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Annual Financial Performance, Efficiency, and Quality of Care in Accountable Care Organizations in Florida and Texas

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This is to certify that the doctoral study by

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Abstract

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Tony White

MBA, Strayer University, 2016

BSBM, University of Phoenix, 2004

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

The association between efficiency and quality of care among accountable care organizations is not fully understood. Therefore, the purpose of this quantitative study was to examine the relationships between ACO efficiency, ACO financial performance, and ACO quality scores in the states of Florida and Texas. Guided by structural contingency theory, the research questions explored whether there was a statistically significant relationship between ACO efficiency and financial performance, as well as ACO efficiency and the quality of care among ACOs in the states of Texas and Florida in 2018 using all ACOs located in those states. The results of the study concluded that there was a statistically significant relationship between ACO efficiency and financial performance, and no relationship between ACO efficiency and ACO quality in ACOs in the states of Texas and Florida when controlling for shared savings plan, the investment model, the advanced payment model, total inpatient expenditures, total outpatient expenditures, Texas, and Florida (time in program was not available in the dataset). It is recommended that ACOs review their current structure and continue to work on increasing their financial performance and efficiency levels together to ensure that they are continuing to be efficient during the COVID-19 pandemic. By increasing efficiency levels and financial performance, patients and their wider community can be offered more robust services within the community, promoting positive social change.

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Section 1: Foundation of the Study and Literature Review

The United States healthcare system is characterized as being guided by a fragmented healthcare model. Accountable care organizations (ACOs) are networks of doctors and hospitals that share financial and medical responsibilities to provide coordinated care to Medicare patients with the aim of reducing unnecessary spending (Scott, 2018). ACOs must demonstrate that they are providing care that has relative worth according to federally set benchmarks that measure quality and cost-efficiency (Hogle, 2018). ACOs can mostly assist Medicare patients under three specific models: The shared savings program, the advanced payment model, and the investment model (Fullerton et al., 2016). Previous research has highlighted that Medicare shared savings program ACOs can lower Medicare spending (Trombley, 2018), yet many hospital administrators report that it may be difficult for ACOs to be successful due to low population numbers, which increases a hospital's risk (Colla et al., 2016). Additionally, Palazzolo and Ozcan (2018) examined whether efficient ACOs earned shared savings. The results of their study concluded that very few ACOs in the Medicare shared savings program was efficient from data collected in 2014. The results further concluded that the more efficient ACOs were not restricted to solely achieving shared savings. However, Palazzolo and Ozcan reported that there were some limitations in their study that included minimal quality measures and recommended further research to focus on the data envelopment analysis (DEA) model for richer and more updated datasets. Therefore, the aim of this study was to determine the relationships between annual financial performance and quality composite scores of ACOs in the states of Florida and Texas, two of the top three

states for number of ACOs. After California's 58 ACOs, the state of Florida had 55 and Texas had 44 (Wilson et al., 2020).

This section will present the foundation of the study by highlighting the problem statement, the purpose of the study, the research questions and hypotheses that guided the research, as well as the theoretical framework. Additionally, this section will provide a robust overview of the literature and identify the gap in the literature that makes this study viable. This section will conclude with a discussion on the study's assumptions, scope, and delimitations, and will define terms that will be used throughout the dissertation.

Problem Statement

It was unknown how hospitals' annual financial performances were related to their quality composite scores throughout the United States. Therefore, the problem studied was that because ACOs used quality composite scores to measure pay for performance and consisted of small sets of data points that were highly related to one another, hospitals could experience increased costs and a reduction in quality of care (Nattinger et al., 2018). ACOs must demonstrate that they are providing care that has relative worth according to federally set benchmarks that measure quality and cost-efficiency (Hogle, 2018). Financial benchmarks were defined as cost targets used to measure each ACO's financial performance (McWilliams et al., 2018). In ACOs, the financial benchmark was based upon costs for the five benchmark years prior to the start of each agreement period (Rose et al., 2016). When it comes to financial benchmarks, ACOs have 5 years to work within their identified benchmarks before they are rebased;

however, if a financial benchmark is unfavorable, the ACO may have to place more resources into the areas of improved resources for care management so that it can be applied in future benchmarks (McWilliams et al., 2018).

Because the U.S. healthcare system is characterized as being guided by a fragmented healthcare model, ACOs can mostly assist Medicare patients under three specific models: the shared saving program, the advanced payment model, and the investment model (Fullerton et al., 2016). The shared savings program is voluntary and encourages doctors and hospitals and other healthcare providers to merge to provide high quality care to their Medicare patients (McWilliams et al., 2020). Alternatively, the Advance Payment Model is used as an approach to reward providers when they deliver high-quality and cost-efficient care; the investment model tends to build on the advanced payment model by encouraging new ACOs to work together, especially in rural and underserved areas, while transitioning to arrangements that promote higher than usual risk (Pugh, 2016).

ACOs use quality composite scores to measure pay for performance. Composite scores are measured by areas of patient and caregiver experiences, coordination of care and patient safety, preventative health, and working with at-risk populations (Centers for Medicare and Medicaid Services [CMS], 2018). Previous research has highlighted that Medicare shared savings program ACOs can lower Medicare spending (Trombley, 2018); yet many hospital administrators report that it may be difficult for ACOs to be successful due to low population numbers, which increases a hospital's risk (Colla et al., 2016). For example, previous research using 2014 performance data for Medicare ACOs examined

the financial performance of rural ACOs. These studies demonstrated that ACOs' financial performance and success were likely associated with factors unique to rural environments, which included that many rural areas followed a physician-based organizational type (Lin, 2016; Nattinger et al., 2018; Ship III, 2018). Additionally, Nattinger et al. (2018) reported that their study did not find any associations between an ACO's size, experience, or annual financial performance. These findings have demonstrated a hodge-podge of results that were conflicting in nature, highlighting the need for this current study.

Purpose of the Study

The purpose of this quantitative study was to examine the relationships between ACO efficiency, ACO financial performance, and ACO quality scores in Florida and Texas, two states with large Medicare populations. Additionally, I determined any relationships between financial benchmark expenditures in relation to geographical locations, shared savings models, advanced payment models, and investment models for ACOs in the United States. In this study, the financial benchmark was defined as the cost target used to measure each ACO's financial performance (McWilliams et al., 2018). In ACOs, the financial benchmark is based upon costs for the 5 benchmark years prior to the start of each agreement period (Rose et al., 2016). To address the problem in this study, the approach included a two-step process of a DEA and multiple regression. A DEA approach allowed me to determine areas of efficiency within specific inputs, whereas a multiple regression analysis allowed for the determination of relationships between one or more variables (Palazzolo & Ozcan, 2018).

ACOs need to be aware of costs and annual financial performances and the quality of their performances for exploring ways to provide care that is more efficient for all stakeholders across multiple care settings (Lewis et al., 2018). Additionally, ACOs are accountable to healthcare payers for the overall cost and quality of care for a defined population (National Conference of State Legislature (NCSL), 2018); they are a vehicle for implementing comprehensive payment reform and health care system redesign to control the growth in health care costs while obtaining increased value for each healthcare dollar (Erickson et al., 2020).

ACOs have a few goals that they must meet as worthwhile endeavors. These goals include reducing healthcare spending and sharing in cost savings, as well as meeting quality performance benchmarks aimed at improving the quality of care and patient outcomes. When ACOs use quality composite scores to measure pay for performance, measure developers utilize statistical analyses to devise a recommended scoring methodology for combining individual measures into composite scores. This ensures that composites are calculated consistently (Agency for Healthcare Research and Quality (AHRQ), 2019). Success is accomplished by meeting and improving quality performance benchmarks; therefore, hospitals and physician practices participating in ACOs need health IT tools and data analytics capabilities to determine their clinical performance (Gruessner, 2016). Measuring data effectively is key to meeting quality performance benchmarks for the nation's ACOs. Therefore, when downloading data for this study, I ensured that specific variables would be investigated: cost, quality, and financial

performance of ACOs located in the states of Florida and Texas; composite scores; and total benchmark expenditures.

Research Questions and Hypotheses

This study was guided by the following two research questions and their corresponding hypotheses:

RQ1: Is there a statistically significant relationship between ACO efficiency and ACO financial performance in ACOs in the states of Texas and Florida when controlling for shared Savings Plan, the investment model, the advanced payment model, time in program, total inpatient expenditures, and total outpatient expenditures?

H_{01}: There is not a statistically significant relationship between ACO efficiency and ACO financial performance in ACOs in the states of Texas and Florida when controlling for shared savings plan, the investment model, the advanced payment model, time in program, total inpatient expenditures, and total outpatient expenditures.

H_{a1}: There is a statistically significant relationship between ACO efficiency and ACO financial performance in ACOs in the states of Texas and Florida when controlling for shared savings plan, the investment model, the advanced payment model, time in program, total inpatient expenditures, and total outpatient expenditures.

RQ2: Is there a statistically significant relationship between ACO efficiency and ACO quality of care among ACOs in the states of Texas and Florida when controlling for

shared savings plan, the investment model, the advanced payment model, time in program, total inpatient expenditures, and total outpatient expenditures?

H_{02}: There is not a statistically significant relationship between ACO efficiency and ACO quality of care among ACOs in the states of Texas and Florida when controlling for shared savings plan, the investment model, the advanced payment model, time in program, total inpatient expenditures, and total outpatient expenditures.

H_{a2}: There is a statistically significant relationship between ACO efficiency and ACO quality of care among ACOs in the states of Texas and Florida when controlling for shared savings plan, the investment model, the advanced payment model, time in program, total inpatient expenditures, and total outpatient expenditures.

Theoretical Foundation of the Study

The theoretical framework that guided this study included that of structural contingency theory. This theoretical framework purports that there is no one specific manner to structure an organization and that organizations are more efficient when the structure of an organization is in alignment with both its tasks and environment (Pennings, 1987). For example, this theory was in alignment with the study's purpose and research questions as it supported that efficiency influences performance. When an ACO experiences efficiency, many areas of performance can be improved such as in management, productivity, quality, and profitability (Mikhailitchenko & Pforsich, 2020). Structural contingency theory is illustrated in Figure 1.

Figure 1

Structural Contingency Theory (Thomé & Sousa, 2016)

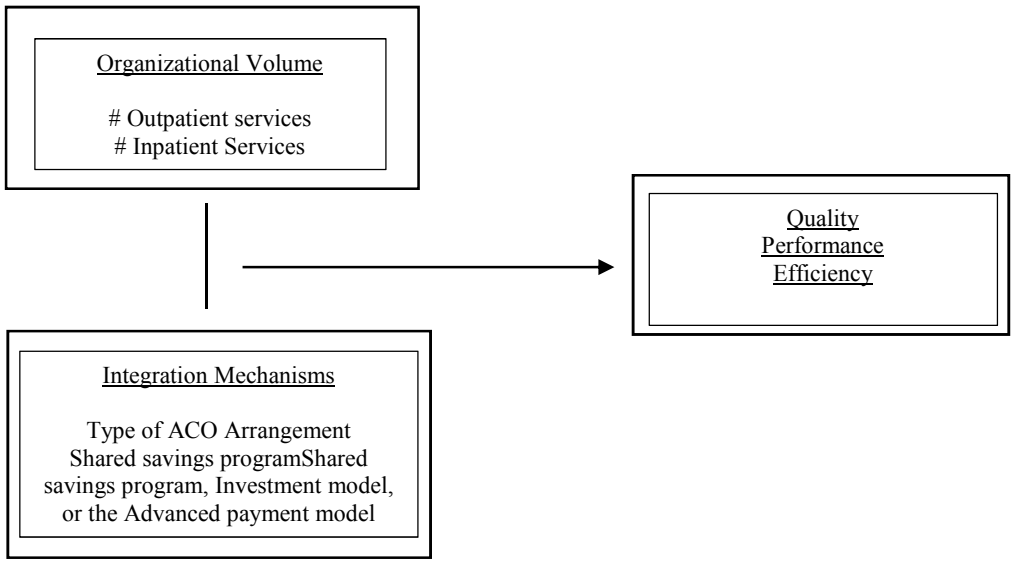


Figure 1 highlights the importance of organizational volume. Within this current study, the variables that were in alignment with organizational volume included the different elements that made up the organization (Pennings, 1987), such as the number of outpatient and inpatient services and programs and services that are offered to the community (Lewis, Fisher, & Colla, 2017). Integration mechanisms included the type of ACO arrangement, such as that of the shared savings program, the advanced payment model, or the investment model (Lewis, Tierney, Colla, & Shortell, 2017). The two constructs of organizational volume and integration mechanisms could assist in better understanding the hospital's financial performance, efficiency, and quality of care.

Developing a contingency plan is essential for all businesses and organizations to ensure that the business can operate efficiently when faced with obstacles and other difficulties. When examining the efficiency of an organization, it is important to highlight

different inputs that will be measured. Within this theoretical framework, the inputs measured in this study included expenditures per capita, the percentage of specialists (i.e., number of specialists divided by total number of medical doctors), and the inverse of the percentage of primary care physicians (PCPs) with electronic health records. The inverse of the percentages allows ACOs to understand how people who need healthcare services the least "use the services more and additionally use the services more than those individuals with a greater need" (Wright, 2009, para 2). Therefore, in this study, the inverse of the percentage was calculated by a cost-effectiveness analysis and computed as $x = n*100/ (100-\%)$. Understanding the structure and efficiency levels of the identified inputs allowed me to better understand the associated efficiency of outputs such as that of total person-years in performance attributed to the ACO, end-stage renal disease (ESRD) person-years in performance year, disabled beneficiaries, aged/dual beneficiaries, aged/non-dual beneficiaries, and earned savings (Palazzolo & Ozcan, 2018).

The structural contingency theory allowed me to examine different influences such as that of internal considerations. For example, internal factors included organizational size and the job tasks that employees were required to complete. Therefore, this theoretical framework was in alignment with this current study as it allowed me to view a minimum of four different inputs to determine efficiency by completing both a DEA in using DEAP (v.3.2.1) and a multiple regression.

Nature of the Study

This quantitative approach included both a DEA and a multiple regression analysis to address the research questions (Morrissey & Ruxton, 2018). A DEA is a

nonparametric method to determine or estimate the efficiency of decision-making units (Aldamak & Zolfaghari, 2017). I determined efficiency scores through the collected inputs using DEAP software. Therefore, when completing the DEA, I examined ACO inputs that included expenditures per capita, the percentage of specialists (i.e., number of specialists divided by total number of medical doctors), and the inverse percentage of PCPs with electronic health records. The outputs in the efficiency model were total person-years in performance attributed to the ACO, ESRD person-years in performance year, disabled beneficiaries, aged/dual beneficiaries, aged/non-dual beneficiaries, and earned savings.

Additionally, a multiple regression analysis was appropriate for this study, as the aim of regression was to explore the relationships between a dependent variable and one or more independent variables (Jeong & Jung, 2016). Once there is an understanding of the relationship between the different variables, future research could focus on comparing these variables while controlling for different factors utilizing multiple linear regression analysis. Through this methodology, data were gathered from the CMS shared savings program ACOs dataset that provided 2018 composite scores and total benchmark expenditures in relation to ACO name and state of healthcare facilities.

