funding to performance towards specific outcomes. While a handful of other states adopted a similar model, it was not until recent years that this model gained significant momentum; at recent count, 39 states either implemented a PBF model (although some have since abandoned it) or are in discussions to do so (Friedel, et al, 2013; NCSL, 2013). Given the rapid pace by which PBF is being considered across the United States, it is imperative that policy makers have a data-driven foundation by which to make funding decisions. To this end, this section describes the approach to the literature review, criteria for inclusion and exclusion of key search terms, central themes and theories that emerged from the review, and a critique of the existing research.

Approach to Literature Review

The State of Oregon, the researcher's home state, is currently actively engaged in developing performance-based funding models for its higher education institutions. Using terms often discussed in state- and institution-level meetings, the research initially yielded few results. However, by conducting an in-depth review of the reference lists associated with the initial few articles, the researcher was able to discover new key word terminology and identify leading authors or researchers on the topic of performance-based funding. As a result, key search terms were expanded to include accountability, performance-based funding, outcomes funding, performance indicators, community college funding, student success metrics, educational policy, and policy analysis; in many cases, these terms were filtered on either "higher education" and/or "community colleges."

Primary databases included Academic Search Primer, Associates Programs Source Plus, Business Source Primer, ERIC/Education Resource Information Center, Professional Development Collection, Vocation and Career Collection, and ProQuest. Additionally, the researcher contacted two individuals, one of whom is frequently identified as a leading researcher on performance-based funding and the other of whom currently is providing PBF policy-level support to multiple states engaged in this topic; both individuals were able to help further identify seminal studies and terminology. Finally, four key questions guided the literature search:

1. What are the different types of U.S. community college funding models?

2. What states have community college funding models based on achievement of key performance indicators?
3. What research exists to determine whether or not the funding models achieved their intended outcomes?
4. Are there differences between achievement of key performance indicators for states with performance-based funding models and those who have primarily an enrollment-driven model?

Criteria for Inclusion and Exclusion

The above questions yielded few studies that focused on the effectiveness of PBF models, the intended focus of this study. Instead, the review indicated that relatively little research exists in this regard and that most research focuses on one of five areas: the history and/evolution of PBF, impacts of PBF within the university setting, summaries of existing models, political motivations for establishing performance-funding, and comparisons of initial and more recent iterations of performance funding models. Nearly all of the political or policy-based literature called out its limitation as applicable only to that state's context; as such, the findings are not easily transferable to other states. Therefore, the literature review excluded studies that focused only on a specific state's political or policy motivations. Additionally, because attention regarding community college accountability metrics has only recently become part of the national conversation, research regarding key performance indicators was limited only to those articles that helped define the history of how, when, and where PBF models evolved. Finally, because the literature suggested that funding models are continually in flux across the country,

the literature regarding effectiveness was confined to more recent studies only as more frequently than not, current models more closely align with emerging funding models.

Literature Review: Key Themes

This literature review is organized into four sections based on key themes that emerged from the literature, each of which are important to understand the research questions and set the context for this study. The first section summarizes the historical context that served as the foundation for key performance funding, while the second section shifts to the present day to define the status of community college funding models. Section three describes the research findings regarding the effectiveness of PBF, and section four discusses the reasons why it failed in many states. Additionally, the final two sections discuss some of the relevant theories supporting existing PBF research, as well as a critique of the existing research.

Historical context and foundation for performance funding. Historically, public colleges and universities received little scrutiny from legislatures and the public. However, this confidence appears to have eroded during the past two decades as the governing bodies are "no longer willing to accept peer-review and accreditation as satisfactory forms of accountability" (Sanford & Hunter, 2011, p. 4). In an attempt to improve outcomes, many states began requiring institutions to adopt and report on key performance indicators (KPIs) as a means of measuring institutional and state performance. In order to more strongly tie accountability to appropriations, multiple states also recently shifted from solely requiring a reporting of KPIs to tying funding directly to KPI performance; hence the term 'performance funding' (Alexander, 2000; Outcalt & Rabin, 1998; Shin, 2009; Zarkesh & Beas, 2004).

Performance funding initially focused on KPIs such as completion and transfer, often ignored the unique nature of many institutional missions, did not provide opportunities for institutional participation, and offered performance funding as a "bonus" rather than part of the base funding allocation; this approach was termed "PBF 1.0" by Dougherty and Reddy (2011). As a result of this limited approach, PBF 1.0 failed in nearly every state and was frequently discontinued (Dougherty & Natow, 2009; Dougherty, et al., 2012; Dougherty & Reddy, 2011; Friedel, et al., 2013; Harnisch, 2011).

Beginning in the latter half of the 2000's, renewed interest in accountability pushed governing bodies to be more intentional in establishing KPIs and associated appropriations. Characteristics of this new approach, termed "PBF 2.0", included opportunities to engage institutional leaders in the planning process, align state and institutional KPIs, and adopt KPIs that differentiated not only between the community college and university mission but also acknowledged the unique student populations at both types of institutions (Alred, et al., 1999; Alstadt, Fingerhut, & Kazis, 2012; Dougherty, et al., 2010; Friedel, et al., 2013; Harnisch, 2011; Zarkesh & Beas, 2004). With this refocusing, language regarding this funding model shifted from "performance" towards "outcomes"; as such, more recent literature uses the phrase "outcomes-based funding".

As states adopted outcomes-focused funding formulas, two primary models emerged:

- Performance-based (or outcomes-based) budgeting (PBB): PBB allows state agencies and/or legislatures the discretion to appropriate state funds based upon KPIs; typically, the allocation of funds is not guaranteed annually and may be *in addition* to the base

funding formula (Burke, Rosen, Minassians, & Lessard, 2000; Sanford & Hunter, 2011; Shin & Milton, 2004).

- Performance-based (or outcomes-based) funding (PBF): PBF models directly link state funding to KPIs, with the KPIs typically agreed upon between the state and institutions; PBF models are usually *included within* the base funding formula (Dougherty & Reddy, 2011; Friedel, et al., 2013; Harnisch, 2011; Sanford & Hunter, 2011; Shin & Milton, 2004).

Regardless of the approach, both models attempt to incentivize colleges and universities to improve institutional and state benchmarks. Therefore, for the purposes of this study, the term "outcomes-based funding" was used to represent any allocation of funds towards performance on state indicators.

Status of community college funding models today. According to Friedel, et al. (2013), community colleges represented "the sector of U.S. higher education that has seen the most state-level legislative activity in recent years" (p. 1), with the majority of that activity focused on funding and/or funding models (NCSL, 2013). Due to the constantly changing state of community college funding, determining which states have an OBF model is difficult to pinpoint, as is determining the percentage of funding dedicated to outcomes and/or the outcomes themselves. Regardless, the research indicated that while initial OBF funding started in Tennessee, several states adopted this model in the forthcoming decades only to abandon them by the early 2000s. Since then, however, significant momentum has propelled this as a key issue for many states. According to the literature, 26 states adopted a OBF model in the early the

2000s, with more recent research indicating that 39 states either currently have a OBF model in place (noting that some may have since abandoned it) or are in discussions to do so (Alstadt, Fingerhut, & Kazis, 2012; Friedel, et al., 2013; Mullin & Honeyman, 2007; Mullin & Honeyman, 2008; NCSL, 2013; Piper-Kenton, et al., 2004).

It is important to note that the amount of funds dedicated to OBF models varies widely from state to state. Historically, most OBF models allocated between 0.5% to 7% towards achievement of outcomes (Alstadt, Fingerhut, & Kazis, 2012; Friedel, et al., 2013; Mullin & Honeyman, 2007; Mullin & Honeyman, 2008; NCSL, 2013; Piper-Kenton, et al., 2004; Sanford & Hunter, 2011). It is only in recent years that many states significantly increased this allocation or approved plans to do so in near the future. For example, Ohio dedicated 20% of OBF funding to outcomes in 2013; Louisiana, Indiana, and Tennessee increased OBF allocations to 25% of their higher education funding formulas in 2014; and Arkansas is scheduled to increase its OBF funding to 25% by 2018 (Alstadt, Fingerhut, & Kazis, 2012).

Why outcomes-based funding failed. Previous discussions indicated that OBF models gained some momentum in the 1990s; however, it is important to note that by the early 2000s, nearly all states abandoned OBF models for a variety of reasons. A summary of the literature suggests that OBF failed for the following reasons:

- Adopting KPIs that do not acknowledge both progression and completion metrics (Alstadt, Fingerhut, & Kazis, 2012; Dougherty, et al., 2012; Dougherty & Reddy, 2011; Harnisch, 2011);

- Adopting KPIs that do not acknowledge the complexities associated with first-generation, students of color, low-income, or other at-risk student factors (Alstadt, Fingerhut, & Kazis, 2012; Harnisch, 2011);
- Lack of significant funding levels tied to KPIs, performance funding supplanting a portion of the base funding formula, or a disappropriation of outcomes-funding in difficult budget times (Alstadt, Fingerhut, & Kazis, 2012; Dougherty, et al., 2012; Dougherty & Reddy, 2011; Harnisch, 2011);
- Not providing institutions ample time to change policies and practices to align with state educational goals (Alstadt, Fingerhut, & Kazis, 2012; Harnisch, 2011); and
- Inadequate consultation with institutions, which resulted in a lack of buy-in from campus stakeholders, including faculty (Alstadt, Fingerhut, & Kazis, 2012; Dougherty, et al., 2012; Dougherty & Reddy, 2011; Harnisch, 2011).

The above research provides the basis by which legislators and other higher education policy makers may chart a future path for developing successful funding models. However, none of these studies provided a quantitative analysis to determine what percent of funding dedicated to OBF is most effective in helping institutions achieve state-level educational goals, nor do they identify which KPIs are most effective in helping to achieve those goals. And while the descriptive nature of these studies is helpful, the lack of quantitative studies does not provide a comprehensive picture by which legislators and others may make a more well-rounded decision. Therefore, a challenge for future research will be to quantify some of the above research areas as a means of further determining whether OBF is an effective policy tool.

Effectiveness of outcomes-based funding. The volume of research attempting to evaluate the effectiveness of outcomes-based funding is limited; the few in-depth studies that do exist each come with their own limitations and are discussed throughout this section. Despite these limitations, the conclusions were consistent in that OBF models appear not to make a statistically significant difference in key performance indicators; the exceptions that do exist are frequently determined to be outliers.

In one of the few longitudinal studies, Sanford and Hunter (2011) examined the impact of outcomes-funding on institutional outcomes over a 15-year period using a spline linear mixed models approach. Based on their research, they found that increases in retention and graduation rates did not correlate with adoption of an outcomes-funding model. Moreover, they determined that doubling the monetary commitment to performance funding did not influence retention rates. However, it is important to note that this study focused solely on public four-year universities in Tennessee; it did not address community colleges or other states and as such, is limited in its applicability outside of Tennessee universities.

Focusing on research universities, a 2009 study by Jung Cheol Shin used a hierarchical linear growth curve analysis to determine whether the adoption of OBF affected university performance, which he defined by graduation rates and federal research funding levels. Based on this analysis, Shin concluded that OBF did not noticeably increase institutional performance. Shin's work focused exclusively on public four-year-or-more research institutions, a designation that does not fit many regional public four-year universities or community colleges. Additionally, this study utilized graduation rates from the Integrated Postsecondary Education

Data System (IPEDS), which does not account for transfer student completion rates; with transfer students comprising nearly 30% of university students, this study missed the analysis of a significant portion of students nationwide (Hossler, Shapiro, & Dundar, 2012). Moreover, this study used federal research funding as one outcome, a metric that does not typically apply within the community college environment.

In one of the few nationwide state-level studies, Shin and Milton (2004) used a hierarchical linear modeling growth analysis and concluded that graduation rates in states with OBF was not greater than in states without this funding model. This was later confirmed in two other multivariate studies, one focused on Tennessee and one at a national level (Fryar, 2011; Volkwein & Tandberg, 2008). Like the previous studies discussed above, each of these studies considered only public four-year universities and did not analyze OBF effectiveness for community colleges, and they focused only on "first-time-in-college" students, rather than providing a more comprehensive review of all student types. As such, this study's methodology may be worth replicating but with a focus on community colleges rather than universities.

In addition to the above OBF-focused studies, Titus (2006) initiated a study to determine which student, institution, and state funding variables positively affected student completion. While Titus' study made several conclusions, most pertinent to this literature review was his conclusion that state-level need-based aid positively correlated to student completion, as did a high level of state operational dollars. This latter finding suggested that a significant increase in OBF appropriations may increase institutional performance towards state KPI's.

Most aligned with the purposes of this study was recent work by Tandberg, Hillman, and Barakat (2014) that focused on the impact the introduction of performance funding programs had on two-year degree completion for states engaging a performance funding model. Using a differences-in-difference technique, this study found mixed results in that six states realized lower completion rates, four states had greater completion rates, and findings for nine states was inconclusive. As such, the researchers concluded that outcomes funding is not a "'silver bullet' for improving community college completions" (p. 2) and that instead, it may impede national completion goals.

It is important to note that while OBF studies have concluded that such funding models have not achieved their intended student success outcomes, OBF models had positive immediate and intermediate impacts on institutions. According to Dougherty and Reddy (2011), newly adopted OBF models tended to increase institutional employee knowledge regarding state and institutional education goals and awareness of institutional priorities, while intermediate impacts included significant changes to academic and student services policies, practices, and organizational structures; these assertions were supported by Friedel, et al. (2013) in their policy issue brief for the University of Alabama's Education Policy Center. Regardless of these shorter-range impacts, Dougherty and Reddy (2011) concluded that OBF models do not cause substantive changes to student learning outcomes or institutional KPIs.

While each of the studies discussed above indicated that outcomes-based funding does not positively affect student outcomes, the research was limited in that these studies predominantly focused on the university experience, almost wholly ignoring the community

college. Additionally, none of the studies appeared to have been replicated, leaving readers questioning whether the findings are time- or context-specific only. OBF policymakers would benefit by replication of these studies as they are, and/or with the inclusion of either community colleges or other states. Finally, the above studies focused on OBF 1.0 models; as states implement OBF 2.0 models, it is imperative that researchers replicate and/or expand on existing studies to better compare and contrast OBF 1.0 versus 2.0, both from a qualitative and quantitative perspective.

Emerging Theoretical Foundations

A review of outcomes-based studies indicated that resource dependency theory serves as the primary theory supporting the majority of OBF research. However, research that focused on policy development associated with OBF models included elements of the advocacy coalition framework and theories of action; all three are briefly described below.

Resource dependency theory. Social organizational theory is the groundwork for resource dependency theory, which "seeks to explain organizational and inter-organizational behavior in terms of those critical resources that an organization must have in order to survive and function" (Johnson, 1995, p. 1). A primary component of resource dependency theory is the influence that external pressures or constraints have in determining organizational decisions, actions, and directions as the organization strives to increase its resources (Piper-Kenton, et al., 2004). Resource dependency theory was particularly evident in the works by Piper-Kenton, Huba, Schuch, and Shelley (2004), Shin (2009), Tandberg, Hillman, and Barakat (2014), and Titus (2006). Because this researcher's interest was whether OBF models are an effective state-

level policy tool that increase statewide achievement of student success outcomes, resource dependency theory served as the primary theoretical foundation guiding this study. Details regarding this theory and its application to this study are more fully explored in chapter three.

Advocacy coalition framework. The advocacy coalition framework reviews the influence of advocacy associations on policy development and organizational structure. Grounded in Simon's organizational theory of grounded rationality (Dougherty, et al., 2010), the advocacy coalition framework model requires that policy has been in place or developed during a minimum 10-year period (Sabatier, 1999). This model could serve as a research foundation if studying those states that have had an outcomes-based funding system for more than 10 years.

Theories of action. In its most simplistic description, Argyris and Schön (1996) posited that the theory of action is the ability to produce the same outcome by taking the same steps in the same circumstances. This theory parallels policy instrument theory (McDonnell & Elmore, 1987) which defines what mechanisms can translate policy goals into consistent, concrete, replicable actions. In other words, if a policymaker wishes to make "X" happen, requirements "A, B, or C" must take place. The common link in application of this theory to performance studies is the consistent use of retention and/or completion as a key policy outcome. Theory of action was used by Dougherty and Reddy (2011), Li, Friedel, and Katsinas (2012), and Tandberg, Hillman, and Barakat (2014).

Critique of the Literature

The above literature review painted a broad picture of the history and effectiveness of outcomes-based funding in U.S. colleges and universities; of important note was that this

literature concluded that outcomes-based funding does not appear to yield its intended results of increasing performance towards student success benchmarks. Overall, research on this topic was limited in the sheer number of available studies and predominantly focused on the university experience or on the state of Tennessee; given the unique nature of state funding models, governing organizational structures, and educational priorities in each state, this research may not translate well to community colleges and/or other states. Additionally, there was no apparent replication of the studies, leaving readers questioning the consistency within the findings themselves. Moreover, research reviewed to date indicated that typically less than 5% of state revenues are directed towards institutional performance (NCSL, 2013). As such, research is needed to determine if OBF 1.0 as a funding model is ineffective in and of itself or if it is ineffective as the budget implications are not substantial enough to warrant significant institutional change. Additionally, the reviewed research was primarily (although not exclusively) qualitative and descriptive in nature, providing historical accounts of the reasons for implementing, the failure of, and/or current status of OBF. The few quantitative studies that did exist predominantly used regression analyses as the study methodology and perhaps other statistical analysis methods may expand findings. Albeit through replication or new studies, an additional body of quantitative inquiry, with varied statistical models and triangulation of results, is needed to build a comprehensive body of research. Finally, future studies may also wish to consider utilizing a mixed methods approach to appeal to the varied needs of potential audiences.

Topics for Future Research

Given the gaps in the current literature, significant opportunities for future research exist. Among these include measuring the effectiveness of OBF over time via quantitative studies, determining what levels of funding may incentivize colleges and universities to change practices in support of state or institutional education goals, and focusing research on community colleges and/or states other than Tennessee. Additionally, given the tenets of resource dependency theory, the primary theory supporting much of the existing research, research findings regarding the "ineffectiveness" of OBF provokes questions regarding whether or not the dollars dedicated to OBF are sufficient to achieve their intended goals and presents opportunities for further research in this regard. Additionally, perhaps as more states become practiced with either OBF 2.0 or allocate larger dollars to outcomes-funding, the tenets supporting the advocacy coalition framework may better inform the focus of future studies.

Summary

A review of the literature on outcomes-based funding (OBF) yielded significant findings, particularly in regards to the lack of research focused on this topic. Key themes emerging from the literature indicated that while historically, implementation of OBF waxed and waned across the United States, recently it is more and more frequently being used as a state-level policy tool to affect institutional performance on student success metrics. Regardless, the second primary theme pointed to the ineffectiveness of such approaches in that with few exceptions, OBF models do not appear to positively influence university-level performance measurements; in fact, in one of the few studies focused on community colleges, the researchers asserted that such

funding models may actually interfere with completion goals. Through the use of qualitative studies, another central research theme in a variety of studies pointed to the reasons as to why OBF has not been effective; among these are that the lack of alignment of the chosen metrics with institutional mission or types of students served, inconsistent or low-level of funding associated with outcomes, and a lack of involvement from key stakeholders. And while the theoretical foundations vary from study to study, the literature review indicated that resource dependency theory serves as the predominant theory guiding many OBF studies, and in particular, those with a quantitative focus.