The sample in this study comprised 87 ACOs located in the states of Florida and Texas. The ACO inputs I studied included expenditures per capita, the percentage of specialists (i.e., number of specialist divided by total number of medical doctors), and the inverse of the percentage of PCPs with electronic health records, whereas the outputs included total person-years in performance attributed to the ACO, ESRD person-years in

performance year, disabled beneficiaries, aged/dual beneficiaries, aged/non-dual beneficiaries, and earned savings (Palazzolo & Ozcan, 2018). The unit of analysis examined was ACOs in the states of Florida and Texas. I was able to determine whether the dynamics of efficiency in ACOs in the states of Florida and Texas demonstrated a relationship between efficiency and quality when performing an analysis using the 2018 SSP dataset. The regression analysis utilized the following independent variables: (a) the shared savings plan, (b) the investment model, (c) the advanced payment model, (d) time in program, (e) efficiency scores, (f) total inpatient expenditures, and (g) total outpatient expenditures. The dependent variables for this study were quality of care and financial performance. Forthcoming conclusions should be directed towards establishing the best practices that, if adopted, could possibly present better patient outcomes in ACOs.

Literature Review Search Strategy

I gathered and evaluated peer-reviewed articles published between 2016 and 2020. The materials were sourced using the online portal of the university's library and Google Scholar, using keywords and key terms that included *accountable care organization*, *accountable care organizations AND financial performance*, *effectiveness AND accountable care organizations*, *Medicare AND ACOs*, *Medicaid AND ACOs*, *problems of ACOs*, *the success of accountable care organizations.* The literature review included peer-reviewed studies gathered from the specific bibliographic databases of EBSCOHost, Medline, ProQuest, Sage, and other professional association websites. The review covers major topics prominent in the still-nascent ACO literature: (a) the history of ACOs in the United States, (b) formats of ACO models, (c) the main features of

ACOs, (d) the quality of care offered by ACOs, (e) the financial performance of ACOs, (f) barriers faced by ACOs, (g) increasing the quality of care of ACOs, and (h) the future direction of ACOs.

Literature Review Related to Key Variables and Concepts

The History of ACOs in the United States

ACOs are provider-based networks that make use of data analytics and population health management strategies to infuse efficiency, effectiveness, and affordability into healthcare. The history of the ACO can be traced back to 2012 when it was originally established as a Medicare payment model. Throughout the years, it has become visible in private payer settings across healthcare specialization and arenas, as well as across the entire healthcare continuum (D'Aunno et al., 2018). D'Aunno et al. (2018) completed a study to better understand factors that lead to effective ACOs in the Medicare shared savings program (n = 16). The authors completed a quantitative study following explanatory sequential design and found that while it was easy to deem ACOs as simply a network of providers, they were designed to do so much more. Lewis et al. (2018) interviewed executives from 16 ACOs through semistructured questionnaires to understand ACO approaches and concluded that the ACO concept focused not only on just streamlining healthcare but optimized the quality of healthcare at reduced costs. D'Aunno et al.'s and Lewis et al.'s studies demonstrated that ACOs' objectives, apart from mainly reducing healthcare costs, included, but were not limited to, the reduction of duplication of medical services, closing gaps in care, delivering effective preventive care, and coordinating differing care services. Ultimately, ACOs are a comprehensive

approach that improves healthcare for the minimum of healthcare dollars. Even though the foundation of ACOs lies in primary care, many specialists are part of it, including hospitals, nursing homes, and other types of healthcare facilities (D'Aunno et al., 2018; Lewis et al., 2018).

Matulis and Lloyd (2018), in support of the Commonwealth Fund, conducted a comprehensive study on the history, evolution, and future of Medicaid ACOs. According to their study, forming part one of the broad changes of the health insurance market, the Affordable Care Act (2010) authorized the implementation of various healthcare delivery system reforms, the notable of which was the proposal of the ACO concept. ACOs arose from the need to meet three main aims in a simultaneous manner: (a) improve healthcare services; (b) improve patient experiences; and (c) decrease costly healthcare (Matulis & Lloyd, 2018). In the general research they carried out, Siddique and Mehta (2017) described the history of health insurance, trends in ambulatory surgery centers, and new payment models that had emerged from the Affordable Care Act (2010) and the Medicare Access and Children's Health Insurance Program Reauthorization Act (2015). The researchers concluded that there were already over 900 ACOs across the United States, and in differing markets – commercial or private, Medicare and Medicaid markets. Commercial, Medicaid, and Medicare ACOs are in fact not similar in terms of their performance. In general, it has been established that Medicaid lags Medicare and commercial ACOS when it comes to the number of beneficiaries. Moreover, according to Matulis and Lloyd, ACOs are responsible for the quality and affordable healthcare of 32 million people. As of 2017, there were already 1,336 active ACO contracts; Medicaid

ACOs only covered 12% of the beneficiaries, and the rest were covered by either Medicare ACOs or commercial ACOs (Matulis et al., 2018).

Formats of the ACO Model

Three popular formats of the ACO model include the shared savings model, the advance payment model, and the investment model (Panny et al., 2018; Yang, 2020). All formats have remarkable commonalities and differences.

Shared Savings Program

Panny et al. (2018) explored whether ACOs can meet its triple aims of improving the health of the population, improving the experience of care, and reducing the per capita cost of care as provided by the Institute for Healthcare Improvement (IHI). The authors touched on the different formats of the ACO model; the most common ACO model is the shared savings program. Better known as the Medicare shared savings program, this model is the program that led to the opportunity that created the ACO concept (Panny, et al., 2018). The shared savings program is an alternative payment program that has three main objectives: (a) it promotes accountability of providers to the patient population; (b) it aligns and matches items and services to be offered to Medicare beneficiaries; and (c) it incentivizes investment not just in high quality, but also in efficient and cost-effective healthcare services (Panny, et al., 2018). Additionally, Yang (2020) further assessed these different formats and investigated whether superiority existed among these models and determined their possible cost reductions. The researcher claimed that Medicare ACOs represented the nation's most massive initiative ever put forward in achieving value and health outcomes.

Advanced Payment Model

The advanced payment model was designed mainly for physician-based and rural providers who had merged to voluntarily provide high-quality care to Medicare patients (Panny et al., 2018; Yang, 2020). Under this model, certain participants can receive upfront and monthly payments, which they can use to make crucial investments in their care coordination infrastructure, ultimately designed to offer high quality, yet affordable care (Panny et al., 2018; Yang, 2020). Therefore, the advanced payment model is described as a voluntary program that motivates populations of physicians, hospitals, and many more other healthcare providers to work together to provide coordinated, cost-efficient, and effective care to Medicare beneficiaries (Panny et al., 2018; Yang, 2020).

Organizations can receive an advanced amount from the shared savings they have already anticipated to earn when operating under the advanced payment model. Those who are participating in this format can receive three forms of payments: (a) upfront and fixed; (b) upfront and variable; and (c) a monthly payment of the varying amount, based on the size of the ACO (Panny et al., 2018; Yang, 2020). This format of payment is structured in such a manner that acknowledges and recognizes that new ACOs are most likely to have two kids of start-up costs, fixed and variable.

Investment model

The third ACO format is the investment model. This is an initiative designed for organizations that take part in ACOs under the Medicare shared savings program. It is said to be built upon the second format, or the advanced payment model. This model utilizes prepaid shared savings so those rural and underserved areas will be encouraged to

form new ACOs; the investment model incentivizes the present Medicare shared savings program ACOs to transition to arrangements that are deemed to be so much more financially risky (Panny et al., 2018; Yang, 2020). The ACO investment model was created as a response to the worries of the stakeholder that certain providers would have insufficient or inadequate access to the capital necessary to invest in the appropriate infrastructure that could implement proper population care management (Panny et al., 2018; Yang, 2020).

Participants under the investment model of ACO can be categorized into two different groups: (a) those under the New shared savings program ACOs starting in 2015 and 2016 and (b) the ACOs that participated in the shared savings program starting in 2012, 2013, and 2014. The investment model seeks to motivate and incentivize the update of coordinated accountable care in rural geographies and areas where there was insufficient ACO activity by providing pre-payment of shared savings, whether through upfront payment or continuous payment per beneficiary per month (Panny et al., 2018; Yang, 2020). The second group covers the ACOs that participated in the shared savings program starting in 2012, 2013, and 2014. The ACO investment model assisted this group of ACOs perform well under the shared savings program, and motivated progression to higher levels of financial risk; yet higher returns in terms of better care for the beneficiaries and higher amounts of Medicare savings (Panny et al., 2018; Yang, 2020).

ACOs that began participating in the new shared savings program in 2015 or 2016 could receive three types of payments too: (a) upfront and fixed, (b) upfront and variable,

and (c) a monthly payment that depends on the size of the ACO. Usually, what the ACO receives monthly is calculated based on the number of preliminary and prospectively assigned beneficiaries of the ACO (Panny et al., 2018; Yang, 2020).

There are stringent eligibility criteria that must be met to be part of the ACO investment model. The ACO must first be accepted into and be a part of the shared savings program to be considered part of such type of payment system; the ACO's first performance period should have started between 2012 to 2016. The second criterion is accountability (Panny et al., 2018; Yang, 2020). The ACO must have comprehensively and precisely reported quality measures to the Medicare shared savings program in the most recent performance year if the ACO started in 2012, 2013, and 2014. The ACO should not have fewer than 10,000 beneficiaries for the most recent quarter, should not have included a hospital as an ACO participant, was not owned by a health plan whether in whole or in part, and was not a participant in the advanced payment model (Panny et al., 2018; Yang, 2020).

Main Features of ACOs

Healthcare spending has ballooned over the years and has become such a large problem that it climbed to the top of the nation's domestic policy agenda. According to Cutler (2018), who designed a study to understand precisely what the issue of the U.S. healthcare system was, rising healthcare costs expose two overlooked problems in the United States that must first be addressed before any trend reversal could truly be witnessed. First, healthcare spending is too high because many dollars are wasted by the individual and private sectors. Estimates have shown that the typical family in the United

States is compelled to pay for unnecessary medical expenses amounting to thousands of dollars every year. Many studies supported this, demonstrating that higher spending does not mean improved healthcare outcomes. Estimates have suggested that as high as one-half of medical costs do not lead to improved health (Cutler, 2018). Waste can be experienced in many forms—on top of which is misallocated treatments, undertreatments due to misdiagnosis, and unreasonably high prices. Secondly, the high cost of health care in the United States exposes the inadequacy of the government at various levels. The government is said to be unable to address the stagnant incomes for a large share of the population. Additionally, the government is criticized to have raised tax dollars efficiently and equitably, leading to increased health and economic disparities (Cutler, 2018).

Waste and distribution issues make the problem of rising healthcare costs so much more complex than most would think and imply that efforts to address it should indeed be prioritized by the government. Presently, the world is encumbered by healthcare costs linked to COVID-19. Jones (2020) provided statistical evidence that concluded that even before the pandemic, 2011 debt payments had grown rapidly. The United States is not exempted from this, even though the most affected were poorer countries. Consequently, Medicare spending growth is now considered the biggest driver of the federal debt (Cutler, 2018; Jones, 2020; Rother, 2017). Apart from Medicare spending, the government must deal with the pressure of Medicaid spending growth as well. Ballooning healthcare costs are not merely a public concern; in the private sector, employee healthcare costs now make up a major portion of a company's balance sheets,

thereby limiting business operations and affecting employee wages (Cutler, 2018; Jones, 2020). Rother (2017) discussed how the administration tried to stem the rising costs of healthcare and found that individuals and families face the problem of rapid insurance premium growth that far outpaces their income growth in real monetary terms. The overall effect is that of citizens who cannot afford adequate healthcare and a government that is heavily burdened to ensure public health and safety.

As healthcare spending sees no signs of declining, there is a broad recognition that government funds are unlikely to be sustainable over time. Assessment of Medicare spending arrives only at one conclusion: if Medicare spending continues to grow and be greater than the gross domestic product year by the year, over 100% increase in individual income taxes would have to be collected just to cover these expenses (Cutler, 2018; Jones, 2020; Rother, 2017). Over the years, the government has responded to rising health costs in various ways. Policy options are varied, with some focusing on the providers' side while others focused on the patients' side. Some policies were geared towards changing providers' incentives while others focused on cutting patients' incentives to balance costs. Naturally, none of these were truly desirable on either side (Cutler, 2018; Jones, 2020; Rother, 2017).

Apart from federal policy solutions, market solutions have also been recommended. Presently, there seems to be a tendency towards payment reform for physicians and hospitals as the leading solution. In recent years, there has been a general trend towards changing the way providers receive payment. Instead of the traditional fee-for-services model, there is a move towards bundled or global payments for populations

of the patients. As a result, physicians and hospitals are creating integrated provider organizations that would take on these new payment schemes or systems (Cutler, 2018; Jones, 2020; Rother, 2017).

However, as early as 2012, there were approximately 360 provider organizations that had entered contracts with the CMS as ACOs (Matulis & Lloyd, 2018). An ACO refers to a group of providers that cover both individual physicians that accept a joint or combined responsibility for healthcare spending and quality of care that a defined population of patients can incur and receive. It is considered a novel take or an extension of the staff model health maintenance organization (HMO; Matulis & Lloyd, 2018). Similarly, it has a similar feature to the patient-centered medical home model, particularly its use of a comprehensive and robust primary care nexus in coordinating patient care services. However, ACOs are a unique concept because of three main, distinctive features: (a) joint accountability of physicians and hospitals; (b) accountability is over both spending and quality and is operationalized through quality measurement as well as adequate reporting: and (c) an ACO covers the care of a population of people (Matulis & Lloyd, 2018).

De Lisle et al. (2017) conducted a survey on the ACO contract to understand what the trends at the time would show about the future of this new system. De Lisle et al. found that the primary feature of an ACO contract was that it embodied joint accountability. This meant that incentives for the providers were arranged or agreed upon at the organizational level. Both physicians and hospitals jointly shoulder the financial risks and rewards of the contract (De Lisle et al., 2017). For example, they share savings,

quality bonuses and other incentives based largely on how well the organization has performed overall, instead of the individual capacity of the physicians (De Lisle et al., 2017).

Lewis et al. (2017) claimed that at the time of their study, not much was known about new partnerships formed under the ACO model. In their study, the Lewis et al. conducted a mixed-methods study using data from the National Survey of ACOs, Medicare ACO performance data, and interviews with executive leaders across 31 ACOs. The purpose of the study was to know more about this concept–from its characteristics to its capabilities. Lewis et al. found that a majority of ACOs involved new partnerships between independent health care organizations that had remarkable care management, care coordination, and technological knowledge. This has important implications. This means that physicians across specialties as well as care settings can feel it beneficial to approach patient care collectively and will therefore be more inclined to coordinate care more effectively (Lewis et al., 2017).