Findings from this literature review expanded this researcher's baseline knowledge of community college funding models, historical funding trends for higher education, and the history and evolution of outcomes-based funding. Surprising to this researcher was the limited overall volume of research regarding OBF effectiveness, especially given its strong presence in higher education legislation in recent years, as well as the lack of quantitative studies and focus on the community college experience. These findings aside, this researcher was struck most by the consistent conclusions that indicate current OBF models do not appear to make statistically significant impact on student success (and in one case, may actually negatively affect student success).

With state-level policy increasingly focused on OBF models and/or increasing OBF dedicated funds, it is critical that the existing limited body of research be expanded in order to allow policymakers to make the most effective and informed decisions possible. The findings from the literature greatly influenced the focus, purpose, research questions, and methodological

approach to this study. To this end, the purpose of this study was to examine whether states that implement an outcomes-based funding model experience a statistically significant increase in student success indicators by aggregating community college student success data within each state. In support of this purpose, research questions include:

1. What are the differences over time in community college student *retention* for states with outcomes-based funding model?
2. What are the differences over time in community college student *graduation rates* for states with outcomes-based funding model?

With these research questions, this study examined all states that employed an enrollment-funding model and all states that dedicated a portion of funding to outcomes, noting that only those states whose funding model remained consistent during the study period were included. Given literature review findings that highlighted the need for further research on OBF models within the community college environment, and limited volume of longitudinal studies on OBF in any institutional setting, this study employed a longitudinal approach focused on community colleges only, examining performance on student retention and completion metrics between 2004 to 2014. Finally, because outcomes-funding wes often used as a state-level policy tool to affect statewide change, this study examined performance at a state-level, rather than institution level. Further details regarding methodology are detailed in Chapter Three.

Chapter Three: Design and Methods

Perhaps no other time in the history of United States has nearly every state—and indeed, the nation—focused its educational energies towards community colleges so intensely as is happening today. Whether one considers President Obama's push for 5 million more graduates by the year 2020, the call for reform outlined in the American Association of Community College's *Reclaiming the American Dream* report (2012), or individual state reform initiatives, the push for community colleges to 'do better' is omnipresent. Responding to these directives, the higher education marketplace has increasingly promoted a variety of change strategies; examples include the Lumina Foundation's Achieve the Dream initiative, John Gardner's Foundations of Excellence program, the Gates' Foundation Completion by Design project and the Institution for Higher Education Policy's Project Win-Win. While all of these initiatives have varied goals, they hold one primary outcome in common; that is, a focus on student success, most frequently defined retention and/or as certificate or degree completion.

At the same time these private financing initiatives have begun to take root, community colleges are experiencing a change in state funding that attempts to financially incentivize colleges to increase performance on state-mandated metrics; like their private organization counterparts, state legislatures frequently measure community college performance on student retention and/or certificate and degree completion. Seen as a state-level policy tool, such models are termed performance- or outcomes-based funding. As reviewed in chapter two, 39 states now either provide some level of financial gain for institutions that yield increased performance towards a variety of student success metrics or are in the process of implementing such accountability measures. To better inform these policy decisions—which ultimately affect

student success—this study examined whether outcomes-based funding (OBF) positively affects progress towards accountability measures. To this end, this chapter focuses on the study design and methods needed to analyze the research questions and hypothesis, the researcher's philosophical orientation, guiding research theories, audience, study time period, analysis method, data description, and methodology limitations.

Research Questions and Hypothesis

As a broad topic, this study investigated the effectiveness of community college outcome-funding models. More specifically, however, was a focus on whether implementation of an outcomes-based funding model makes a statistically significant improvement in community college student success outcomes. Additionally, recognizing that it takes time for outcomes of many policy directives to be realized, this study examined the research questions at various stages both pre- and post- OBF implementation. To this end, research questions include:

1. What are the differences over time in community college student *retention* for states with outcomes-based funding model?
2. What are the differences over time in community college student *graduation rates* for states with outcomes-based funding model?

Compared to many higher education topics, the depth of research on OBF is limited: relatively few quantitative studies exist and among those that do, they predominantly focused on OBF in the university setting or within the state of Tennessee, the state with the longest and most stable OBF model. This study built on existing quantitative research but shifted its focus to the community college. Despite the research that performance funding appears to have had no

statistically significant effect on university completion and retention rates, this researcher posited that the differences between universities and community colleges are substantial enough to warrant a separate investigation on community colleges. As such, this study hypothesized that states that dedicate a portion of community college funding to student success outcomes would realize a statistically significant increase in those outcomes. Assessing this hypothesis is a critical element to having data-informed decisions behind the recent nationwide interest in outcomes-based funding and its application as a state-level policy tool supporting student progression and completion. The study expands upon the existing body of literature, directly addressing many of the literature gaps, and provides a solid foundation for applying its findings within higher education planning, leadership, and budgeting.

Philosophical Orientation

In the world of research, the quantitative worldview can be succinctly defined as a research approach that objectively investigates a hypothesis using scientific or mathematical means, regardless if the research focus is from the physical or social science realms (Creswell, 2012; Given, 2008; Johnson & Onwuegbuzie, 2004; Pole, 2007; Sampson-Gruener, 2013). Perhaps most striking about the quantitative paradigm is the role of the researcher; under this worldview, the researcher has an obligation not only to remove his/her biases from the research process but also "remain emotionally detached and uninvolved with the objects of study" (Johnson & Onwuegbuzie, 2004, p. 14). Finally, quantifiable data and measurement are central to the data analysis process.

Multiple philosophies underlie the above description; moreover, they served as the foundation guiding this study. *Objectivism* posits that quantitative research conclusions are "reliable, replicable, and generalizable" (Pole, 2007, p. 35) as the research analysis is conducted using mathematical and statistical means. By the use of such analysis, the research is void of the researcher's personal bias and therefore, hypotheses can be objectively tested. From this perspective, this study employed a statistical approach to expand upon existing research and provide reliable and more replicable findings, ones that apply to more than a single state. Additionally, the quantitative approach aims to remove some of the bias typically challenged in the qualitative approach. *Positivism* is similar to objectivism in regards to objective inquiry, but it also asserts that such an approach allows the research to also be "time- and context-free" (Johnson & Onwuegbuzie, 2004, p. 14), thereby increasing the ability to make broad-based predictions about future occurrences. Under this perspective, this study used a longitudinal approach to measure performance three years before and seven years after implementation for all states that utilized an OBF approach to funding. As such, this study attempted to determine whether findings hold true over time *and* across state boundaries, essentially testing the "time and context-free" aspect of positivism, and allowed for greater application of findings compared to other studies that employ a much narrower approach. Additionally, the methods—further discussed below—attempted to demonstrate whether there is an association between funding and student success rates, as well as an ability to predict application of such funding models to other states, further addressing the context aspect of positivism.

As a researcher and practitioner, this philosophical approach is appealing personally in that, while I believe in the value of a "good story" as a means of capturing someone's attention, I also believe that the story needs to be supported by objective, and preferably replicable, facts; in the world of research, the quantitative approach most aligns with these facts. As a practitioner, I have testified in front of the Oregon State Legislature and the (former) State Board of Education. It has been my experience that leadership often proposes legislative or policy initiatives based on a personal experience (aka, the "story"). However, those providing testimony—albeit in an informational or advocacy role—must justify their stance using reliable, accurate data in order to best influence the discussion. Given the rapidity with which OBF is being enacted across the country, having data-driven research that can sit beside the already existing qualitative research is critical to influencing state-level discussions. Moreover, the ability to combine the story (qualitative research) with data (quantitative research), aligns with my personal epistemology and will be helpful to my desired future professional path.

Theoretical Foundations

A review of performance-based studies indicated that resource dependency theory (Pfeffer & Salancik, 1978) has served as the primary theory supporting the majority of OBF quantitative research. However, research focusing on the policy development and impact aspect of OBF models also included elements of the advocacy coalition framework (Sabatier, 1999). Both of these theories serve as the theoretical foundation for this study and are briefly described below.

Resource dependency theory. Social organizational theory is the groundwork for resource dependency theory, which "seeks to explain organizational and inter-organizational behavior in terms of those critical resources that an organization must have in order to survive and function" (Johnson, 1995, p. 1). Ultimately, resource dependency theory posits that organizations are inextricably tied to the conditions of their environment and will respond to or adapt to those conditions in order to maximize resources (Pfeffer & Salancik, 1978). A primary component of resource dependency theory is the influence that external pressures or constraints have in determining organizational decisions, actions, and directions as a means of increasing organizational resources (Piper-Kenton, et al., 2004).

Recent calls for greater accountability within higher education have prompted many legislative and governing bodies to implement OBF models under the assumption that institutions are more likely to change their practices in order to meet state benchmarks if there is an incentive to do so. In turn, institutions recognize the growing scarcity of state resources and shifting funding policies; as such, community colleges adapt policies, practices, and services to maximize state funding streams to the greatest degree possible. Ultimately, resource dependency theory posits that, as resources become more scarce, the organization's "survival is contingent upon its ability to adapt" (Sanford & Hunter, 2011, p. 7). Like Sanford and Hunter's study, resource dependency theory served as the central tenet supporting this study's hypothesis: assuming state appropriations continue their decline, community colleges will adjust policies, practices, and services in pursuit of greater performance on state-level student success metrics, which ultimately yields a greater portion of state revenues.

Advocacy coalition framework. As this study was concerned with analyzing and ultimately, better informing, state-level policy decisions, it was important to consider the role of public policy theory. One such policy, the advocacy coalition framework, is founded on five key tenets: (a) the role of scientific and technical information play in policy development; (b) the need to allow policy to develop over time in order to best understand its influence; (c) a focus on the "policy subsystem," that is the target of the policy itself; (d) the vast array of players influencing and responding to policy; and (e) policies as simply translations of belief systems, albeit personal, organizational, or governmental.

While each of these tenets could influence this study, three in particular play a central role. First, the advocacy coalition framework reviews the influence advocacy coalitions have on policy development and the organizational structures that respond to that policy. To effectively study the influences of and outcomes from such coalitions, the advocacy coalition model requires that policy be in place or in development during a significant period of time, with 10 years as the frequent minimum benchmark. This approach recognizes that complex organizations—such as colleges and universities—often need time in which to shift policies and practices in support of new directives (Sabatier, 1999); it is only after such a period of time that the true effect of new policies can be adequately measured. Recognizing that states often provide several years' notice prior to OBF implementation—which allows institutions to begin shifting practices well before implementation—this study reviewed student retention and completion data three years before and seven years after implementation covering a span of 10 years.

The advocacy coalition framework also focuses on understanding the subsystem targeted by the policy, rather than focusing on the larger political system. While OBF models certainly influence individual community college actions, ultimately, such funding models are attempting to improve student success metrics across the entirety of the state; as such, the larger political system is state-level legislation, while the subsystem are the community colleges as a collective whole. As such, this study focused on community colleges, while aggregating student success data for the entirety of each state utilizing an OBF model.

Finally, the advocacy coalition framework recognizes that policies (albeit at the institution or state level) are simply a means for translating beliefs, principles, or values. As discussed in previous chapters, community colleges were founded on the values of access and affordability, and funding models followed suit. However, these foundational values have expanded recently to incorporate student success as a central tenet to the community college mission. By shifting funding models to incentivize institutions for greater performance towards student success metrics, states are ultimately reflecting their value of student success through changes to funding policies.

Audience

The governing structure of U.S. community colleges vary greatly as some are seen as system-level organizations (meaning that individual institutions are subject to state-directed policies and practices and are often coordinated by a centralized, state-level organization) or locally controlled (meaning that each college is independent of a state organization, aside from limited policies and funding mechanisms) (Cohen & Brawer, 2008). Regardless of the

governing structure, the primary beneficiaries of this study are those individuals—albeit at the institution or state level—responsible for setting and influencing community college funding models. Due to the lack of research regarding whether or not performance-based funding is an effective funding model for community colleges, it is critical that these individuals have a solid foundation by which to make funding model decisions.

The primary audience—that of policymakers—can be defined as the 'primary stakeholders' for this study, as defined by Russ-Eft and Preskill (2009). It is also important to recognize that other stakeholders—termed secondary and tertiary stakeholders—may benefit from this study. Assuming key institution-level staff are consulted prior to implementation of a funding model, secondary stakeholders (those who have a stake in and are immediately affected by a program's outcomes) include instructional, fiscal, student services, institutional effectiveness, and other senior institutional-level leaders. Tertiary stakeholders—those who have an interest in the outcomes but are not usually involved at an operational level—include board members/trustees, peer institutions in other states, and those engaged with community college and higher education research.

Study Time Period

Because practice indicates that student success strategies often take several years to realize a return, and using the advocacy coalition framework which calls for studying policy implications over a longer period of time, this study utilized a longitudinal approach by reviewing retention and graduation rates three years before adoption and 10 years later. The rationale behind selection of the initial date is that typically, discussions regarding outcomes-

based funding begin long before implementation and with potential implementation a signal of change in funding, many institutions begin adapting policies and practices prior to when the actual shift in funding begins. Given that the vast majority of states implemented in the early 2000s and later, this study reviewed only those states that implemented OBF in the 2000-01 academic year or later. Furthermore, significant quality control changes took place with this study's primary data set in 2000, which provided researchers with more reliable and consistent data; such action further justified using this date as the starting point for this study. Finally, the study time period was adjusted to include those states that implemented PBF in 2003 or later as 2003-04 represented the first year in which institutions were required to report retention rate data as part of its national data reporting requirements.

Analysis Method

A review of the literature suggested that few quantitative studies exist and of those that do, most limit their focus on just one state or even just one institution. Moreover, many of the leading OBF studies employed a cross-sectional approach, which focuses on a specific point in time, rather than weighing the long-term effects of OBF as a policy change instrument, as called for under the advocacy coalition framework. Therefore, this study attempted to fill some of these research gaps by employing a longitudinal analysis, running different statistical methods at consistent points before and after OBF implementation for all states included in the study.

In order to determine whether the introduction and implementation of OBF has statistically significant impact on retention and graduation rates, the researcher conducted a two-part statistical analysis. First, this project conducted a right-tailed p-hat test to determine

whether, over time, if there was a statistically significant positive change in retention or graduation rates for each state in the study. In alignment with the researcher's hypothesis that OBF produces a positive impact on retention and graduation rates, this study then conducted a binary logistic regression analysis for states that experienced a positive statistically significant change in either or both retention and graduation rates. Such an approach allows the researcher to determine whether such change happened due to random chance or as a resulting influence of the control variables. The p-hat test was conducted using Microsoft Excel, while the regression analysis was done via IBM's SPSS statistical analysis software.

Data Description

As noted previously, many of the existing studies are limited in their application to the community college environment. In support of expanding the existing research and filling in some of the literature gaps, this section describes the unit of analysis, population, dependent variables, independent variables, and data sources.

Unit of analysis. The unit of analysis for this study is states that implemented OBF for its public community colleges, noting that institutional data was aggregated to provide a state-level view of retention and completion rates. The rationale for selecting states as the unit of analysis is that increasingly, performance funding is being used as a state-level tool to effect state-level performance (Alexander, 2000; Alstadt, 2012; Bogue & Johnson, 2010; Dougherty & Reddy, 2011; Fryar, 2011; Shin, 2009; Tollefson, 2009). Research indicated that three primary funding models exist: (a) states that integrate a portion of performance funding into its base funding model; (b) states that dedicate a portion of funds to performance but set those dollars

aside in a pool separate from the base allocation; and (c) states that 100% of funds directed towards enrollment. Given the purpose of this study, this study included only those states that adopted OBF—regardless of the funding structure or amount—during the study time period. Initially, the researcher identified 19 states that adopted OBF on or around 2000-01 or later. However, due to limitation of data and in support of the research questions and theoretical foundations supporting this study, this study only included those states whose data was available through the Integrated Post-Secondary Education Data Set (IPEDS) and whose funding model had enough lasting power to align with the points-in-time in which the data was assessed. As a result, the final sample included five states: Arkansas (22 community colleges), Indiana (22 community colleges), New Mexico (19 community colleges), Texas (64 community colleges), and Washington (20 community colleges), noting that Washington schools that shifted to recently offering bachelor degrees were excluded from the sample due to difference in institutional mission. To determine these five states, this study relied on previous research from Alstadt, Fingerhut, and Kazis (2012), Dougherty and Reddy (2013), Jones (2013), and Tandberg, Hillman, and Barakat (2014). If there were conflicts in the research as to when OBF was implemented in a particular state, the implementation date was confirmed in discussions with the state-level community college office for various states (J. Haygood, personal communication, April 4, 2015; C. Lobaugh, personal communication, June 12, 2015).

Dependent variables and data source. The dependent variables used in this study were part-time student retention rates, full-time student retention rates, and graduation rates, noting that part- and full-time retention rates were combined by determining their weighted average.

The rationale for this direction is that the large number of part-time community college students far outweighs the number of full-time students; combining the two provides a more accurate representation of community college retention rates. Retention and graduation rates were selected as the response variables as they are the most commonly used student success performance indicators in OBF states (Dougherty & Reddy, 2011; Zarkesh & Beas, 2004) and are readily available through the National Center for Education Statistics' (NCES) Integrated Postsecondary Educational Data Set (IPEDS); for purposes of this study, IPEDS "provisional release" data was used as these data have undergone all NCES quality control procedures. IPEDS defines graduation rate as full-time, first-time, certificate- or degree-seeking students in a cohort year who earn a certificate or degree within 150% of time to completion; the rate is calculated based on the number of completers divided by the number of students in the cohort. Retention is defined as 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" (IPEDS, 2013) and is available for part-time and full-time students. Given the structure of IPEDS data, and the focus of this study, a p-hat test was conducted only for each state's certificate- or degree-seeking students; students not pursuing a degree were excluded.

Data source validity. It is important to note the validity of the data available through IPEDS is strong in that all colleges and universities in the country are required to provide data in a consistent fashion using the same definitions; such actions provide researchers with like data from all institutions and all states. Because there is room for human error in entering data into IPEDS, IPEDS regularly conducts data validity assessments to refine data definitions and work

with institutions or states who may not be accurately reporting data. Additionally, IPEDS conducted an in-depth study in the early 2000s to assess the quality of its data. Work from this task force yielded an online reporting system that included built-in quality checks and a process that allowed institutions to correct their data retroactively. This report concludes that the IPEDS reporting process allows for consistency in institutional data reporting; full details are available at http://nces.ed.gov/pubs2005/2005175.pdf

Independent variables and data source. Given the longitudinal focus of the advocacy coalition framework, the primary treatment variable was OBF program stability, or more specifically, those states whose funding model remained in place for seven years after implementation (or rather, 10 years after the initial measurement period). The control variables for regression analysis were the state-level characteristics known to influence graduation and retention rates: level of state operating grants, unemployment rates, minority student enrollment, and budgeted instructional expenses; a description of each variable, its data source, and research supporting its inclusion are detailed in Table 3.1.