Using data from the Leavitt Partners ACO database, Muhlestei et al. (2020) analyzed the ACOs over time to look at their numbers and market potential. The authors found that one additional feature was that ACO measured or considered accountability on two fronts– spending and quality of care. This meant that the care provided should be as affordable as possible but as effective too. Accountability for spending can be seen in how the organization achieve their spending targets (Muhlestei et al., 2020). When an ACO contract is drafted, the organization usually prepares a spending year for the incoming year, which considers both the historical cost trends and the possible burden of

morbidity among its patient population. If the spending totals below the target amount by at least a minimum amount, which is typically 2%, the organization can receive a specific portion from the savings (Muhlestei et al., 2020).

Navathe et al. (2018) conducted an observational study using a difference-in-difference design to compare how PAC utilization and spending among beneficiaries admitted to ACO-participating hospitals changed when they entered ACO contracts to evaluate these contracts' worth and value. The researchers concluded that if the spending went beyond the spending target set by the same minimum amount, the organization had to be prepared not to be reimbursed from any additional expenses it had incurred. This is referred to as the downside risk. If the ACO contract is one-sided, which is what most of those under the Medicaid shared savings program is, it can be observed that organizations face only shared savings but not risks (Navathe et al., 2018). If the ACO contract is two-sided, which is what most of those under the Medicare Pioneer ACO program are, the risks and savings are both shared by the organizations. In two-sided contracts, the spending target is usually labeled the global budget (Navathe et al., 2018).

Many other studies have presented another feature of ACO accountability, quality measurement and reporting. Utilizing the traditional pay-for-performance framework, organizations can earn bonus payments for several quality measures (Chukmaitov et al., 2018; De Lisle et al., 2017; Lewis et al., 2017). Chukmaitov et al. (2018) assessed the organizational and environmental characteristics associated with hospital participation in the MSSP and Pioneer ACOs. The researchers found that under the Medicare ACO programs, measures could be categorized into four groups: (a) patient and caregiver

experience, (b) care coordination and patient safety, (c) preventive health, and (d) specific success indicators for at-risk populations (Chukmaitov et al., 2018).

First, measurements under the patient and caregiver experience include patients' ratings of the doctors and their experiences at the hospital. Secondly, care coordination and patient safety can be measured through the overall readmission rates experienced by the hospitals. Thirdly, preventive health quality can be measured through the rates of influenza and pneumococcal vaccinations (Chukmaitov et al., 2018). The more people who are vaccinated, the better. Finally, specific measurements for at-risk populations refer to whether certain patient populations are experiencing improvements in their specific health conditions based on certain indicators assessed. For example, whether the hospitals or physicians have measurements for hemoglobin A1c levels of patients suffering from diabetes and whether these measurements indicate improvements in the patient outcomes (e.g., if patients with diabetes have A1c levels below 8% and patients with left ventricular systolic dysfunction have adequate levels of beta-blockers; Chukmaitov et al., 2018). Chukmaitov et al. (2018) ultimately found that MSSP ACOs may require broader organizational capabilities from participating hospitals while Pioneer ACOs may rely on specific hospital and environmental characteristics to achieve quality and spending targets. In general, regardless of the type of ACOs, accountability for quality and spending can be associated with each other. For example, some organizations may only become eligible for shared savings because they were only able to attain a certain minimum quality performance (Chukmaitov et al. 2018).

Colla and Fisher (2017) found that some organizations could witness their shared savings, as well as risk percentages, likely linked to the level of quality of the healthcare they provided. Colla and Fisher also claimed that one important feature of an ACO contract was that it had the responsibility for the care of a population of people, not just individual patients. Every year, spending and quality of healthcare are assessed based on the population attributed or assigned to the ACO. An attribution usually occurs in two methods: (a) prospective; and (b) retrospective (Colla & Fisher, 2017). The attribution is prospective if, before the start of the year, the ACO already knows who exactly the patients would be and whom they would allocate the spending on. This is usually the case for commercial ACO contracts, which cater mostly to those in the HMO population, and most of the patients have been designated a PCP at the beginning of the year. Alternatively, if beneficiaries are still assigned to organizations at the end of the contract year, such as in the Medicare ACO programs, then the patients are not yet clear from the start of the year. ACO contracts would cover the plurality of patients' medical settings at the end of the year (Colla & Fisher, 2017).

Quality of Care in ACOs

Researchers have claimed that ACOs are showing promise even though they are quite a recent phenomenon. For example, Hong et al. (2018) conducted a cross-sectional retrospective study on ACOs and found that regardless of their type, they are associated with high levels of overall quality of care and performance. However, Walker et al. (2017) conducted four case studies of private-sector ACOs, chosen mainly to achieve variation concerning the institutions' geography and organizational maturity. The

researchers interviewed a total of 68 key informants to elicit information regarding ACO implementation and found that there was a range of benefits and challenges to ACO contracts. However, since ACOs are relatively new, formal results from the majority of ACOs today are not yet available or accessible, so conclusive statements about their impact cannot be made. Hilligoss et al. (2018) conducted qualitative organizational case studies of four ACOs. The researchers interviewed a total of 89 executives, mid-level managers, and physicians to better understand the value of ACOs. The authors found that they did offer unprecedented benefits (Hilligoss et al., 2018). Even though these researchers could not establish conclusive results on whether ACOs could truly be beneficial or too costly, others claimed that naturally ACOs would have transformative effects (Song et al., 2014; Stuart et al., 2017). In literature synthesis research about ACOs in the United States, Song et al. (2014) claimed that if a new payment system is put into place that is correlated with significant changes in medical spending, then there are likely to be underlying changes in prices and quantities of care too. These are not necessarily negative. Stuart et al. (2017) conducted an early assessment of ACOs involving 1,333,534 enrollees and 42,801 service users and found that because medical spending was the outcome of prices of services and volume of services, it was only but natural or logical that interventions in medical spending were going to either affect the prices of the care or volume provided (Stuart et al., 2017).

Specifically, as researchers would show, in the Medicare program where prices are relatively standardized, a global budget contract that only affects the underlying physician fee schedule can be anticipated to only affect spending through the volume of

care provided. This is not the case in the private insurance sector (Diana et al., 2018; Rutledge et al., 2018). Diana et al. (2018) assessed the experiences of patients from 10 Medicare ACOs and found that not all hospitals would experience the same benefits and challenges. In some, an ACO contract could affect spending through both volume and prices, since changes in prices across health providers form an opportunity for savings to be experienced if care could be received through a provider that charges less or could be described as relatively cheaper (Diana et al., 2018). However, only those with prior care coordination and quality improvement experience position Medicare ACOs can achieve success in terms of patient experience (Diana et al., 2018). Rutledge et al (2018) conducted a mixed-methods study that assessed the initial achievements and challenges with ACO implementation and the impact of Medicaid ACOs on health care utilization and quality outcomes. The study demonstrated that the adoption of ACOs for Medicaid can lead to certain improvements in care. However, an ACO contract can also affect total payouts from the insurer to the provider (Rutledge et al., 2018).

ACO contract includes a range of incentives to providers that may lead to additional payments from the insurer, particularly on shared savings as well as quality bonuses (Chermew, 2018; Ganguli et al., 2020; Soper et al., 2017). Soper et al. (2017) conducted a brief on ACOs with the support of the California Health Care Foundation and showed the impact of Medicaid-managed Care Organizations (MCOs). Soper et al. showed that ACOs could have mixed results for different ACO participants. Alterations in medical spending reflect underlying physician or if not, patient behaviors. Changes in medical expenses can determine what kind of care is delivered and how much of it is

delivered by the physician to the patient. Alternatively, non-claim payments reflect how incentives in the contract are structured (Soper et al, 2017).

Non-claims payments can partly or completely offset savings gathered from medical claims; however, their significance cannot be negated (Chermew, 2018; Ganguli et al., 2020; Soper et al, 2017). Non-claims payments form an important dimension when evaluating contracts, but they cannot be combined as medical claim dollars. This is because they are different in a meaningful manner (Chermew, 2018; Ganguli et al., 2020; Soper et al, 2017). Falk (2016) studied what lessons could be learned from 2014 shared savings ACO performance and concluded that the new payment system could produce similar effects on process and outcome measures. Both measures could significantly represent quality in a more meaningful manner than other indicators. Process measures, widely used by many health plans can be treated operationally like additional items found on a fee schedule, wherein the delivery of a service can lead to proper compensation (Falk, 2016; Song, 2014).

Clinical outcome measures, including but not limited to blood pressure and cholesterol, also show so much more regarding the quality of healthcare received since they cannot simply be measured by checking off boxes. Early researchers have concluded what made the ACO model strong and beneficial, as well as what made it weak and areas of improvement (Falk, 2016; Song, 2014). According to Falk (2016) and Song (2014), the ACO model can be the most promising in slowing down spending and improving quality, even though they face significant obstacles simultaneously (Falk, 2016; Song, 2014). The researchers also found that in general, ACO contracts can induce changes in

physician behavior, which are aligned with higher medical savings (Falk, 2016; Song, 2014).

The chronic care model and evidence-based care practices can be anticipated to decrease the use of low-value services such as diagnostic tests and imaging, because ACOs systematically adopt patient-centered medical homes. These low-value services spell additional and wasteful expenses while increasing the use of high-value services. These high-value services include but are not limited to preventive care efforts, medication management, and palliative care services (McWilliams, et al., 2016). All combined capabilities are anticipated to lead to a systematic reorganization of care processes. Supporters of ACOs hypothesized that they can improve the quality of care as well as population health outcomes without high costs (McWilliams, et al., 2016). Instead, they are expected to reduce costs through reduced rates of inpatient utilization of healthcare services.

ACOs should be improving care transitions and helping prevent waste and service duplication because they are considered as care coordination strategies. Kaufman et al. (2018) conducted a systematic review that evaluated the quality of evidence regarding the successes of public and private ACOs with regards to health service use, processes, and outcomes of care. The authors found that ACOs have many anticipated benefits, merely from their features. First, ACOs are built based on having advanced health information technology (Kaufman et al., 2018); second, ACOs shift care from hospitals to low-cost settings by forming integrated clinical teams that can handle complex patient cases. These teams can provide holistic care because they are not just focused on physical

determinants of health. The teams contain experts on prevention, disease management, self-care, behavioral aspects, and determinants of health (Kaufman et al., 2018).

Financial Performance of ACOs

ACOs can transform the quality of care while making it more affordable, especially in the eyes of the patients. For providers, ACOs act as a vehicle for both payment and organizational reforms. Since ACOs bring physicians across specialties and different hospitals together under a similar contractual roof, organizations can better allocate their resources under a spending limit or target, thereby increasing efficiency (Falk, 2016; Song et al., 2014). Traditionally, policies designed to lower healthcare spending have targeted the reduction of provider fees or if not, the constraining of care volume, restricting gatekeeping, prior authorization, and utilization review. However, both cost-reducing methods have unintended consequences (Falk, 2016; Song et al., 2014). Even if Medicare fees are reduced, they are usually followed by compensatory increases in both volume and intensity of coding, thereby reducing or offsetting any desired savings significantly. Simultaneously, managed care techniques are sometimes disliked by physicians and patients alike (Falk, 2016; Song et al., 2014).

ACOs' spending targets and budgets are considered alternative approaches. Instead of trying to control prices or the volume of care directly, it seeks to control total spending. Even though the underlying fee schedule is retained for accounting, having a spending target can compel the organization and physicians to think ahead and decide which care or service is of high or low value (Falk, 2016; Song et al., 2014). Despite reducing costs as one of its most important features, fewer studies focus on how ACOs

achieve financial success compared to how ACOs improve healthcare outcomes. Nattinger et al. (2016) designed one of the limited numbers of studies that focused on the financial performance and success of ACOs. The authors measured ACO financial success as generating savings for Medicare as a percentage of benchmark expenditures and earned shared savings. The study, however, focused only on rural ACOs. The authors classified provider county locations as either rural or metropolitan-based mainly on their Urban Influence Code (Nattinger et al., 2016).

The results of Nattinger et al. (2016) study revealed that physician based rural ACOs were more effective at garnering savings for Medicare as well as earning shared savings compared to other types of rural ACOs or non-ACOs. The findings also revealed that engaging physicians through direct governance may increase the use of care management and therefore, indirectly reduces the utilization of costly settings of care (Nattinger et al., 2016). The researchers found no link between ACO financial performance and size. They also did not find any link between ACO financial performance and program experience. Since the researchers focused only on rural ACOs, these findings cannot be generalized to all ACOs. Other studies on ACOs' financial performance have shown that it is linked to the size and program experience. According to Nattinger et al. (2016), there may be factors unique only to rural areas that can affect ACO's financial success, such as their accessible provider affiliations, the nature of the healthcare market, and the sociodemographic characteristics of the providers in the rural areas.

Ouayogode et al. (2017) examined ACOs and market factors that could affect superior financial performance, particularly of Medicare ACO programs. The authors gathered financial performance data from the CMS and then also gathered observations of market-level characteristics through Medicare claims. The authors also collected ACO characteristics using the National Survey of ACOs for a total of 215 ACOs. The authors used these data to assess the link between ACO financial performance and a range of factors, particularly that of ACO provider composition, leadership structure, beneficiary characteristics, risk-bearing experience, quality and process improvement capabilities, physician performance management, market competition, CMS-assigned financial benchmark, and ACO contract start date (Ouayogode et al., 2017). Ouayogode et al. mainly examined two indicators: (1) the savings per Medicare beneficiary; and (2) earned shared savings payments, to determine if the Medicare ACOs performed financially well. Results of the study concluded that Medicare ACOs performing financially well were those with a greater proportion of primary care providers in the ACO as well as more practicing physicians on the governing board. Simultaneously, those with better financial performance in terms of higher savings and larger shared savings payments, also had improved physician leadership structure, active management in lessening hospital re-admission rates, and a greater number of disabled Medicare beneficiaries assigned towards an ACO (Ouayogode et al., 2017). Additionally, higher financial performance was linked to higher financial incentives offered to physicians, a more massive financial benchmark, and greater market penetration of the ACO. Results of the study showed no significant relationships between characteristics of the organizational structure with

financial performance, either on the savings per beneficiary and chances of earning shared savings. Conversely, the researchers found a significant relationship between ACO prior experience with risk-bearing contracts and financial performance (Ouayogode et al., 2017). ACOs that have previous experiences with handling or managing risk-bearing contracts can have higher savings and increased chances of earning shared savings payments. Ouayogode et al (2017) also found certain attributes of the financial performance of the ACOs in their first year. In this initial year, financial performance was found to be quite heterogeneous. However, findings revealed that the organizational structure did not consistently predict performance. Instead, the organizations with already massive financial benchmarks at baseline had better chances of achieving savings. Overall findings led the researchers to conclude that ACOs could learn over time to perform financially well under risk-bearing contracts. Ouayogode et al. (2017) also asserted that because they found organizational characteristics not to have predictive power, diversity in organizational structures for ACO participants should be encouraged. Moreover, alternative funding, as well as risk-bearing mechanisms, should be put into place so that more types of organizations can participate.