Methodological Limitations

As with all studies, this study's methods come with limitations. First, IPEDS graduation data are limited to full-time, first-time students and retention to first-time students; this model excludes transfer students who represent a significant portion of community college enrollment (Bahr, 2009; Hossler, Shapiro, Dundar, Ziskin, Chen, Zerquera, & Torres, 2012a, 2012b) and non-degree seeking students who may need a series of classes to advance within their career and/or transfer to another college or university. Further, IPEDS graduation data do not include

certificates of completion, a terminal credential typically offered by many community colleges. Finally, IPEDS only began collecting graduation rate data in 1998 and retention rates in 2003; therefore, any study wanting to conduct a longer-term analysis that includes these variables may be challenged to find such data via a single source. However, for lack of other national, single-source data set, IPEDS serves as the foundation for many similar studies and as such, provided a comparator between this and related studies.

The independent variables also bring limitations. The original study conducted by Shin and Milton (2004) included college preparation as a state-level control variable as it is often cited as a strong factor influencing retention and graduation rates; however, their study focused on four-year institutions and comparable data are not available for community colleges. It is also important to note that Shin and Milton included whether institutions had a residence hall as an institution-level control variable as this service consistently demonstrates positive correlation to increased university retention and graduation rates. With less than 3% of community colleges having residence hall facilities (U.S. Department of Education, 2013), this also was excluded as a control variable.

Strategies to Protect Human Subjects

The student researcher completed the CITI certification. Although the study used existing and de-identified databases and focused on experiences of states rather than of individuals, the principal investigator and the student researcher provided the needed documentation to the Oregon State University Institutional Review Board and were given approval to move forward with this study.

Summary

The theory behind OBF appears to be straightforward: If organizations are given monetary rewards for certain outcomes, the organization will shift policies and practices to increase performance towards those outcomes; in some instances, the effects of such policy changes cannot be seen until sufficient time has passed by which the organization may respond to the change. When applied to OBF models in the university setting, the literature indicates that this theory does not play out and OBF models do not yield the intended student, institutional or state achievement outcomes. However, the limitations within the existing literature call for this study to provide greater depth in the available number of quantitative studies and for a focus on community colleges. Therefore, the purpose of this study was to examine whether states that implement an outcomes-based funding model experience a statistically significant increase in student success indicators by aggregating community college student success data within each state. In support of this purpose, research questions include:

1. What are the differences over time in community college student *retention* for states with outcomes-based funding model?
2. What are the differences over time in community college student *graduation rates* for states with outcomes-based funding model?

To assess the research questions, this study employed a two-part statistical analysis, conducting a p-hat test to determine whether a statistically significant increase in retention or graduation rates existed during the study time period. If so, a binary regression analysis was conducted to control for various independent variables known to influence retention and

graduation rate data. To this end, this study's dependent variables were community college part- and full-time student retention and completion rates, aggregated to the state level. To best account for state-level factors known to influence student retention and completion, independent variables included level of state operating grants, unemployment rates, minority student enrollment, and percent of funds budgeted towards instructional expenses.

Table 3.1

Control Variable Description

Independent Variable	Description	Data Source	Past Research
Level of State Operating Grants	Percent of state funds dedicated to community college operating budgets; determined by dividing state appropriations and state operational grants by total operating expenses.	IPEDS	Durkin & Kircher, 2010; St. John, Hu, & Weber, 2001; Titus, 2006.
Unemployment Rates	The lowest rate of unemployment that an economy can sustain over time, which recognizes that there will always be some level of unemployment due to movement of individuals between jobs (U.S. Federal Reserve Board of Governors, 2013)	U.S. Department of Labor	Heller, 1997
Minority Student Enrollment	Percent of minority student enrollment, excluding Asian-Americans and international students; determined by dividing degree-seeking, first-time, fall minority student headcount by total degree-seeking, first-time, fall headcount.	IPEDS	Calcagno, Bailey, Jenkins, Kienzel, & Leinbach (2007)
Budgeted Instructional Expenses	Percent of budget dedicated to community college instructional expenses; determined by total instructional expenses by total budget.	IPEDS	Calcagno, Bailey, Jenkins, Kienzel, & Leinbach (2007); Durkin & Kircher, 2010

Chapter Four: Data Analysis

The purpose of this study was to examine whether states that implement an outcomes-based funding (OBF) model experience a statistically significant increase in student success indicators by aggregating community college student success data within each state. In particular, this study examines whether implementation of OBF positively influenced retention and graduation rates, the two most commonly used metrics in OBF models. Chapter four addresses the findings by first reporting on the sample and basic data regarding the response variables. It continues to provide a summary of the findings from the statistical analysis conducted on each state.

Sample Description

Initially, this study set out to evaluate each state that implemented OBF on or around the 2000-01 academic year; this yielded 19 possible states. This number quickly lessened as many states did not sustain the model for more than 10 years, some never implemented the model, and retention rate data were not available via the Integrated Post-Secondary Data Set (IPEDS) until 2003. As such, the final number of states included in this study was five: Arkansas, Indiana, New Mexico, Texas, and Washington. Interestingly, all of these states implemented (or in some cases, re-implemented) outcomes-based funding in 2007-08; the same implementation years meant that data were collected at the same points in time for all five states, thereby creating the possibility of greater consistency in influences of potential independent variables. Finally, for purposes of reviewing retention data, only students who were first-time, part or full-time, and degree-seeking students were evaluated; for graduation rate data, only students who were full-

time, first-time, degree seeking students were evaluated. Due to data limitations, discussed in chapter three, this sample does not include students who have prior college credit (i.e., transfer in students).

Dependent Variables

For each state included in this study, the researcher collected retention and graduation rate data three years before and seven years after OBF implementation. As previously discussed, three years before was selected as a data collection point to acknowledge that many institutions will, in support of resource dependency theory, begin implementing changes to affect retention and graduation outcomes prior to actual OBF implementation in order to maximize state resources as soon as possible. Collecting parallel data seven years after implementation acknowledges that change within institutions of higher education takes time before any significant results may be seen (advocacy coalition framework). Therefore, retention data were collected for fall 2004 and fall 2013 (IPEDS measures retention by determining the number of students who start in one fall term and the percent who return the following fall), while graduation rate data were collected for the 2004-05 and 2013-14 academic years. Table 4.1 provides a summary of the dependent variable data collected for this study, noting that raw data are available in Appendix A.

Independent Variables

As discussed in chapter three, a binary regression analysis was conducted to control for the influence of factors (independent variables) known to influence retention and graduation rates. The independent variables included in this study were the percent of state operating grants

as a portion of the total budget; state unemployment rate percent; percent of minority student enrollment as a portion of first-time, degree-seeking headcount; and percent of funds budgeted towards instructional expenses. Table 4.2 provides a summary of the independent variable data collected for this study, noting that 10 year longitudinal data is available in Appendix B.

Data Analysis: Retention Rates

The first research question tested in this study asked whether there was a statistically significant change in part- and full-time student retention rates after implementation of outcomes-based funding. To aid in this analysis, the researcher determined the weighted average of part-time and full-time student retention rates and conducted a right-tailed p-hat test to determine significance. (The two proportion Z-tests, also called a p-hat test, measures proportions and is based around the normal distribution; thus, unlike a t-test, it does not use degrees of freedom.) Based on this analysis, Arkansas's change in retention rates between 2004 and 2013 was statistically significant, although change was negative. Indiana experienced a small decrease in its retention rates, but was not statistically significant. While New Mexico's overall retention rate percentage increased between 2004 and 2013 by 0.7%, this increase was determined not to be statistically significant. Both Texas and Washington saw an increase in retention rates between 2004 and 2013, and these increases were determined to be statistically significant. Table 4.3 summarizes the retention rates and p-values for each state.

The researcher's hypothesis was that states that dedicate a portion of community college funding to student success outcomes will realize a statistically significant increase in those outcomes over time. The p-hat test determined that two states had a statistically significant

increase in retention rates (Texas and Washington), while one state (Arkansas) had a statistically significant decrease. To test the researcher's hypothesis, a binary regression analysis was conducted for all states in order to assess the influence of the independent variables on the dependent variables. To do so, the researcher first transformed the continuous dependent and independent variables to categorical variables (G. Sampson-Gruener, personal communication, November 15, 2015). For states that did not experience a statistically significant change, the dependent variable was coded as a "0", while states that did experience a statistically significant change were coded as "1". Independent variables were measured against a standard and assigned a "0" if, over time, the fell below that standard, or a "1" if they exceeded that standard. For the level of state operating grants, minority student enrollment and budgeted instructional expenses variables, no "industry standard" exists by which to compare each state's performance. Therefore, the research college data for each state, as well as for the national average, for the 10 years in the study; these data were then used to transform the variables based on the number of years the state exceeded or fell below the national average. For unemployment rates, economists define the "natural unemployment rate" as the lowest rate of unemployment an economy can sustain over time or rather, when all who want a job are employed. The natural unemployment rate, as well as each state's unemployment rate, were collected for each year of the study; as with the other independent variables, the data were transformed based on the numbers of years state exceeded or fell below the national natural unemployment rate. Transformed variable information is listed in Table 4.4, while raw data are available in Appendix C.

Counter to the researcher's hypothesis, results from the binary regression analysis indicated that outcomes-based funding did not yield statistically significant results ($p > .95$) for retention rates, even when controlling for independent variables known to impact retention rates.

Data Analysis: Graduation Rates

The second research question tested in this study asked whether there was a statistically significant change in student graduation rates after implementation of outcomes-based funding. To aid in this analysis, the researcher intended to use the same statistical texts as used to assess retention rates; that is to first conduct a right-tailed p-hat test, followed by a binary regression analysis. Indiana was not included in the p-hat test as its graduation rate percentage remained the same between 2004-05 and 2013-14. Of the remaining states, three of four experienced no statistically significant change in graduation rates. As percentages, both Arkansas and Washington saw a small decrease, although the decrease was not statistically significant. At the same time, New Mexico experienced a slight increase in graduation rates, but not to the degree that yielded statistical significance. The analysis of one state, Texas, indicated that while Texas also experienced a decrease in graduation rates during the 10-year period of this study, the decrease was enough to be statistically significant. Table 4.5 summarizes the graduation rate and p-values for each state, noting that raw data are available in Appendix A.