Aoun (2018) claimed that the financial performance of Medicare ACOs, in general, had varied considerably. Some ACOs were able to achieve multi-million-dollar savings, while others had incurred higher expenses leading them to report financial statement losses. The traditional view is that ACOs that had a higher number of beneficiaries were likely to save and earn more, thereby performing financially better. In their study, Aoun assessed if financial performance and the size of the beneficiary were

indeed significantly related to each other. A correlational analysis revealed that contrary to the traditional or conventional view, there was no strong correlation between financial performance and size. The benefits derived from economies of scale, that is from spreading administrative costs across a larger population, did not truly apply for Medicare ACOs. However, the findings did not discredit the importance of having a larger number of beneficiaries. Although large ACOs may not be more likely to achieve higher financial performance compared to smaller ACOs, they can still improve their prediction of healthcare costs, which can help them plan their expenses more efficiently and effectively (Aoun, 2018).

The 2017 ACO financial results showed that ACOs were able to save the Medicare program for over a billion dollars, but researchers deemed this amount minimal because they anticipated it to be so much larger (Aoun, 2018). The billion-dollar savings meant that the ACO model truly could serve as an effective cost control tool and should therefore be used in other health insurance programs such as Medicaid and employer group insurance. However, Aoun claimed that the findings were not as optimistic as they appeared, because the savings were 40% lower than their benchmarks. Instead of the size of the beneficiary, quality and cost performance are better linked with higher levels of diversity (Comfort et al, 2018). Comfort et al. (2018) examined whether an empirically derived taxonomy of ACOs could lead to improved quality and financial performance. Gathering data from three waves of the National Survey of ACOs, the researchers compared how three ACO types were able to save healthcare costs and offer improved quality care, which was physician-led ACOs, integrated ACOs, and hybrid ACOs.

Results concluded that ACOs that had diverse structures performed financially better and provided higher quality services. This conclusion was derived from the findings that revealed greater heterogeneity within ACO types than between ACO types. Simultaneously, there was evidence that demonstrated a higher level of spending on physician services for physician led ACOs (Comfort et al., 2018).

One recent study completed by Berkson et al. (2018) showed that higher savings could be achieved by ACOs with higher baseline expenditures. In the United States, Medicare's flagship ACP program, or the Medicare shared savings program, was closely monitored on how it could truly improve healthcare quality while decreasing healthcare costs, or at minimum, increase healthcare savings. In its first year alone, several measures were already assessed to reveal its financial and quality performance. Berkson et al. gathered 2013 data for 220 participating ACOs to determine key factors linked to the ACOs' ability to generate savings. Results revealed that ACOs with higher baseline expenditures were significantly more able to achieve savings than lower-cost ACOs. In addition, average quality scores for ACOs that successfully reported on quality remained relatively similar for both the organizations that did and did not generate savings.

Barriers to Success for ACOs

Despite showing promise, the ACO model has demonstrated weaknesses. Since the ACO model is still considered in its nascent stages, features that needed improvement are still many. The ACO paradigm also faces several challenges in truly achieving its expected quality and financial performance. According to Berkson et al. (2020), these weaknesses can be attributed to internal factors or inherent attributes of the model.

Alternatively, some have defended the ACO model and claimed its deficiencies to be the outcome of its environment, including the institutions and economies of the larger healthcare economy (Berkson et al., 2020). According to Blackstone and Fuhr (2016), at a contractual level, one key difficulty faced by the ACO paradigm is setting the target growth rate. If this cannot be set, it would be difficult to know if the model is delivering results. If the rate is set too low, providers are likely to feel constrained by what they can and cannot do, offer, and charge. If the rate is set too high, providers might find themselves demotivated because they would have no incentive to change their practices. In an extreme scenario, researchers discussed that if the target is set above what spending would have been in a non-ACO arrangement, the ACO contract can adversely lead to higher costs on claims spending alone (Berkson et al., 2020; Blackstone & Fuhr, 2016; Nembhard & Tucker, 2016). While financial rewards can still be experienced, such as shared savings and attaining quality bonuses, thereby offsetting the risks, they could make it more difficult for the ACO contract to truly attain net savings (Berkson et al., 2020; Blackstone & Fuhr, 2016; Nembhard & Tucker, 2016).

Nembhard and Tucker (2016) applied seven lessons from the organizational learning literature to understand inherent challenges of ACOs and how setting expectations, creating a supportive culture, and structuring improvement efforts could improve ACO outcomes. The researchers claimed that the main issue of the ACO model is the difficulty in balancing risks and rewards. If a one-sided contract could not be strong enough to lead to changes in behavior, a two-sided contract has its downsides. Two-sided contracts can be too risky, pushing providers who cannot align incentives and care to just

leave the model or exit the profession (Nembhard & Tucker, 2016). Even though the percent of shared risk to be borne by the payer and provider can be negotiated to make it equally palatable, placing the financial risk on providers in the first place is likely to raise some resistance and present key challenges. Financial risk can be quite daunting for providers, particularly if ACOs do not know ahead of time which patients they should be responsible for, such as contracts with retrospective attribution rules and enrollees in unmanaged plans. Payers can assist providers to handle their risks by sharing their spending data and being transparent about the potential areas of overuse as well as low-value care (Nembhard & Tucker, 2016).

Another critical challenge faced by ACOs is the division of risks and rewards among constituent providers. It is unclear how much hospitals should have over the shared savings and how much PCPs and specialists should have as well. It is also not clear whether each specialty should receive a similar amount among shared savings. In a two-sided ACO contract, these questions are quite salient given how global budges can alter the business model for the providers all the time. Simultaneously, revenue centers within this fee-for-service structure can become mere cost centers (Ganguli & Ferris, 2018; Hsu et al., 2017; Siddique & Mehta, 2017). Overall, organizations within the ACO model are at risk of facing many tradeoffs that they would be compelled to make. The ability of providers, regardless of what specialty they are from, to find common ground will be very critical. At the same time, providers will be called upon to exhibit leadership qualities. Even though most physicians already established themselves as leaders of the majority of ACOs at present, it remains to be seen whether the organizations would even

be capable of harmonizing the providers as tradeoffs have to be made (Ganguli & Ferris, 2018; Hsu et al., 2017; Siddique & Mehta, 2017).

Another issue raised by critics about ACOs is that patient trust is still not as established as it should be. Hilligross et al. (2017) conducted two-year qualitative case studies of four ACOs to assess the perceived risks associated with this setup. Hilligross et al. found that patients still doubt this model even though for it to ultimately work, patient buy-in is crucial. The managed care backlash of the 1990s is one evidence that patient buy-in cannot be undermined. ACOs and HMOs have similarities and patient buy-ins made HMOs successful.

Pimperl (2018) conducted a study on ACO models to determine common core principles that could affect their successful adoption. Results showed that earning patients' trust is not as straightforward a process as people think. It is not merely telling them the benefits of ACOs and expecting them to believe. It is not merely convincing hospitals and physicians to get on board so that they can convince their patients to believe in the model as well. Pimperl (2018) concluded that to earn patients' trust, ACOs should first prove their value and not just state what they can do. It is not enough to say that the quality of care under this model is going to be higher and the cost savings larger. Instead, patients must witness and experience improved preventive care, less expensive care, and an increase in holistic care at the same time. They should see actual changes in the hospitals, in that there are stronger teams of providers and more efficient transitions of care across various settings (Pimperl, 2018).

The ability of primary care medical homes to provide patient-centered care and coordinate across differing specialists will be necessary (Pimperl, 2018). Even if compared to the traditional model, ACOs may be better positioned because of risk-sharing, quality bonuses, risk adjustment, and accessibility of electronic medical records and other technological advancements, the value of patients' experiences cannot be discounted. It will become the ultimate arbiter and ruin the promise of ACOs if not attained (Pimperl, 2018).

Trosman et al. (2017) interviewed representatives from 10 private payers and six provider institutions tasked to implement the ACO model and found broader challenges that ACOs might face. Even though clinical integration is the main tenet of ACOs, policymakers still must worry that providers would consolidate their practices and expertise. This seems counterintuitive as consolidation generally reduces competition and increases prices, which is not aligned with the main objective of containing costs (Trosman et al., 2017). According to researchers across the United States, the ACO model is starting to take root, but there are unintended consequences and not just benefits to the trend. This is because it is observable that across the nation, physicians are consolidating with hospitals as well as larger health systems at increasingly rapid rates. Recent surveys have demonstrated evidence of this trend since the proportion of independent physicians had steadily fallen, reaching below 50%. This means there are now less than half of physicians willing to practice individually, highlighting that the ACO model is now deemed as more favorable and more effective. But these trends are likely to raise some concerns and induce heavier scrutiny (Trosman et al., 2017).

Increasing the number of covered lives is the predominant growth strategy of risk contracts. Simultaneously, if there are more covered lives, then ACO's bargaining power during acquisitions of specialist practices can be strengthened. As this trend continues, its effect on commercial prices will be pondered upon and investigated (Trosman et al., 2017).

Werner et al. (2018) conducted a difference-in-difference strategy and data from the Medicare shared savings program, which began in 2012, to determine whether physician practices consolidated after ACOs entered health care markets could lead to the concentration of physician practices. Werner et al. concluded that as the healthcare system moved rapidly towards an alternative payment system, the physician labor market was affected. Researchers claimed that the migration towards the ACO concept is likely to continue, despite these weaknesses and challenges. This is because benefits are still visible. In their cross-sectional study of 620 distinct ACOs, organizations in which 40% to 45% of patient visits were provided experienced significant savings (Shetty et al., 2018). As the federal government, states, and individual payers strive to move towards this direction, the pressure for physicians and hospitals to adapt to the new system and incentives around cost and quality is likely to increase further (Shetty et al., 2018).

Increasing the Quality of Care of ACOs

The review of related literature has highlighted the benefits and challenges of ACOs at this still nascent stage. From the findings of researchers, it is apparent that it remains to be seen whether ACOs can truly succeed in decreasing healthcare spending, which remains high and persists as an urgent social problem that the government is

addressing. Despite all these issues, it can be gleaned from the findings of the researchers of the ACO model that it has made an undeniably meaningful contribution to the healthcare system. First, it offers the providers a reason to transform the culture of medicine (Everson et al., 2020; Greer et al., 2020; Harrison et al., 2018). It gives the providers from varying specialties the impetus to work together and coordinate with each other so that care can be effectively delivered and not rewarded under a fee-for-service setup. Everson et al. (2020) in particular, assessed whether a hospital's participation in a Medicare ACO was associated with changes in its patterns of patient sharing with other hospitals from the early years of the ACO phenomenon. Between 2010 and 2014, because of ACOs, patient sharing across hospitals increased by 23.3%. When the researchers controlled for hospital and regional factors, they found that patient sharing increased 4.4% more at ACO hospitals compared to non-ACO hospitals ($p = .001$ for difference). The researchers concluded that if this trend continued, ACOs could provide improved care to more people. The increased sharing of patients among closely affiliated hospitals can achieve ACO quality and cost containment goals because of significant inter-organizational coordination. This undeniably made teamwork part and parcel of healthcare delivery. It asks differing organizations that usually operate in isolation with each other to stitch the separate stages of the patient's care trajectory together through cooperation and teamwork. This can have lasting implications if providers get used to working with each other for the common goal of providing high-quality patient care at more accessible costs. In the long run, some researchers claimed that this might be the most substantive legacy of the ACO model, although unlike quality care outcomes and

increased savings, this benefit is intangible (Everson et al., 2020; Greer et al., 2020; Harrison et al., 2018).

Harrison et al. (2018) gathered data from the 2015 American Hospital Association annual survey and the 2015 Medicare final rule standardizing file and assessed a total of 785 hospitals that operated under ACO in contrast to 1,446 hospitals that did not participate in the ACO phenomenon. Results concluded that the more efficient and successful of ACOs are those located in urban communities and are not-for-profit. Based on these findings, it can be concluded that under a single, collective contract at the organizational level, providers are in it together. If providers can break down silos, improve care, and manage the population's health, the ACO paradigm would be able to claim a profound achievement. Such changes, however, will take time and they are not necessarily guaranteed.

Literature Review Summary

Since 2010, approximately 900 ACOs have led to the creation of over 1,300 payment contracts involving public and private payers, which could manage the care of 10% of the overall US population (Kaufman et al., 2018). As time passes, researchers have established that there would be no stopping of ACO growth, both in terms of the number of organizations and number of contracts, because the CMS have the goal of making at least half of all their payments value based. Another reason why ACOs will continue to grow is that there is increasing support of private or commercial payments towards making payment arrangements value based.

Even though Medicare is considered the largest single payer of ACO contracts, the number of commercial ACO contracts certainly is not small. Collectively, they already represent 60% of the 32 million ACO patients across the nation; several states have implemented Medicaid ACO programs and many more are continuing to investigate it. Under the ACO model, providers from various care settings join to voluntarily assume joint responsibility for the overall costs as well as the quality of care that a defined population receives (McClellan & Saunders, 2017; Muhlestein & McClellan, 2016). Despite being of similar nature and purpose, financial performance is highly variable across ACO contracts, payer programs, and patient populations. Savings achieved by Medicare ACOs are a range of dollar savings, but nothing is fixed or stable. Among patient groups, a certain population can observe greater savings. Patients at high risk of inpatient utilization were found to observe greater servings. The savings can also be offset by the bonus payments needed to be paid to higher performing groups. ACOs are not effective across contracts; the effectiveness of an ACO still depends on its provider group characteristics such as the level of provider participation and government structure, on the IT infrastructure as well as patient population. The contract incentives can also have an impact on the contract's effectiveness.

Gaps in the Literature Review

Previous research has highlighted that Medicare shared savings program ACOs can lower Medicare spending (Trombley, 2018); yet many hospital administrators report that it may be difficult for ACOs to be successful due to low population numbers, which increases a hospital's risk (Colla et al., 2016). For example, previous research using 2014

performance data for Medicare ACOs examined the financial performance of rural ACOs. Additionally, Palazzolo and Ozan (2018) completed a study that focused on whether efficient ACOs earn shared savings. The results of the study concluded that very few ACOs in the Medicare shared savings program was efficient from data collected in 2014. The results further concluded that the more efficient ACOs were not restricted to solely achieving shared savings. The authors reported that there were some limitations in their study that included minimal quality measures and recommended further research to focus on the DEA model which richer and more updated datasets. These studies have demonstrated that ACOs' financial performances and successes were likely associated with factors unique to rural environments, which included that many rural areas followed a physician-based organizational type (Lin, 2016; Nattinger et al., 2018; Shipp, 2018). Additionally, Nattinger et al. (2018) reported that their study did not find any associations between an ACO's size, experience, or annual financial performance. These findings have demonstrated a hodge-podge of results that are conflicting in nature, highlighting the need for this current study.

Definitions

The following terms were used throughout this study; therefore, they were defined as follows:

- **Accountable care organizations.** Accountable care organizations (ACOs) are networks of doctors and hospitals that share financial and medical responsibilities to provide coordinated care to Medicare patients with the aim of reducing unnecessary spending (Scott, 2018).

- **Advanced payment model.** The advance payment model is used as an approach to reward providers when they deliver high-quality and cost-efficient care (Pugh, 2016).
- **Annual financial performance.** Annual financial performance was defined by the total net revenue by operations, the operating margin, and the total margin (Nguyen et al., 2016).
- **Earned savings attributed to the ACO.** Palazzolo and Ozcan (2018) defined earned savings as "reflecting ACOs attainment of a specified level of overall quality in order to share in the earned savings (p. 17)."
- **Efficiency.** In this study, efficiency scores were calculated by expenditures per capita, the percentage of specialists (number of specialist divided by total number of medical doctors), and the percentage of PCPs with electronic health records; the outputs will calculate the total person-years in performance attributed to the ACO, ESRD person-years in performance year, disabled beneficiaries, aged/dual beneficiaries, aged/non-dual beneficiaries, and earned savings (Palazzolo & Ozcan, 2018).
- **Financial benchmarks.** Financial benchmarks were defined as cost targets used to measure each ACO's financial performance (McWilliams et al., 2018). In ACOs, the financial benchmark is based upon costs for the five benchmark years prior to the start of each agreement period (Rose et al., 2016).

- **Integrated mechanisms.** Integration mechanisms is one of the three constructs of the structural contingency theory. Integration mechanisms can include elements of an organization that allow an interaction to occur (Pennings, 1987). These can include the type of ACO arrangement, such as that of the shared savings program, the investment model, or the advanced payment model.
- **Investment model.** The investment model tends to build on the advanced payment model by encouraging new ACOs to work together, especially in rural and underserved areas, while transitioning to arrangements that promote higher than usual risk (Pugh, 2016).
- **Organizational volume.** Organizational volume is one of the three constructs of the structural contingency theory. Organizational volume can include the number of elements that make up the organization (Pennings, 1987), such as the number of outpatient and inpatient services and programs and services that are offered to the community.
- **Quality composite scores.** Composite scores were measured by areas of patient and caregiver experiences, coordination of care and patient safety, preventative health, and working with at-risk populations (CMS, 2018).
- **Quality of care.** Quality of care was defined by the degree to which healthcare services for patients increase the likelihood of desired health outcomes (Ngantcha et al., 2017).

- **Shared savings program.** The shared savings program is voluntary and encourages doctors and hospitals and other healthcare providers to merge to provide high quality care to their Medicare patients (McWilliams et al., 2020).

Assumptions

There were some assumptions that must be discussed within this study. The first assumption was that I should remain objective by being distant and independent of what is being researched. I remained objective and independent as I ensured that I would not interfere or become a part of the research when conducting this study (Verma, 2018). This was particularly important when I was downloading data, as it was assumed that I collected data that was in alignment with the current study's problem, purpose, research questions, and methodological design. Another assumption that must be discussed was that of the study's hypotheses. It was assumed that the hypotheses would be tested in a cause-effect manner (Köksal-Tuncer & Sodian, 2018). Therefore, when completing hypotheses testing, I assumed that there was a relationship between the variables being studied, and any relationships could be tested with the analysis of the collected empirical data. A final assumption was that of the results. It was assumed that I would be able to predict, explain, and understand the phenomenon being researched.

Scope and Delimitations

There were some limitations, challenges, and barriers that must be highlighted for this study. A major limitation that needed to be addressed was that of the population being studied. Because this study examined ACOs located in the states of Florida and Texas, the results of this study may not be generalizable to other geographical areas. For

example, the results may not be generalizable to other geographical areas, simply because populations differ from region to region. Therefore, the results did not consider the natural progression within healthcare to provide quality and cost-effective care and that the results were attributing this solely to the formation of an ACO.

Significance, Summary, and Conclusions

The results of this study have the potential to be useful for positive social change and could potentially indicate whether financial incentive policies supporting ACOs need to be changed. Research plays an integral role in generating evidence that contributes to quality and cost in healthcare delivery. Likewise, information gained from these conclusions has the potential to affect health efficiency by providing evidence on how different factors, such as composite scores and total benchmark expenditures, influences the performance of ACOs. According to Burgon et al. (2018), these data could play an important role with policy makers working within ACOs, since they can use these data to develop more systematic ways of measuring and benchmarking quality of care of different providers.

Understanding how cost and quality influence financial performance has the potential to allow administrators of ACOs to understand how to reduce redundancy based on the data within claims and integrate clinical data into the system so ACOs obtain more of a holistic view of their patients. This could lead to increased quality of care while reducing healthcare costs (Wasserman et al., 2018). The rate of patients bypassing health units within their locality can suggest that an effective quality improvement infrastructure and cost reduction should be proposed for these identified areas. Conclusions derived

from this study have the potential to contribute significantly to such improvement initiatives amongst ACOs in all communities and areas, serving as a guide to policymakers, and healthcare administrators. The results of this study have the potential to influence positive social change such as increased quality of the healthcare being provided which has the potential to reflect in lower healthcare cost with prices that reflect consumer satisfaction (McWilliams et al., 2018).

Section 2: Research Design and Data Collection

The purpose of this quantitative study was to examine the relationships between ACO efficiency, ACO financial performance, and ACO quality scores in the states of Florida and Texas, two states with large Medicare populations. Additionally, I determined any relationships between financial benchmark expenditures in relation to geographical locations, shared savings models, advanced payment models, and investment models for ACOs in the United States. This section will provide a comprehensive overview of the study's research design and data collection. The section will begin with a discussion of the research design and rationale, the population, sampling and sampling procedures, and the instrumentation and the operationalization of constructs. I will conclude the section by discussing the ethical procedures that I followed for the study.

Research Design and Rationale

The purpose of this quantitative study was to examine the relationships between ACO efficiency, ACO financial performance, and ACO quality scores in the states of Florida and Texas, two states with large Medicare populations. Additionally, I determined any relationships between quality of care and financial performance in relation to geographical locations, shared savings models, advanced payment models, and investment models for ACOs in the United States. This quantitative study included both a DEA in DEAP and a multiple regression analysis (Morrissey & Ruxton, 2018). I determined efficiency scores through the collected inputs. Therefore, when completing the DEA, I examined inputs that included expenditures per capita, the percentage of

specialists (number of specialist divided by total number of medical doctors), and the percentage of PCPs with electronic health records, and then received efficiency scores for the determined outputs of the total person-years in performance attributed to the ACO, ESRD person-years in performance year, disabled beneficiaries, aged/dual beneficiaries, aged/non-dual beneficiaries, and earned savings (Palazzolo & Ozcan, 2018).

A DEA is a nonparametric method to determine or estimate the efficiency of decision-making units (Aldamak & Zolfaghari, 2017). Within DEAP, I determined efficiency scores through the collected inputs. Additionally, a multiple regression analysis was appropriate for this study, as the aim of regression was to explore the relationships between a dependent variable and one or more independent variables (Jeong & Jung, 2016). Therefore, the independent variables in the linear regression analysis included (a) the shared savings plan, (b) the investment model, (c) the advanced payment model, (d) time in program, (e) efficiency scores, (f) number of outpatient services, and (g) number of inpatient services. The dependent variable for this study was quality of care and financial performance. The following research questions guided this study:

RQ1: Is there a statistically significant relationship between ACO efficiency and ACO financial performance in ACOs in the states of Texas and Florida when controlling for shared savings plan, the investment model, the advanced payment model, time in program, total inpatient expenditures, and total outpatient expenditures?

H_{01}: There is not a statistically significant relationship between ACO efficiency and ACO financial performance in ACOs in the states of Texas and Florida when controlling for shared savings plan, the investment model, the advanced payment

model, time in program, total inpatient expenditures, and total outpatient expenditures.

H_{a1}: There is a statistically significant relationship between ACO efficiency and ACO financial performance in ACOs in the states of Texas and Florida when controlling for shared savings plan, the investment model, the advanced payment model, time in program, total inpatient expenditures, and total outpatient expenditures.

RQ2: Is there a statistically significant relationship between ACO efficiency and ACO quality of care among ACOs in the states of Texas and Florida when controlling for shared savings plan, the investment model, the advanced payment model, time in program, total inpatient expenditures, and total outpatient expenditures?

H_{02}: There is not a statistically significant relationship between ACO efficiency and ACO quality of care among ACOs in the states of Texas and Florida when controlling for shared savings plan, the investment model, the advanced payment model, time in program, total inpatient expenditures, and total outpatient expenditures.

H_{a2}: There is a statistically significant relationship between ACO efficiency and ACO quality of care among ACOs in the states of Texas and Florida when controlling for shared savings plan, the investment model, the advanced payment model, time in program, total inpatient expenditures, and total outpatient expenditures.

Methodology

In this section, I will discuss the study's methodology, including the population, the sampling and sampling procedures, and the instrumentation and operationalization of constructs. A data analysis plan will also be discussed.

Population

The target population in this study was ACOs located within the states of Florida and Texas. Data were gathered from the CMS shared savings program ACOs dataset that provided 2018 composite scores and total benchmark expenditures in relation to ACO name and state of healthcare facilities. The sample in this study comprised all ACOs located in the states of Florida and Texas.

Sampling and Sampling Procedures

I followed a purposive sampling procedure in which I downloaded all ACO data from the states of Florida and Texas. Therefore, when downloading the data, I ensured that they met the following sampling frame:

1. Each data entry included ACOs.
2. Each data entry included the states of Florida and Texas.
3. Each data entry ensured inputs that included expenditures per capita, the number of specialists and total number of medical doctors, and the inverse of the percentage of PCPs that utilize electronic health records.
4. Each data entry ensured outputs that included total person-years in performance attributed to the ACO, ESRD person-years in performance year,

disabled beneficiaries, aged/dual beneficiaries, aged/non-dual beneficiaries, and earned savings (Palazzolo & Ozcan, 2018).

5. Each data entry included 2018 data composite scores and total benchmark expenditures.

Any data that did not contain the above listed sampling frame were not used in this study.

I downloaded the relevant CMS shared savings program data from the from the CMS website (https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/sharedsavingsprogram/program-data) that had served the year 2018. I did not require any permission to collect these data as the information was in the public domain and could be downloaded freely. I used the Statistical Package for the Social Sciences (SPSS, Version 25), which provided appropriate sample sizes in relation to the study's effect, power, and error of probability to determine the appropriate sample size. Therefore, SPSS recommended a sample size of 87 hospitals, with a power of 0.8. Additionally, when completing the power analysis, I included assumptions such as *R* squared at 0.25 with eight predictors. The predictors included (a) the shared savings plan, (b) the investment model, (c) the advanced payment model, (d) time in program, (e) total inpatient expenditures, and (f) total outpatient expenditures, and (g) efficiency scores. The SPSS recommended sample size is depicted in Figure 2. Because there was a total of 99 ACOs in the states of Florida and Texas, I downloaded all records in both states.

Figure 2

SPSS Power Analysis

Power Analysis Table

	N	Actual Power[b]	Predictors: Full	Predictors: Nested	Test Assumptions: Power	Test Assumptions: Full[c]	Test Assumptions: Nested[d]	Test Assumptions: Sig.
Type III F-test[a]	87	.804	7	1	.8	.25	.18	.05

a. Intercept term is included.

b. Predictors are assumed to be fixed.

c. Squared multiple correlation coefficient in full model.

d. Squared multiple correlation coefficient in nested model.

Instrumentation and Operationalization of Constructs

I utilized secondary data for this study and therefore did not use an instrument. The secondary data were collected from the CMS shared savings program (SSP). Therefore, it was important to discuss the operationalization of the constructs, which are defined below:

Efficiency Scores

In this study, efficiency scores were calculated by the expenditures per capita, the percentage of specialists (number of specialist divided by total number of medical doctors), and the inverse of the percentage of PCPs with electronic health records; the outputs will calculate total person-years in performance attributed to the ACO, ESRD person-years in performance year, disabled beneficiaries, aged/dual beneficiaries, aged/non-dual beneficiaries, and earned savings (Palazzolo & Ozcan, 2018).

Expenditures per Capita

Expenditures per capita was operationalized by the average cost per person in relation to the different payers of health services that had been received (Palazzolo & Ozcan, 2018).

Aged/Dual Beneficiaries Attributed to the ACO

Number of assigned beneficiaries with AGED/DUAL enrollment type in benchmark year 3 adjusted for the total number of months that each beneficiary was classified as AGED/DUAL; Number of AGED/DUAL person-months divided by 12. (Palazzolo & Ozcan, 2018).

ESRD Person-Years in Performance Year

Number of assigned beneficiaries with ESRD enrollment type in the performance year adjusted for the total number of months that each beneficiary was classified as ESRD; Number of ESRD person-months divided by 12 (Palazzolo & Ozcan, 2018).

Disabled Beneficiaries Attributed to the ACO

Number of assigned beneficiaries with DISABLED enrollment type in benchmark year 3 adjusted for the total number of months that each beneficiary was classified as DISABLED; Number of DISABLED person-months divided by 12. (Palazzolo & Ozcan, 2018).

Inverse of the Percentage of PCPs With Electronic Health Records

The percentage of PCPs with electronic health records will be operationalized by the data displaying the total number of PCPS with electronic health records within the

ACO (Palazzolo & Ozcan, 2018). The inverse percentage was calculated by the following equation: $x = n*100/ (100-\%)$.

Number of Inpatient Services

In this study, inpatient visits were measured by the number of patients that were measured to an ACO on an inpatient basis (Inpatient visits= admissions/#of inpatient visits).

Number of Outpatient Services

In this study, outpatient visits were measured by the number of patients that were admitted to an ACO on an outpatient basis (Outpatient visits = admission/#of outpatient visits).

Percentage of Specialists

This input was operationalized by the total number of specialists to the total number of medical doctors within the ACO (Palazzolo & Ozcan, 2018).

Shared Savings Plan

In this study, the shared savings plan was operationalized as ACOs following three categories: (a) accountability of providers to the patient population; (b) aligning and matching items and services to be offered to Medicare beneficiaries; and (c) incentivizing in not just high quality, but that of efficient and cost-effective healthcare services (Panny et al., 2018).

Total Person-Years in Performance Year

The total person-years in performance year was operationalized as the assigned beneficiaries in the performance year adjusted downwards for beneficiaries with less than a full 12 months of eligibility; Number of person-months divided by 12.

Data Analysis Plan

When completing this study, I followed a data analysis plan. The plan included the two-step method of DEA and multiple regression. During the data analysis, I first cleaned the data. I followed specific steps when cleaning the data:

1. I reviewed the data to ensure that the inputs and all necessary variables were included in the dataset.
2. If I detected any inaccuracies, I then deleted and replaced the data.
3. If there were any missing inputs and outputs within the dataset, I then found another random data entry that acted as a replacement.
4. All data demonstrated the inputs and outputs in full. (Shan & Gubin, 2018)

After ensuring that the data were cleaned, I then completed the DEA. When completing the DEA, I placed the data into DEAP software which then calculated efficiency scores. After receiving efficiency scores, I then completed a multiple linear regression. The independent variables in the multiple linear regression analysis included: (a) the shared savings plan, (b) the investment model, (c) the advanced payment model, (d) total inpatient expenditures, and (e) total outpatient expenditures. The dependent variable for this study was quality of care and financial performance. The list of independent and dependent variables is highlighted in Table 1.