The researcher's hypothesis was that states that dedicate a portion of community college funding to student success outcomes will realize a statistically significant increase in those outcomes over time. In analyzing graduation rates, the p-hat test determined that Texas was the only state to experience a statistically significant difference, and counter to the researcher's

hypothesis, the change was negative. Because no state experienced a statistically significant positive change in its graduation rates, the researcher did not proceed to a binary regression analysis.

Summary

The purpose of this study was to analyze whether states that implement outcomes-based funding experience a statistically significant increase in student success indicators by aggregating community college retention and graduation rates within each state. To do so, the researcher conducted a right-tailed p-hate test to determine significance and a binary regression analysis to control for variables known to influence retention and graduation rates.

Counter to the researcher's hypothesis that the introduction of outcomes-based funding would have a statistically significant impact on retention and graduation rates, this study concluded that only three states experienced a statistically significant change over time in retention rates—Arkansas, Texas, and Washington, noting that Arkansas's change was negative. When controlling for the independent variables, however, results indicated that outcomes-based funding did not yield statistically significant results ($p > .95$) for retention rates. Additionally, this study found that only one state—Texas—experienced a statistically significant change in graduation rates and like Arkansas, this change was negative; as such, the researcher did not conduct the second statistical analysis—a binary regression test—for graduation rates.

Table 4.1

Dependent Variable Data

State	Retention Rates (%)[1]: 2004-05	Retention Rates (%)[1]: 2013-14	Graduation Rates (%): 2004-05	Graduation Rates (%): 2013-14
Arkansas	52.11	48.96	23.82	22.18
Indiana	44.80	43.90	9.00	9.00
New Mexico	45.47	46.17	13.47	14.00
Texas	45.37	48.36	17.70	16.33
Washington	55.69	57.58	32.56	31.56

[1] IPEDS provides retention rates for part- and full-time students. The percent listed in this table represents the weighted average of these two numbers.

Table 4.2

Independent Variable Data

State	2004-05	2013-14
Arkansas		
State Operating Grants (%)	48.1	39.1
Unemployment Rates (%)	5.7	7.4
Minority Student Enrollment (%)	24.3	32.8
Budgeted Instructional Expenses (%)	34.5	39.8
Indiana		
State Operating Grants (%)	50.0	36.3
Unemployment Rates (%)	5.2	7.7
Minority Student Enrollment (%)	22.7	26.7
Budgeted Instructional Expenses (%)	35.9	37.8
New Mexico		
State Operating Grants (%)	98.8	97.6
Unemployment Rates (%)	5.7	6.9
Minority Student Enrollment (%)	60.4	68.4
Budgeted Instructional Expenses (%)	34.0	37.3
Texas		
State Operating Grants	32.4	99.0
Unemployment Rates (%)	6.1	6.2
Minority Student Enrollment (%)	44.7	61.2
Budgeted Instructional Expenses (%)	39.2	41.7
Washington		
State Operating Grants	44.0	36.5
Unemployment Rates (%)	6.2	7.0
Minority Student Enrollment (%)	15.3	29.6
Budgeted Instructional Expenses (%)	37.9	40.7

Table 4.3

Retention Rates and p-Values by State

State	2004-05 Retention Rate (%)	2013-14 Retention Rate (%)	p-value
Arkansas	52.11	48.96	.999
Indiana	44.86	43.99	.738
New Mexico	45.47	46.17	.169
Texas	45.37	48.36	4.62E-47
Washington	55.69	57.59	.001

Table 4.4

Transformed Variables[1] Description: Retention

State	State Operating Grants	Unemployment Rates	Minority Student Enrollment	Budgeted Instructional Expenses	Retention
Arkansas	1	0	0	0	0
Indiana	1	1	0	0	0
New Mexico	1	0	1	0	0
Texas	0	0	1	1	1
Washington	1	1	0	1	1

1 0 indicates that the state fell below the national average 50% of more of the time; 1 indicates that the state exceeded the national average 51% or more of the time.

Table 4.5

Graduation Rates and p-Values by State

State	2004-05 Graduation Rate (%)	2013-14 Graduation Rate (%)	p-value
Arkansas	23.82	22.18	.500
Indiana	9.0	9.0	n/a
New Mexico	13.47	14.0	.194
Texas	17.7	16.3	1.0
Washington	32.56	31.56	.931

Chapter Five: Discussion

An educated, trained and skilled workforce is the cornerstone of a robust and resilient economy. According to Alstadt, Fingerhut, and Kazis (2012), economists have warned that there are too few skilled college graduates—especially those with the technical training provided by community colleges—to meet the demand. Recognizing this "economic and education imperative" (Alstadt, Fingerhut, and Kazis, 2012, p. 1), legislatures across the United States increasingly are pursuing policy initiatives with the aim of incentivizing colleges and universities to increase its share of graduates. Within the realm of higher education financing, this is commonly referred to as outcomes-based funding (OBF) or outcomes-based budgeting. Regardless of the nomenclature, research analyzing the impacts of OBF has indicated that policy tools such as OBF are not achieving the goals they set out to do. However, the previous research was limited in scope in that it was primarily qualitative in nature, focused on states that were early adopters of OBF, and focused almost exclusively on universities. To help inform policy discussions, this research project aimed to fill in some of the gaps in the existing literature by examining whether states that implement an outcomes-based funding model experience a statistically significant increase in student success indicators by aggregating community college student success data within each state. To this end, this chapter presents a summary of this study, a summary of the statistical findings for each of the two research questions, study limitations, areas for future research, and implications for practice.

Summary of Study

Given the increasingly strong focus on accountability within higher education, especially as it manifests itself in funding models, the purpose of this study was to examine whether states

that implement outcomes-based funding experience a statistically significant increase in student success indicators by aggregating community college student success data within each state. The two primary research questions supporting this study's focus were:

1. What are the differences over time in community college student *retention* for states with outcomes-based funding model?
2. What are the differences over time in community college student *graduation rates* for states with outcomes-based funding model?

Two theoretical foundations guided this study. First, resource dependency theory postulates that organizations will shift policies and practices in response to external pressures, especially if those external pressures are tied to resource allocation. If this theory holds true as applied this study, it assumes that institutions will change policies and practices to meet state-level student success metrics, which in turn leads to greater access to state-level funding allocations. This theory underlies the foundations for the researcher's hypothesis that outcomes-based funding has a positive impact on retention and graduation rates, the two independent variables used in this study. The second theory—advocacy coalition framework—indicates that to truly measure the effect of policy decisions on organizations, one must study the impact of that policy change over time, going so far as to set 10 years as the minimum study period. Recognizing that complex organizations such as colleges and universities often need time in which to shift policies and practices in support of new directives, this theory most strongly influenced the longitudinal approach to this study. To this end, and because of limitations of data availability, this study included those states that implemented outcomes-based funding in

2005 and measured graduation rates three years prior and seven years after, which allowed for a 10 year measurement time period. As a result of this focus, states studied were Arkansas, Indiana, New Mexico, Texas, and Washington.

In light of the limited quantitative studies on outcomes-based funding and the researcher's philosophical learnings towards objectivism and positivism, this study employed a quantitative analysis. This examination included a two-part statistical analysis of the research questions. First, the researcher ran a p-hat test to determine whether, over time, if changes in retention or graduation rates were statistically significant. The second prong of this analysis was a binary regression for dependent variables that experienced statistically significant difference. This approach allowed the researcher to control for factors known to influence retention or graduation rates; these included state operating grants, unemployment rates, minority student enrollment, and percent of funds budgeted towards instructional expenses; these factors served as dependent variables for this study. It is important to note that the regression analysis required the researcher to transform variables into categorical variables; details of this are provided in chapter four.

Review of Statistical Findings

As discussed previously, the researcher's primary interest was whether retention and graduation rates increased after implementation of outcomes-based funding (OBF). While the metrics associated with OBF are numerous, retention and graduation represent the most common metrics upon which states are assessed under an OBF model. The first variable assessed—retention—yielded three states in which experienced a statistically significant change: Texas and

Washington (positive change) and Arkansas (negative change). While both Indiana and New Mexico saw changes in the percent of students retained between 2004-05 and 2013-14, neither of these changes were found to be statistically significant. When controlling for the independent variables, results indicated that outcomes-based funding did not yield statistically significant results ($p > .95$) for retention rates.

The second research question focused on whether graduation rates changed over time. Unlike retention rates, only one state—Texas—experienced a statistically significant change in graduation rates. However, counter to the researcher's hypothesis, this change was actually negative, with graduation rates declining during the study's time period. Arkansas, New Mexico and Washington experienced relatively flat changes, but not enough to demonstrate significance, while Indiana's graduation rate stayed the same. Given the lack of statistical significance, the researcher had no cause to conduct a second-tier statistical test.

Data Findings: Discussion

When this study first began, it set out to fill in voids within the existing research—in some cases, it was successful, while in others, it was met with challenges. In terms of successes, this study focused on community colleges—something nearly void in existing research. Additionally, it reviewed implications of outcomes-based funding from a quantitative perspective and did so over time—again, something not prevalent in the research. However, given the amount of attention to accountability and outcomes-based funding in higher education circles, one surprise encountered during this study was how frequently states abandoned or never implemented OBF, despite legislative directive. As such, the researcher's hoped-for large-scale national review of OBF was not possible.