Table 1

Independent and Dependent Variables

Variables	Response category	Type of variable
Shared savings plan (IV)	0=ACO does not participate 1= ACO participates	Categorical
Investment model (IV)	0= ACO does not participate 1= ACO participates	Categorical
The advanced payment model (IV)	0= ACO does not participate 1= ACO participates	Categorical
Total inpatient expenditures (IV)	Continuous variable measured in annualized, truncated, weighted mean expenditures per assigned beneficiary person years for inpatient services for assigned beneficiaries in the performance year	Continuous
Total outpatient expenditures (IV)	Continuous variable measured in annualized, truncated, weighted mean expenditures per assigned beneficiary person years for outpatient services for assigned beneficiaries in the performance year	Continuous
Quality of care (DV)	Measured in annualized, truncated, weighted mean total expenditures per assigned beneficiary person years in the performance year	Continuous
Financial performance (DV)	Measured in annualized, truncated, weighted mean total expenditures per assigned beneficiary person years in the performance year	Continuous

Before completing the multiple regression analysis, I continuously reviewed the research questions that guided this study to ensure that the results were in alignment:

RQ1: Is there a statistically significant relationship between ACO efficiency and ACO financial performance in ACOs in the states of Texas and Florida when controlling for shared savings plan, the investment model, the advanced payment model, time in program, total inpatient expenditures, and total outpatient expenditures?

H_{01}: There is not a statistically significant relationship between ACO efficiency and ACO financial performance in ACOs in the states of Texas and Florida when controlling for shared savings plan, the investment model, the advanced payment model, time in program, total inpatient expenditures, and total outpatient expenditures.

H_{a1}: There is a statistically significant relationship between ACO efficiency and ACO financial performance in ACOs in the states of Texas and Florida when controlling for shared savings plan, the investment model, the advanced payment model, time in program, total inpatient expenditures, and total outpatient expenditures.

RQ2: Is there a statistically significant relationship between ACO efficiency and ACO quality of care among ACOs in the states of Texas and Florida when controlling for shared savings plan, the investment model, the advanced payment model, time in program, total inpatient expenditures, and total outpatient expenditures?

H_{02}: There is not a statistically significant relationship between ACO efficiency and ACO quality of care among ACOs in the states of Texas and Florida when

controlling for shared savings plan, the investment model, the advanced payment model, time in program, total inpatient expenditures, and total outpatient expenditures.

H_{a2}: There is a statistically significant relationship between ACO efficiency and ACO quality of care among ACOs in the states of Texas and Florida when controlling for shared savings plan, the investment model, the advanced payment model, time in program, total inpatient expenditures, and total outpatient expenditures.

During the multiple regression analysis, I followed these specific steps:

1. I examined the descriptive statistics of the continuous variables.
2. I examined the histograms of the variables.
3. I examined correlations and scatter diagrams of the variables.
4. I completed a multiple regression analysis by running a model with the variables.
5. I checked the model: multicollinearity, normality, and homogeneity of variance).
6. I checked for any outliers.
7. I examined the significance of coefficient estimates to trim the model.
8. I revised the model.
9. I wrote the final multiple regression equation and interpreted any coefficient estimates (Ross & Willson, 2017).

10. I completed a t-test from the multiple regression and then determined the *p*-values.
11. If *p*-value <0.05, significance was determined.
12. If *p*-value >0.05, no significance was determined.

When completing the multiple regression analysis, I used SPSS (Version 25).

Threats to Validity

There are some threats to validity that need to be discussed within this research. For example, all ACOs that were in the states of Florida and Texas were used in this study. Therefore, the findings of this study may not be generalized to other geographical regions in the United States outside of the one being studied. Additionally, this research focused on specific inputs and outputs that included expenditures per capita, the number of specialists to the total number of medical doctors, and the percentage of PCPs with electronic health records, and risk-adjusted Medicare beneficiaries such as ESRD beneficiaries, disabled beneficiaries, aged/dual beneficiaries, aged/non-dual beneficiaries and earned savings. Therefore, any other variables outside of these parameters would need to be studied further, as these variables were in alignment with the purpose of this study.

Selection bias was addressed as I utilized all ACOs in the states of Florida and Texas when conducting this study. Additionally, I ensured that each data record met specific criteria. Therefore, I ensured that:

1. Each data entry included ACOs.
2. Each data entry included the states of Florida and Texas.

Each data entry ensured inputs that included:

1. Expenditures per capita, the number of specialists and total number of medical doctors, and the inverse of the percentage of PCPs who utilized electronic health records.
2. Each data entry ensured outputs that included risk-adjusted Medicare beneficiaries such as ESRD beneficiaries, disabled beneficiaries, aged/dual beneficiaries, aged/non-dual beneficiaries and earned savings.
3. Each data entry included 2018 data composite scores and total benchmark expenditures.

Ethical Procedures

There were ethical procedures that were followed within this study. Before beginning the study, I ensured that I received permission from my university's Institutional Review Board (IRB). I did not begin collecting the data or beginning the study until such approval had been provided. Another ethical consideration was the data that was collected. Because I collected public information that did not require authorization or approval for use in research studies, I ensured that I did not change or alter the information in any manner. However, I worked to deidentify the data, ensuring that ACO names were not included in the analysis. Additionally, the hospital data that I used included all ACOs in the states of Florida and Texas. Finally, I stored the data in a password-protected removable hard drive that is locked inside a filing cabinet located inside the home office of my personal residence. Only I have access to the data. All the data will be destroyed after a period of three years, which is in alignment with his

university's IRB policies and procedures. I will destroy electronic data by deleting it from both the removeable hard drive and my computer's internal hard drive.

Summary

The purpose of this quantitative study was to examine the relationships between ACO efficiency, ACO financial performance, and ACO quality scores in the states of Florida and Texas, two states with large Medicare populations. Additionally, I determined any relationships between quality of care and financial performance in relation to geographical locations, shared savings models, advanced payment models, and investment models for ACOs in the United States. This section provided a comprehensive overview of the study's research design and data collection, and began by discussing the research design and rationale, as I utilized a two-step method of DEAP and a multiple regression analysis. After addressing the study's population, sampling and sampling procedures, and the instrumentation and operationalization of constructs, I determined that I would need to collect data from a total of 87 ACOs from the states of Florida and Texas. This section then concluded with a discussion on the study's ethical procedures that I followed. The next section is that of Section 3 that will present this study's results and subsequent findings.

Section 3: Presentation of the Results and Findings

The purpose of this quantitative study was to examine the relationships between ACO efficiency, ACO financial performance, and ACO quality scores in the states of Florida and Texas, two states with large Medicare populations. Additionally, I was to determine if any relationships existed between financial benchmark expenditures in relation to geographical locations, shared savings models, advanced payment models, and investment models for ACOs in the United States. To address the problem in this study, the approach used a two-step process of a DEA in DEAP and multiple regression. Through this methodology, data were gathered from the CMS shared savings program ACO dataset that provides 2018 composite scores and total benchmark expenditures in relation to ACO name and state of healthcare facilities.

When completing the data analysis, it was important for me to highlight the study's research questions and hypotheses. Two research questions guided this study that aimed to determine whether there was a statistically significant relationship between ACO efficiency and ACO performance in ACOs in the states of Texas and Florida, and whether there was a statistically significant relationship between ACO efficiency and ACO quality of care. Both research questions were controlled for total inpatient expenditures, total outpatient expenditures, Texas, and Florida. Therefore, the research hypothesis for the first research question was that there was a statistically significant relationship between ACO efficiency and ACO financial performance in ACOs in the states of Texas and Florida; the research hypothesis for the second research question was

that there is a statistically significant relationship between ACO efficiency and ACO quality of care among ACOs in the states of Texas and Florida.

This section will present this study's results and findings. The section will begin by providing an overview of the secondary dataset and the DEA. I will then discuss the study's descriptive statistics, the correlation analysis, and the multiple linear regression, where I will answer the research questions and hypotheses that guided this study.

Secondary Data Set

In this study, I used a secondary data set. I downloaded the CMS shared savings program data for the year 2018 from the CMS website (https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/sharedsavingsprogram/program-data). No permission was required to collect these data as they were in the public domain and could be freely downloaded from the website. I used SPSS, which provided appropriate sample sizes in relation to the study's effect, power, and error of probability to determine the appropriate sample size (see Table 2). Therefore, SPSS recommended a sample size of 87 hospitals, with a power of 0.8. Additionally, when completing the power analysis, I included assumptions such as *R* squared at 0.25 with eight predictors. The predictors included (a) the shared savings plan, (b) the investment model, (c) the advanced payment model, (d) time in program, (e) total inpatient expenditures, and (f) total outpatient expenditures, and (g) efficiency scores. Therefore, because there is a total of 99 ACOs in the states of Florida and Texas, I downloaded all records in both states.

Table 2

Descriptive Statistics for the Input-Output Variables Used in the DEA Analysis

	N	Minimum	Maximum	*M*	*SD*
EarnSaveLoss	107	0	50087988	3123837.79	6201090.680
N_AB_Year_PY	107	3626	121350	15599.95	17938.331
N_AB_Year_ESRD_PY	107	24	854	143.98	141.508
N_AB_Year_DIS_PY	107	226	10506	1499.08	1676.273
N_AB_Year_AGED_Dual_PY	107	62	5332	1065.07	1152.366
N_AB_Year_AGED_NonDual_PY	107	469	105927	12891.79	15755.853
N_PCP	107	15	2153	178.55	285.668
N_Spec	107	0	3996	251.79	562.878
Per_Capita_Exp_TOTAL_PY	107	8995	27470	12130.85	2800.790
ACO11	107	76.790000000000000	100.000000000000000	97.352803738317750	3.815686786123462
Valid *N* (listwise)	107				

DEA

DEA provides an absolute efficiency measure to evaluate decision making units (DMUs) with multiple inputs and outputs. In DEA, a DMU is efficient when *h0* = 1, meaning that the constraint for that DMU is active and, thus, its slack is zero. In this study, slack was defined as any leftover portions of inefficiencies; a slack allowed me to push any DMUs to the target (Agarwal et al., 2011). The model's basic assumption is to use the slack as an efficiency measurement instead of h. The implications of this DEA

model are to find a target of a DMU which maximizes the performance score in relation to financial performance of ACOs.

The results from the DEA analysis listed below showed the efficiency summary. To reach the efficiency score I first had to create my data file (Eg1-dta). My data file consisted of 107 DMUs comprised of ACOs from Texas and Florida, four input variables and six output variables. The output variables were total person-years in performance attributed to the ACO, ESRD person-years in performance year, disabled beneficiaries, aged/dual beneficiaries, aged/non-dual beneficiaries, and earned savings. The input variables used were expenditures per capita, the percentage of specialists (number of specialists divided by total number of medical doctors), and the inverse percentage of PCPs with electronic health records. When completed the instruction file (Eg1-ins) must be completed to reflect the sample size, number of input and output variables. The Variable Return to Scale model (VRS) along with DEA (1 – stage) was utilized to calculate efficiency. Given the DMU and efficiency scores for the ACOs (see Table 3), there are 32 efficient DMUs and 75 inefficient DMUs with a mean of 0.944.

Table 3

Results From DEAP on ACO DMUs and Efficiency Summary

SN	Firm	Crste	Vrste
1	1.000	1.000	1.000
2	0.555	1.000	0.555
3	0.291	0.796	0.366
4	0.830	0.945	0.878
5	0.581	0.977	0.594
6	0.787	0.959	0.821
7	0.651	0.864	0.753
8	0.657	1.000	0.657
9	0.806	0.958	0.841
10	1.000	1.000	1.000
11	0.534	0.854	0.625
12	0.867	1.000	0.867
13	0.872	1.000	0.872
14	0.667	0.891	0.748
15	0.894	0.979	0.913
16	0.665	0.948	0.702
17	0.794	0.937	0.848
18	1.000	1.000	1.000
19	1.000	1.000	1.000
20	0.832	0.939	0.885
21	1.000	1.000	1.000
22	0.636	0.876	0.726
23	0.528	0.881	0.599
24	0.366	0.807	0.453
25	0.963	1.000	0.963
26	0.448	0.935	0.479
27	0.556	0.938	0.593
28	0.906	0.979	0.925
29	1.000	1.000	1.000
30	1.000	1.000	1.000
31	0.799	0.967	0.826
32	0.795	0.916	0.868
33	0.394	0.869	0.453
34	0.663	0.937	0.708
35	0.692	0.888	0.779
36	1.000	1.000	1.000
37	0.866	0.950	0.912
38	0.808	1.000	0.808
39	0.727	0.960	0.757

SN	Firm	Crste	Vrste
40	0.559	0.873	0.640
41	0.570	0.829	0.688
42	0.421	0.861	0.489
43	0.972	0.992	0.980
44	0.915	0.995	0.919
45	0.622	0.910	0.684
46	0.763	0.940	0.812
47	0.770	0.914	0.842
48	0.785	0.894	0.878
49	0.837	0.986	0.849
50	0.903	0.966	0.935
51	0.742	0.938	0.791
52	0.413	0.887	0.465
53	0.704	0.933	0.754
54	0.825	0.986	0.836
55	0.827	0.933	0.886
56	1.000	1.000	1.000
57	1.000	1.000	1.000
58	0.747	0.964	0.775
59	0.644	0.861	0.747
60	0.648	0.872	0.744
61	0.607	0.890	0.682
62	0.688	0.898	0.765
63	0.917	1.000	0.917
64	0.757	0.951	0.796
65	0.767	0.971	0.790
66	0.777	0.959	0.811
67	0.545	0.933	0.585
68	0.856	0.970	0.883
69	1.000	1.000	1.000
70	0.591	0.915	0.645
71	1.000	1.000	1.000
72	0.968	0.999	0.969
73	0.856	0.969	0.883
74	0.660	0.888	0.743
75	0.514	0.863	0.596
76	1.000	1.000	1.000
77	0.630	0.924	0.682
78	0.556	0.934	0.595
79	0.778	1.000	0.778
80	0.512	0.957	0.535
81	0.881	0.969	0.908
82	0.744	0.930	0.800

SN	Firm	Crste	Vrste
83	0.831	0.950	0.874
84	1.000	1.000	1.000
85	0.523	0.878	0.596
86	0.466	0.885	0.527
87	1.000	1.000	1.000
88	1.000	1.000	1.000
89	0.783	1.000	0.783
90	1.000	1.000	1.000
91	1.000	1.000	1.000
92	0.729	0.946	0.771
93	0.407	0.824	0.494
94	1.487	0.863	0.564
95	1.000	1.000	1.000
96	0.598	0.851	0.703
97	0.328	0.785	0.417
98	0.735	0.930	0.789
99	0.868	0.933	0.931
100	0.460	0.954	0.483
101	0.534	0.862	0.619
102	1.000	1.000	1.000
103	0.728	0.986	0.738
104	1.000	1.000	1.000
105	0.837	1.000	0.837
106	1.000	1.000	1.000
107	0.316	0.961	0.329
Mean	0.751	0.944	0.788

Descriptive Statistics

Table 4 highlights the descriptive statistics of the continuous variables (Total Inpatient Expenditures, Outpatient Expenditures, and Financial Performance). The mean for Total Inpatient Expenditures, Outpatient Expenditures, and Financial Performance is given as 3568.48, 2077.75, and 5736973.92, respectively. The standard deviation is given as 950.949, 594.080, and 13684328.789, respectively. Based on these standard deviations, a wide spread of the data points was recorded only for Financial Performance.