Policymakers and other stakeholders are increasingly focusing their time, research, and fiscal resources on student completion. From the Gates' Foundation Completion by Design, the Lumina Foundation's Complete College America, President Obama's American Graduation Initiative, or the myriad of states funding policies, one could easily assume that institutions are quickly changing policies and practices to align with these initiatives as a means of attracting additional fiscal resources. While this study did not examine shifts in policy and practice, it did measure shifts in outcomes that align with OBF. Given such attention, the findings from this analysis were somewhat surprising in that only three states experienced changes in retention rates to any significant level—and one of those states change was an actual *negative* change. Moreover, only one state experienced a change in graduation rates to a significant level—and again, the change was a *decline* in graduation rates; this finding aligns with recent findings from Tandberg, Hillman, and Barakat's (2014) study in which the effect of OBF on two-year community college completion rates was not found to be significant and by year eight of the study, impacts were actually negative. Despite the fiscal incentive behind OBF models, findings from this and other studies indicate that OBF has little impact on achieving state-level educational goals; in some cases, it may negatively affect such goals. Regardless, these findings counter the researcher's hypothesis that outcomes-based funding would have a statistically significant increase in student success metrics.

Despite these observations, the researcher is left with several questions, many of which are rooted in findings from the literature review. If the tenets of resource dependency theory (RDT) hold true, did institutions collectively not make wholesale changes in order to maximize

state resources? Or, was the actual level of resource tied to performance not significant enough to incentivize change? Questions aside, RDT is typically a model deployed in the private, for-profit sector. Despite originating nearly 40 years ago, current research continually asserts that for-profit organizations are intrinsically motivated to increase their bottom line and therefore, allow external forces to drive internal operations (Hillman, Withers, & Collins, 2016). However, the operations affected include mergers and acquisitions, business ventures, corporate boards of directors, and executive succession--factors typically not at play within higher education. This leaves the researcher questioning whether RDT is an appropriate theory to guide OBF work as institutions of higher education, especially community colleges, have a vastly different mission and motivation than do its corporate partners. Several studies reinforced this concept through an analysis RDT's role in nonprofit settings (Froelich, 1999; Hodge & Piccolo, 2005; Miller-Millesen, 2003). As just one example, Hodge and Piccolo (2005) asserted that RDT has greater application within the nonprofit world if the primary resource base is from private sources; if resources are driven by government agencies, then the application of RDT as a driving factor is diminished. Regardless, it is important not to set aside RDT as a guiding principle behind OBF research just yet; instead, further development of OBF models and increased allocation of funding to these models may shift RDT's application within a non-corporate setting.

Additionally, the advocacy coalition framework indicates that policies must be in place for a *minimum* of 10 years and that policies are a means for conveying beliefs, principles or values. Given these foundations, the researcher is left wondering if the time period of this study was simply not long enough to recognize the complexity of community colleges who may need

more time in which to make significant change—and embrace the values of associated with OBF. Moreover, if legislators value goals such as retention and completion, but the comprehensive community college mission values a direction more expansive than this (e.g., adult basic education, early-college programs), then do the two values systems collide, preventing any wholesale change? This assertion is of significant concern for this researcher in that it questions who sets the mission of community colleges within each state and presents a situation in which funding and values are inherently at odds. Such conclusions reinforce many of the assertions provided in the American Association of Community Colleges 2012 report on the future of America's community colleges. While AACC's recommendations in this report are bold, they too, question the historical mission of the community college.

Interestingly, the findings from this study parallel those of other studies analyzing outcomes-based funding in that the model does not achieve the outcomes it set out to accomplish (Dougherty & Natow, 2009; Dougherty, Natow, & Vega, 2012; Sanford, 2011; Shin, 2009; Shin & Milton, 2004). However, one could posit that the findings parallel Dougherty and Reddy's (2011) study that found that implementation of outcomes-based funding caused immediate (e.g., increased awareness of institutional performance) and intermediate (e.g., changes to academic and student services policies, programs, and practices) changes, but did not result in achievement of long-term outcomes (increased graduation rates). If one theorizes that short-term or intermediate changes include retention, one could conclude that the positive change in retention rates found in two states could be viewed as a short-term gain, but graduation rates as a long-term impact were not realized.

In light of this study's findings, it is important to recognize the evolution of OBF models. As discussed in chapter one, early performance funding models typically limited metrics to completion and only funded OBF if additional state funding existed or as funding in addition to the base allocation; such models were termed "performance funding 1.0" (Dougherty & Reddy, 2011). Over time, such models evolved to fund a wider range of metrics and incorporated funding into the base model; Dougherty and Reddy (2013) termed such models "performance-funding 2.0". As more states adopt OBF models, policymakers are involving institutional leadership in the development, expanding the types of metrics used, and significantly increasing the funding levels dedicated to OBF. Given this recent shift, this researcher posits that a new OBF model is emerging and may be termed "performance funding 3.0". Once established, such models are worthy of future research not only to determine a correlation between funding and increased performance but potentially to find greater ties to resource dependency theory as a driving force behind such performance.

Implications for Practice

According to an analysis by the Center on Budget and Policy Priorities (Mitchell, Palacios, & Leachman, 2014), 48 states are spending less per student than they did prior to the 2007 recession, with 46 of these cutting per-student funding by 20% or more. Given declining funding and early evidence that indicates that outcomes-based funding models do not achieve their intended goals, it may be tempting for policymakers to abandon these models. Yet with limited research on which type of model and strategies are most effective, the results of this study should only serve as a "cautionary note" (Tandberg, Hillman, & Barakat, 2014, p. 27).

Instead, legislators and higher education policymakers may wish to further analyze funding levels, funding model elements, state strategies, and institutional practices that contribute to greater retention and completion rates and consider sustaining models until such programs yield more conclusive, long-term results. Moreover, it would be wise for policymakers to consider the mission of community colleges within their states. For example, if an individual state's community colleges are comprehensive in nature—that is, they offer transfer and career and technical education courses, adult basic skills, high school dual enrollment, community learning and the like—then the metrics by which these community colleges are funded should be vastly different than states whose community college solely focus on workforce education. Working together—as advised by Friedel, et al (2013), Harnisch (2001), and Jones (2013), among others—they may then develop a model that makes a significant difference in achievement key performance indicators. Simply put, this researchers posits that if policymakers are to use this and accompanying research to drive OBF decision making, then they would be wise to involve key stakeholders, include metrics that recognize the broad mission of community colleges, consider appropriate levels of funding, recognize the complexities associated with serving underrepresented populations, and provide sufficient time for institutions to respond to such changes.

Existing research indicates that Tennessee aside, most states dedicated between 0.5% and 7.0% to outcomes-based funding or outcomes-based budgeting; it is only in recent years that states have started increasing these allocations to what some may see as a more meaningful proportion. In light of OBF playing a significant role in allocation of state dollars to individual

institutions, institutions may not have enough incentive currently to redesign policies and practices in line with state educational goals. While this certainly highlights future research possibilities, it also serves as a key question for legislators and higher education leaders as they work, hopefully in concert with each other, to design or redesign existing models.

It is well documented that community colleges first emerged with the purpose of preparing students not yet qualified for admission to a baccalaureate institution. Shortly thereafter, this was broadened to include a focus on workforce training (Cohen & Brawer, 2008; Desai, 2012; Mullin, 2010; Thelin, 2011). Over time, the community college mission expanded to include high school completion, English as a second language programs (Mullin, 2010), community education (Cohen & Brawer, 2008), dual enrollment programs (Mullin, 2010; Struhl & Vargas, 2012), bachelor degrees (Kahlenberg, 2011; Mullin, 2010) and college access programs (Harvill, et al., 2012). If this "all things to all people" (González, 2012b, p. 1) approach is to be sustainable, then funding models must follow suit. However, with a majority of community college OBF models focusing primarily on certificate or degree-seeking students, they inherently ignore the comprehensive community college mission. As such, the goals of legislators, institutions, and in some cases, communities, may be inherently at odds. Whether OBF models should recognize the comprehensive mission of the community college or if community colleges should begin a shift in their mission is perhaps the most challenging question facing policymakers and community college leaders engaged in OBF policy development.

Research Limitations

More fully discussed in chapter three, this study's data set comes with limitations. First, IPEDS graduation rates only include first-time, full-time, and degree-seeking students. While this definition somewhat aligns with the goals of OBF models in its focus on degree-seeking students, it does not align with the typical community college student as it ignores transfer and part-time students, who represent a large portion of community college enrollments. Additionally, IPEDS did not collect graduation rates until 1997 and retention rates until 2003. As such, this limits a researcher's ability to view changes over a longer period; under the advocacy coalition framework, a longer-term view may yield different results. Regardless, for lack of another nationwide data set, IPEDS serves as the foundation for many similar OBF (and other high education) studies, thereby providing a reasonably strong comparator.

As open-door institutions, community colleges oftentimes do not participate in data sets such as the Cooperative Institutional Research Program (CIRP) at the Higher Education Research Institute at the University of California – Los Angeles. Such surveys provide researchers with access to data that would be of great benefit to studies similar to the one presented in this paper; however, community colleges are not active participants and as such, including other control variables known to impact students success (e.g., first generation students, academic preparation) was not possible. Moreover, individual community colleges typically do not collect similar data, and that lack of data limits the ability to test the myriad of variables impacting student retention and completion.

It is important to discuss the level of funding—or lack thereof—dedicated to OBF in the states examined in this study. Historically, states engaged with outcomes-based funding dedicated a limited amount of funds towards outcomes. The five states included in this study followed suit, with Arkansas starting its OBF model by dedicating 5% of state allocations to performance, Indiana at 6%, and New Mexico at 3.5%, with Washington allocating a fixed amount ($5 million or approximately 1%), and Texas adopting an incentive fund above and beyond its base allocation. This lower level of funding for OBF in and of itself may not be enough to incentivize community colleges to make wholesale changes and as such, significant change in graduation and retention rates may not occur.

Finally, it is important to examine the limitations of the statistical model. A major limitation of all regression tests is that a researcher can only establish whether a relationship exists; exact causality is not possible. While it controls for specific variables, it is limited in its ability to provide broad-based predictive guidance. Additionally, the longitudinal approach of this study might produce results which regress towards the mean over time as opposed to showing significance when comparing one point in time to the other. Given this, results of this study should only be used in concert with existing and future studies before broad-based assumptions are drawn.

Areas for Future Research

Compared to many topics within higher education, research on OBF is limited in its depth, especially as it pertains to longitudinal, statistically driven research. Therefore, at the most simplistic level, an area for future research simply must include more studies, albeit

repetition of existing studies over longer periods of time or new studies that stand on their own design. Such work will contribute to a more robust research pool and perhaps allows researchers, policymakers, and higher education leaders to make stronger data-driven decisions. The availability of "more data" aside, this research exercise yielded several additional questions—and areas for future focus—for this researcher.

In particular, a study that might yield interesting results would be a focus on states that have recently increased (or plan to do so in the near future) the percent of funds dedicated to OBF. Do such states have better success meeting the intended outcomes of such models, albeit with a point-in-time or longitudinal view? How do they contrast to states with smaller allocations? Is there a "sweet spot" in terms of dollar allocations that make a statistically significant difference in achievement of outcomes? Additionally, as more states adopt and sustain OBF models, it will be important not only to study whether the funding models achieve their intended outcomes but also what characteristics of those funding models are associated with the greatest success. This type of research may also help inform practitioners as it can then drill down to more strongly identify policies, practices or other variables that yield positive results.

While this study included several states, an additional area for future research consideration is to do a more in-depth analysis of each individual state. This could include an institution-to-institution comparison within each state, allowing the researcher to quantitatively determine if specific institutions experience a statistically significant change, followed by a qualitative analysis of the differences in institutional policies and practices influencing retention and graduation. Moreover, it may be worthy to conduct state-specific studies to determine if

performance on metrics other than retention and completion change as a result of outcomes-based funding. The inability to include a wider range of independent variables leads to questions of a type II error. In other words, could other factors have affected the lack of statistical significance found in this study? For example, one could drill down within each state to examine why Indiana's graduation and retention rates are far lower than other states in this study or why Arkansas's graduation rate was statistically significant, but the change was actually negative. Ultimately, this leads to significant areas for future research: What other independent variables might affect outcomes or are there other uncontrollable, external factors influencing retention and graduation rates? Finally, state-specific studies may allow for different quantitative methodologies, including selection of sample and statistical tests, thereby deepening the volume of OBF quantitative research.

Conclusion

Outcomes-based funding as a U.S. higher education funding model has ebbed and flowed since Tennessee first introduced it in 1979. In recent years, however, it has not only become a more prevalent model, but the percent of funds allocated towards outcomes achievement is growing. Given this attention, and the amount of time institutions invest in shifting policies, systems, and practices to better align with state achievement goals, it is imperative that policymakers and higher education leaders move towards models that produce intended results. Unfortunately, existing research has yet to point to effective OBF design; the findings of this study, while counter to the researcher's hypothesis that introduction of outcomes-based funding does have a statistically significant impact on community college retention and graduation rates,

follow suit. The results from three states indicate that changes in retention rates were statistically significant, although only two of those states experienced a positive change. Moreover, the positive change did not yield long-term increases in graduation rates, indicating that OBF may not be an effective state-level policy tool to developing a more skilled and educated workforce. As stated previously, however, results from this study need to be taken in concert with findings from past and future research and be recognized as a contributor to an early and emerging body of research.

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APPENDICES

Appendix A: Dependent Variable Data

State	Variable	2004-05	2013-14
Arkansas	Part-time student retention (%)	43.05	36.86
	Full-time student retention (%)	55.59	52.45
	Weighted average, retention (%)	52.11	48.96
	Graduation (%)	23.82	22.18
	Headcount (degree-seeking only)	37,337	44,072
	Total headcount (degree-seeking and first time, fall only)	8,726	9,814
	Part-time headcount (degree-seeking and first time)	2,419	2,194
	Full-time headcount (degree-seeking and first time)	6,307	7,620
Indiana	Part-time student retention (%)	46.00	49.00
	Full-time student retention (%)	44.00	39.00
	Weighted average, retention (%)	44.80	43.90
	Graduation (%)	9.00	9.0
	Headcount (degree-seeking only)	9,182	87,017
	Total headcount (degree-seeking and first time, fall only)	1,451	16,181
	Part-time headcount (degree-seeking and first time)	621	8,013
	Full-time headcount (degree-seeking and first time)	830	8,051
New Mexico	Part-time student retention (%)	34.22	31.61
	Full-time student retention (%)	51.21	52.37
	Weighted average, retention (%)	45.47	46.17
	Graduation (%)	13.47	14.00
	Headcount (degree-seeking only)	46,277	58,895
	Total headcount (degree-seeking and first time, fall only)	8,425	10,662
	Part-time headcount (degree-seeking and first time)	2,846	3,186
	Full-time headcount (degree-seeking and first time)	5,579	7,476
Texas	Part-time student retention (%)	52.73	53.95
	Full-time student retention (%)	37.71	43.41

	Weighted average, retention (%)	55.69	57.58
	Graduation (%)	17.70	16.33
	Headcount (degree-seeking only)	474,146	60,5017
	Total headcount (degree-seeking and first time, fall only)	107,643	122,885
	Part-time headcount (degree-seeking and first time)	54,862	57,675
	Full-time headcount (degree-seeking and first time)	52,782	65,210
Washington	Part-time student retention (%)	43.8	46.64
	Full-time student retention (%)	60.28	60.84
	Weighted average, retention (%)	55.69	57.58
	Graduation (%)	32.56	31.56
	Headcount (degree-seeking only)	65,279	80,079
	Total headcount (degree-seeking and first time, fall only)	13,479	12,324
	Part-time headcount (degree-seeking and first time)	3,756	2,828
	Full-time headcount (degree-seeking and first time)	9,723	9,496

Appendix B: Independent Variable Data

State Operating Funds (%)	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Arkansas	48.1	46.1	48	47	49.2	45.7	41	37.7	38	39.1
Indiana	50	43.1	40.9	32.3	40.3	34.1	26.7	8.8	36.2	36.3
New Mexico	98.8	5.1	68.9	47.3	13.2	14.3	13.4	12.7	12.5	97.7
Texas	32.4	34.6	36.4	35.5	35.5	42.7	1226	1159	1088	9904
Washington	44	44	48.2	48.1	49.4	49.4	43.6	40.8	37.3	36.5
National Average	34.9	35.7	36.5	37.2	37.6	34.5	30.0	28.6	27.0	26.6

Unemployment Rates (%)	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Arkansas	5.7	5.2	5.2	5.3	5.5	7.8	8.2	8.3	7.6	7.4
Indiana	5.2	5.4	5.1	4.6	5.9	10.3	10.4	9.1	8.3	7.7
New Mexico	5.7	5	4.1	3.9	4.5	7.5	8.1	7.6	7.1	6.9
Texas	6.1	5.3	4.8	4.3	4.8	7.6	8.1	7.8	6.7	6.2
Washington	6.2	5.5	5	4.7	5.4	9.2	10	9.2	8.1	7
National Average	5.5	5.1	4.6	4.6	5.8	9.3	9.6	8.9	8.1	7.4

Minority Student Enrollment (%)	Fall 2004	Fall 2005	Fall 2006	Fall 2007	Fall 2008	Fall 2009	Fall 2010	Fall 2011	Fall 2012	Fall 2013
Arkansas	24.3	24.7	25.6	25.7	30.5	27	30.5	33.7	33.9	32.8
Indiana	22.70	24.90	27.30	24.90	29.90	31.30	38.40	38.90	27.40	26.70
New Mexico	60.40	61.30	62.90	62.80	62.20	63.50	62.90	65.60	69.30	68.40

Texas	44.70	44.90	47.00	49.20	52.50	54.60	56.10	59.60	64.50	61.20
Washington	15.30	15.40	16.60	16.00	17.60	17.70	26.70	27.80	29.30	29.60
National Average	34	34.6	36.1	36.9	38.6	37.6	42.6	45.2	46.1	47.7

Budgeted Instructional Expenses (%)	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Arkansas	34.5	35.5	35.9	37.0	33.2	32.5	36.7	37.1	39.6	39.8
Indiana	35.9	40.0	38.1	57.7	34.5	42.2	41.8	40.2	37.5	37.8
New Mexico	34.0	33.0	30.4	31.4	33.7	36.2	34.3	34.8	37.3	37.3
Texas	39.2	38.3	38.9	36.1	35.9	36.2	41.1	41.3	40.4	41.7
Washington	37.9	39.1	38.4	36.1	37.9	37.3	41.0	44.2	44.4	40.7
National Average	37.4	37.3	37.3	36.6	37.3	37.7	39.8	39.7	41.1	42.2

Appendix C: Transformed Variable Details

State Operating Grants	Number of Years Above National Average	Transformed Variable
Arkansas	10	1
Indiana	6	1
New Mexico	10	1
Texas	5	0
Washington	10	1

Unemployment Rates	Number of Years Above National Average	Transformed Variable
Arkansas	4	0
Indiana	8	1
New Mexico	1	0
Texas	3	0
Washington	6	1

Minority Student Enrollment	Number of Years Above National Average	Transformed Variable
Arkansas	0	0
Indiana	0	0
New Mexico	10	1
Texas	10	1
Washington	0	0

Budgeted Instructional Expenses	Number of Years Above National Average	Transformed Variable
Arkansas	0	0
Indiana	6	1
New Mexico	0	0
Texas	5	0
Washington	7	1