Table 4

Descriptive Statistics for Continuous Variables

		Total inpatient expenditures	Outpatient expenditures	Efficiency score	Quality score	Financial performance
N	Valid	107	107	107	107	107
	Missing	0	0	0	0	0
M		3568.48	2077.75	.94404	.927074	5736973.92
SD		950.949	594.080	.055849	.0672405	13684328.789
Minimum		2141	1033	.785	.7048	-21377847
Maximum		8281	5014	1	1	112523299

Table 5 shows the descriptive statistics of the categorical variables (Shared Savings Program_Track_1, Shared Savings Program_Track_2, Shared Savings Program_Track_3, Texas, and Florida). The mean for Shared Savings Program_Track_1, Shared Savings Program_Track_2, Shared Savings Program_Track_3, Texas, and Florida is given as .92, .02,.02, .2991, and .3832, respectively. The standard deviation is given as .279, .136, .136, .46000, and .48845, respectively. Based on these standard deviations, a wide spread of the data points was recorded only for Florida and Texas.

Table 5

Descriptive Statistics for Categorical Variables

		Shared Savings Program_Track_1	Shared Savings Program_Track_2	Shared Savings Program_Track_3	Texas	Florida
N	Valid	107	107	107	107	107
	Missing	0	0	0	0	0
M		.92	.02	.02	.2991	.3832
SD		.279	.136	.136	.46000	.48845
Minimum		0	0	0	0	0
Maximum		1	1	1	1	1

Figure 3 displays a non-normal histogram for the variable efficiency score. Figure 4 displays a non-normal histogram for the variable quality score.

Figure 3

Histogram- Dependent Variable Efficiency Score

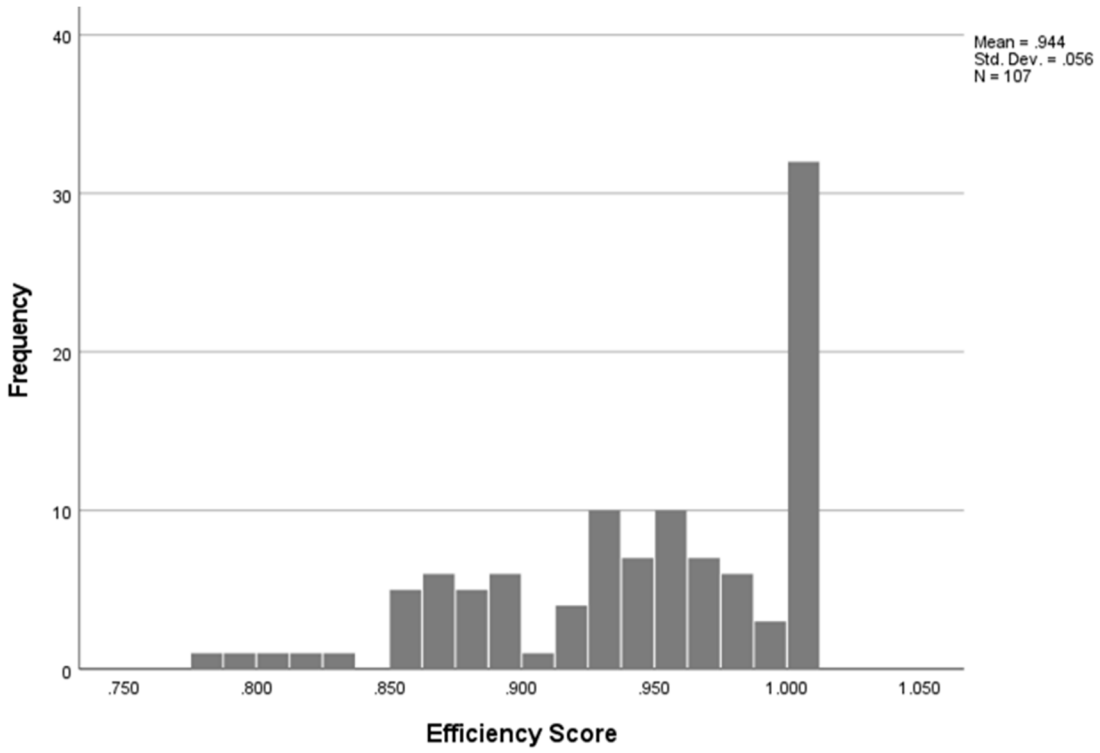
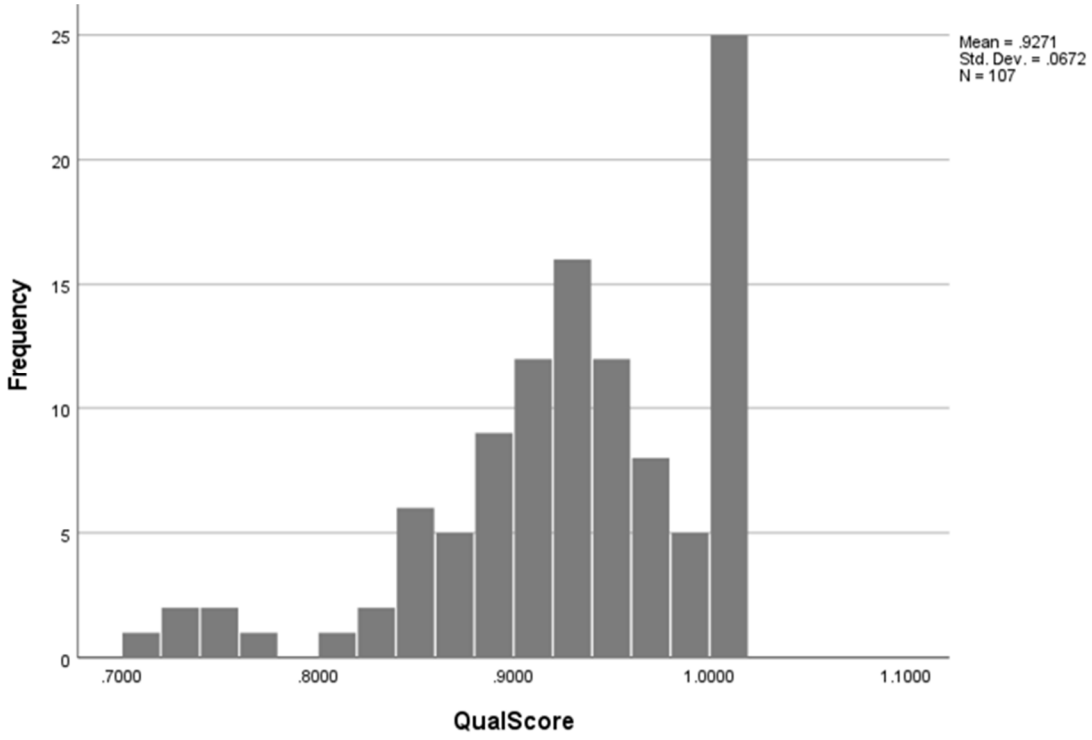


Figure 4

Histogram of Dependent Variable Quality Score



The descriptive statistics further included the frequency and percentage distribution for Shared Savings Program_Track_1 (see Table 6). The study targeted 107 ACOs, of which complete data was available for all of them. In the analysis, 0 = ACO does not participate, and 1 = ACO participates in the program. The 107 ACOs comprised nine nonparticipants and 98 participants in the program. This indicates that 91.6% of the sampled ACOs were enrolled in the Shared Savings Program_Track_1, while only 8.4% of the ACOs were not.

Table 6

Shared Savings Program_Track_1

		Frequency	Percent	Valid percent	Cumulative percent
Valid	0	9	8.4	8.4	8.4
	1	98	91.6	91.6	100.0
	Total	107	100.0	100.0	

The descriptive statistics further included the frequency and percentage distribution for Shared Savings Program_Track_2 (see Table 7). The study targeted 107 ACOs, of which complete data was available for all of them. In the analysis, 0 = ACO does not participate, and 1 = ACO participates in the program. The 107 ACOs comprised 105 nonparticipants and 2 participants in the program. This indicates that 98.1% of the sampled ACOs were not enrolled in the Shared Savings Program_Track_1, while only 1.9% of the ACOs were.

Table 7

Shared Savings Program_Track_2

		Frequency	Percent	Valid percent	Cumulative percent
Valid	0	105	98.1	98.1	98.1
	1	2	1.9	1.9	100.0
	Total	107	100.0	100.0	

The descriptive statistics further included the frequency and percentage distribution for Advance Payment Model (see Table 8). The study targeted 107 ACOs, of which complete data was available for all of them. In the analysis 0 = ACO does not participate and 1 = ACO participates in the model. The 107 ACOs comprised 99 nonparticipants and eight participants in the use of the model. This indicates that 92.5%

of the sampled ACOs did not use the Advance Payment Model, while only 7.5% of the ACOs did.

Table 8

Advance Payment Model

		Frequency	Percent	Valid percent	Cumulative percent
Valid	0	99	92.5	92.5	92.5
	1	8	7.5	7.5	100.0
	Total	107	100.0	100.0	

The descriptive statistics further included the frequency and percentage distribution for ACO investment model (see Table 9). The study targeted 107 ACOs, of which complete data was available for all of them. In the analysis, 0 = ACO does not participate and 1 = ACO participates in the model. The 107 ACOs comprised 99 nonparticipants and eight participants in the use of the model. This indicates that 92.5% of the sampled ACOs did not use the Advance Payment Model, while only 7.5% of the ACOs did. All Payment Model in this study have less than ten cases and will be dropped from the multivariate analysis.

Table 9

ACO Investment Model

		Frequency	Percent	Valid percent	Cumulative percent
Valid	0	99	92.5	92.5	92.5
	1	8	7.5	7.5	100.0
	Total	107	100.0	100.0	

Note: ACO = accountable care organization

The descriptive statistics further included the frequency and percentage distribution for Texas ACOs (see Table 10). The study targeted 107 ACOs, of which

complete data was available for all of them. In the analysis, 0 = Texas valid quality score, and 1 = other non-valid quality score. Out of the 107 samples, Texas had 75 ACOs with a valid quality score. This indicates that 76.6% of the sampled ACOs possessed a valid quality score.

Table 10

Texas ACOs

		Frequency	Percent	Valid percent	Cumulative percent
Valid	.00	75	70.1	70.1	70.1
	1.00	32	29.9	29.9	100.0
	Total	107	100.0	100.0	

Note: ACO = accountable care organization

The descriptive statistics further included the frequency and percentage distribution for Florida ACOs (see Table 11). The study targeted 107 ACOs, of which complete data was available for all of them. In the analysis, 0 = Florida valid quality score, and 1= other non-valid quality score. Out of the 107 samples, the state of Florida had 66 ACOs with a valid quality score. This indicates that 61.7% of the sampled ACOs possessed a valid quality score.

Table 11

Florida ACOs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	66	61.7	61.7	61.7
	1.00	41	38.3	38.3	100.0
	Total	107	100.0	100.0	

Note: ACO = accountable care organization

A frequency histogram was conducted on the continuous variables in this study (i.e., financial performance, outpatient expenditures, and total inpatient expenditures)

with a sample size of 107 ACOs from Texas and Florida. A frequency histogram is a graphical version of a frequency distribution where the width and position of rectangles indicate the various classes, with the heights of those rectangles indicating the frequency with which data fell into the associated class. A normal distribution, or Gaussian distribution, is important; it displays a probability distribution that is symmetric about the mean, showing that data near the mean are more frequent in occurrence than data far from the mean. In graph form, normal distribution will appear as a bell curve.

Figure 5 highlights the financial performance and frequency results for the year 2018 with a mean 5,736,973.92 and a very large standard deviation 13,684,328.789 extracted from the histogram.

Figure 5

Histogram of Financial Performance

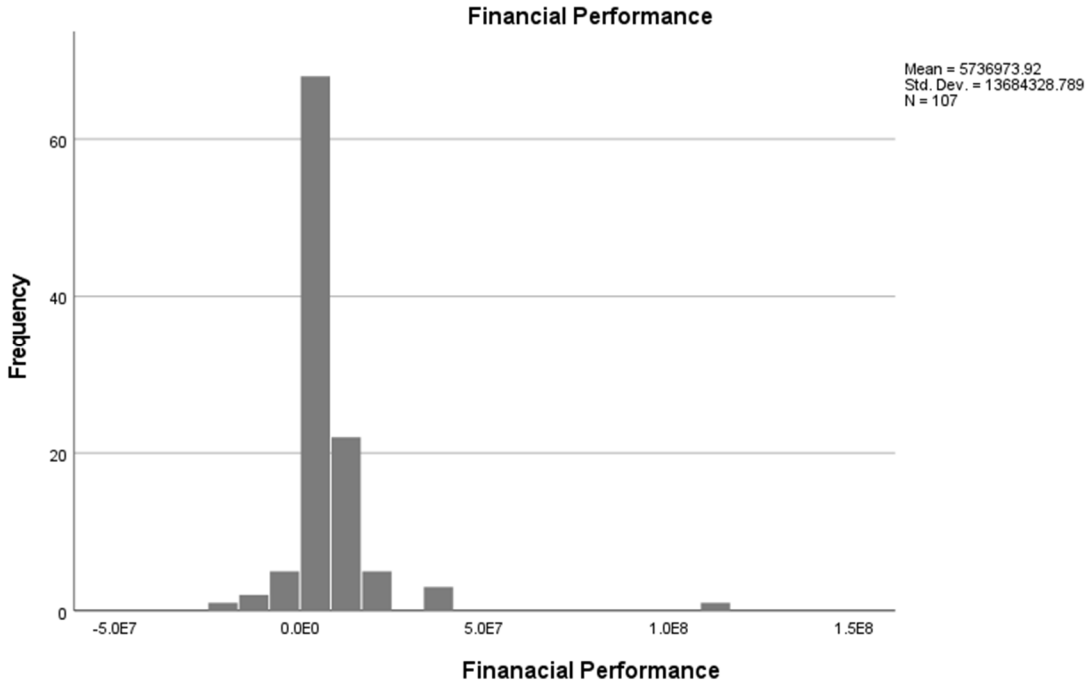
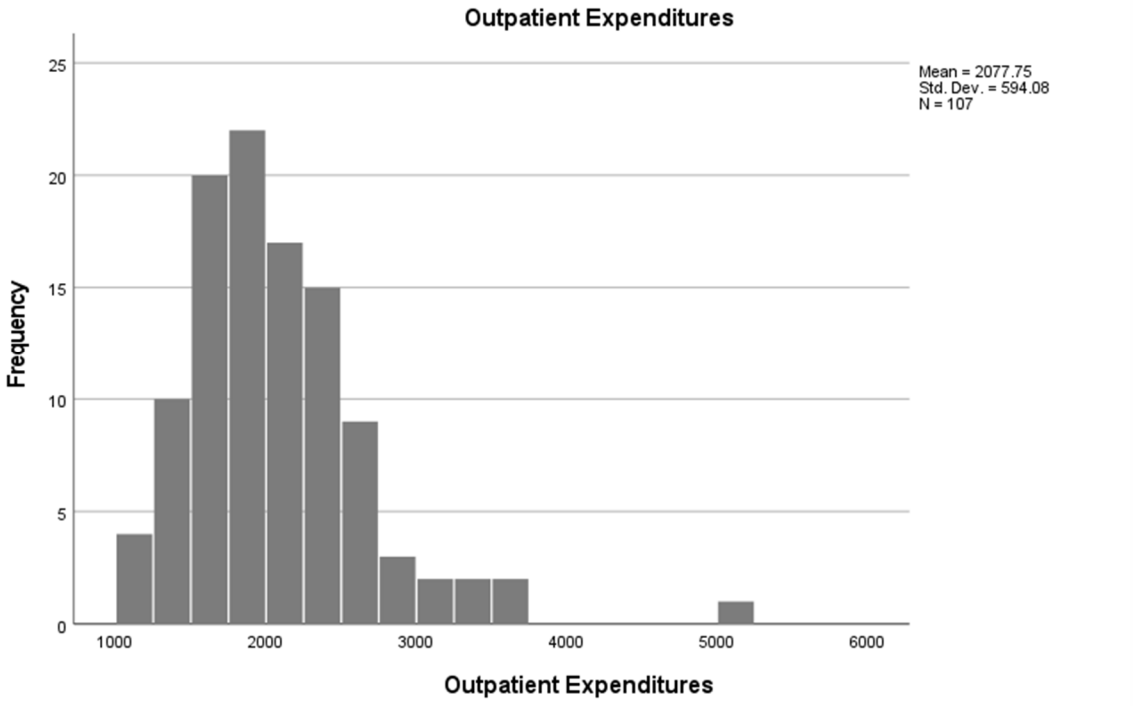


Figure 6 highlights the financial performance and frequency histogram results for the year 2018. The mean and standard deviation is given as 2,077.75 and 594.08, respectively.

Figure 6

Histogram of Outpatient Expenditure

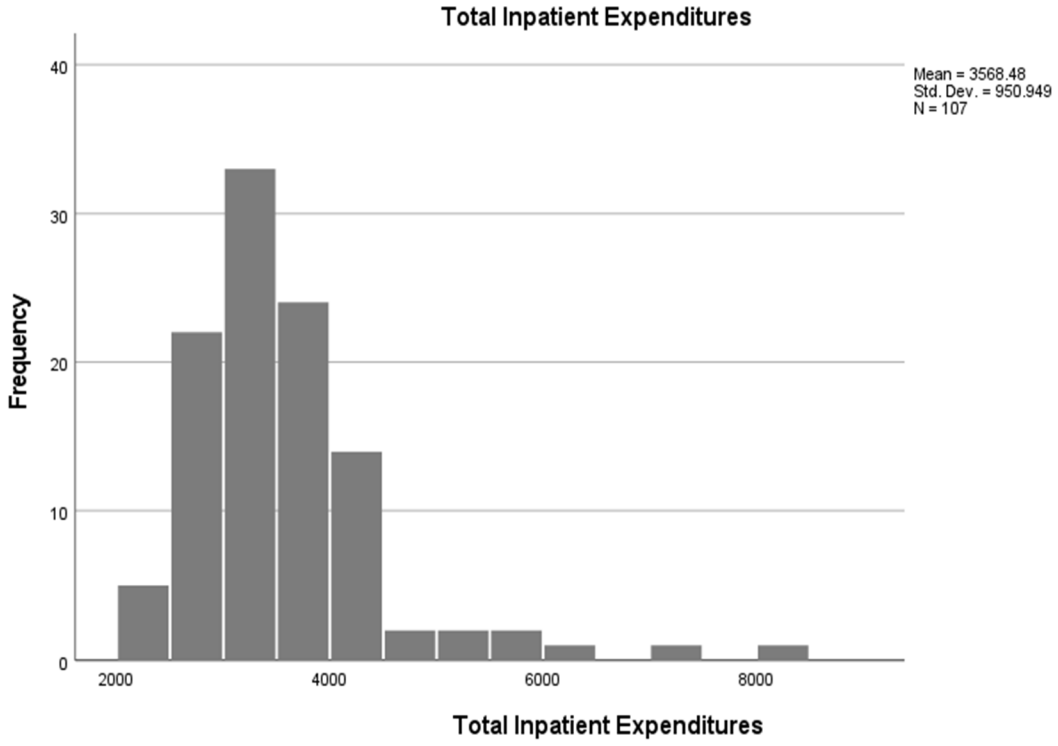


Finally, Figure 7 highlights the total outpatient expenditures and frequency histogram results for the year 2018. Additionally, parametric tests were performed in this study. Parametric tests are based on assumptions about the distribution of the underlying population from which the sample was taken. The most common parametric assumption is that data are approximately normally distributed. In addition, the histograms below

indicates that the residuals are almost normally distributed. Thus, the assumption of normal distribution of errors was not violated.

Figure 7

Histogram of Total Inpatient Expenditure



Correlation Analysis

The Pearson's Correlation is used when we are interested in finding linear relationship between two quantitative variables. Table 12 covers the Pearson Correlations Explanations of variables: Total inpatient expenditures display a positive correlation for outpatient expenditures (.551) with a strong effect and statistically significant with a p-value of (.000). This suggest that an increase in ACOs' total inpatient expenditures will more than likely show an increase ACO outpatient expenditure.

Total inpatient expenditures show a negative correlation for Florida (-.313) with a medium effect and statistically significant with a p-value of (.001). This suggests that being in Florida predicts lower Total inpatient expenditures. Outpatient expenditures shows a negative correlation for Florida (-.383) with a medium effect and statistically significant with a p-value of (.000). This suggests that being in Florida predicts lower outpatient expenditures.

Financial expenditures display a positive correlation for efficiency (.306) with a medium effect and statistically significant with a p-value of (.001). This suggests that ACOs that show an increase in financial performance will more than likely show an increase in efficiency. Financial expenditures display a negative correlation for quality (-.105) with a medium effect and non-statistically significant with a p-value of (.279).

Table 12

Pearson Correlations Explanations of Variables

Variable	SH1	SH2	SH3	IM	APM	TIE	OE	FL	FP	OS	EFF	TX
SH1	1											
SH2		1										
SH3			1									
IM				1								
APM					1							
TIE						1						
OE						.551**	1					
FL						-.313**	-.383**	1				
FP						-	-	-	1			
EFF						-	-	-	.306**		1	
OS									-.105	1		
TX												1

Note. SH1 = Shared Savings Program_Track_1; SH2 = Shared Savings Program_Track_2; SH3 = Shared Savings Program_Track_3; IM = Investment model; APM = Advanced payment model; TIE = Total Inpatient Expenditures; OE = Outpatient Expenditures; FL = Florida; FP = Financial Performance; EFF = Efficiency; OS = QualScore; TX = Texas.

Model Summary

Table 13, titled *Model Summary*, provides information about each step/block of the analysis. Although data from each of the columns provide information about the analysis, the most critical information from this table appears in the following columns: R, R Square, and Sig. F. Change. Model 1 has an R Square value of .154, which can be interpreted that, the Advance Payment model, the Shared Savings Program_Track_1, Shared Savings Program_Track_2, Shared Savings Program_Track_3, Investment model, Florida, efficiency, quality, CapAnn_INP_All, Texas and CapAnn_OPD account for 15.4% of the variance in GenSaveLoss. This also indicates a moderate model fit. The Durbin-Watson statistic is a test for autocorrelation in the residuals from a regression analysis. The Durbin-Watson statistic of 1.941 suggests that there exists no or a slightly positive autocorrelation as our value is approximately 2, which signifies no autocorrelation at all.

Table 13

Model Summary

Model	R	R square	Adjusted R square	Std. error of the estimate	Durbin-Watson
1	.392[a]	.154	.066	13227676.710	1.941

Note: [a] Predictors: (Constant), Initial_Track_3, Initial_Track_2, AIM, CapAnn_INP_All, Texas, Adv_Pay, Efficiency Score, Florida, Initial_Track_1, CapAnn_OPD
[b] Dependent Variable: GenSaveLoss

RQ1: Is there a statistically significant relationship between ACO efficiency and ACO financial performance in ACOs in the states of Texas and Florida when controlling for shared savings plan, the investment model, the advanced payment model, time in program, total inpatient expenditures, and total outpatient expenditures?

The regression coefficient from Table 14 shows that efficiency (b = 27974682.298, $p \leq 0.001$) had a positive effect and are statistically significant. Thus, we can say that there was a statistically significant relationship between ACO efficiency and ACO financial performance in ACOs in the states of Texas and Florida when controlling for shared savings plan, the investment model, the advanced payment model, total inpatient expenditures, and total outpatient expenditures. The Variance Inflation Factor is a popular method for detecting multicollinearity in regression models. It determines how much collinearity has inflated the variance (or standard error) of the predicted regression coefficient. In general, a VIF greater than 4 or a tolerance less than 0.25 suggests the presence of multicollinearity, and further analysis is required. There is severe multicollinearity that needs to be adjusted when VIF is greater than 10 or tolerance is less than 0.1. From Table 14, the VIF for all independent and control variables are moderate since they are below 4. Thus, it can be said that there is no suggestion of multicollinearity. Also, from the tolerance which had all its value above 0.25, suggests no presence of multicollinearity.

Table 14

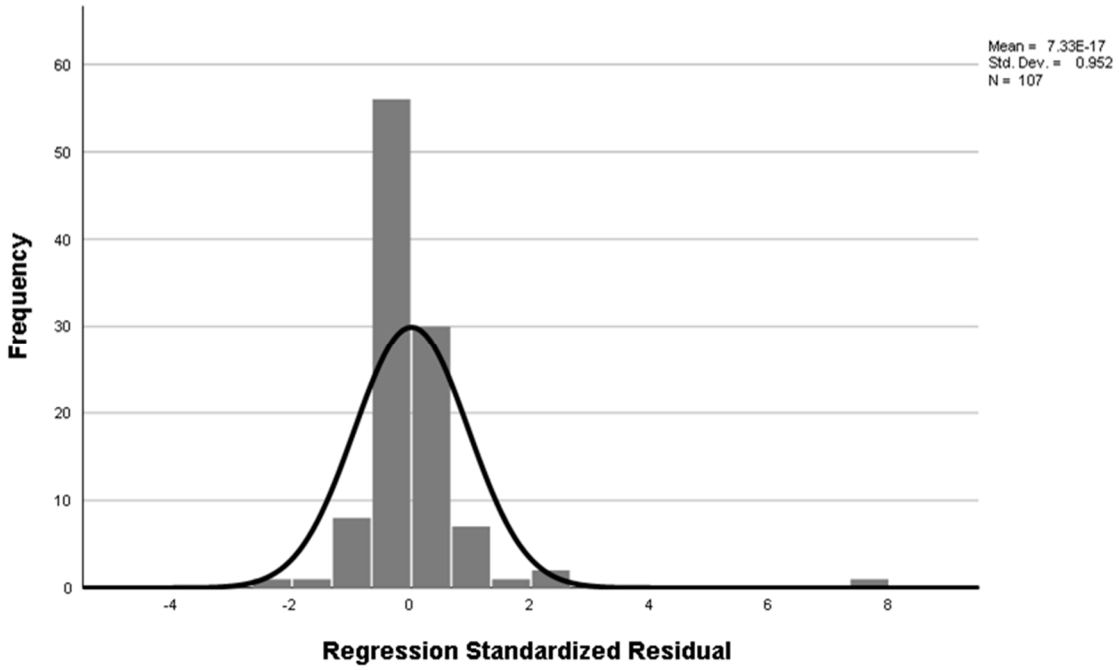
Regression Coefficient Table with GenSaveLoss as Dependent Variable

Model		Unstandardized coefficients		Standardized coefficients	*t*	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	β			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	-29860785.033	12960352.516		-2.304	.023	-55586881.449	-4134688.616		
	Efficiency Score	27974682.298	8209809.252	.362	3.407	<.001	11678339.732	44271024.864	.781	1.280
	Initial_Track_1	4576913.082	6137324.936	.093	.746	.458	-7605580.631	16759406.795	.564	1.774
	Adv_Pay	-1245314.618	5142873.665	-.024	-.242	.809	-11453838.159	8963208.922	.894	1.119
	AIM	-309581.276	4962607.109	-.006	-.062	.950	-10160278.531	9541115.980	.960	1.042
	Texas	1323393.925	3570687.946	.044	.371	.712	-5764365.629	8411153.479	.612	1.634
	Florida	7089312.767	3664770.431	.253	1.934	.056	-185199.044	14363824.578	.515	1.941
	CapAnn_INP_All	846.704	1663.897	.059	.509	.612	-2456.105	4149.513	.659	1.517
	CapAnn_OPD	1190.474	3010.921	.052	.395	.693	-4786.156	7167.104	.516	1.938
	Initial_Track_2	7519789.899	11607096.823	.075	.648	.519	-15520115.198	30559694.996	.662	1.511
	Initial_Track_3	5732106.375	11363316.272	.057	.504	.615	-16823898.152	28288110.901	.690	1.448

The histogram in Figure 8 indicates that the variables are almost normally distributed. It can, therefore, be concluded that the assumptions of normal distribution of errors was not violated.

Figure 8

Standardized Residual of the Regression with GenSaveLoss as Dependent Variable



RQ2: Is there a statistically significant relationship between ACO efficiency and ACO quality of care among ACOs in the states of Texas and Florida when controlling for shared savings plan, the investment model, the advanced payment model, time in program, total inpatient expenditures, and total outpatient expenditures?

Table 15, which contains information on the model summary, tells that the independent variables Florida, efficiency, CapAnn_INP_All, Texas, CapAnn_OPD Initial_Track_1, Initial_Track_2, Initial_Track_3 tells 25.3% of the dependent variable

Quality Score. The Durbin-Watson statistic suggests that there exists no or a slightly positive autocorrelation as our value is approximately 2, thus signifying no autocorrelation at all.

Table 15

Model Summary

Model	R	R square	Adjusted R square	Std. error of the estimate	Durbin-Watson
1	.503[a]	.253	.175	.0610708	2.057

Note: [a] Predictors: (Constant), Initial_Track_3, Initial_Track_2, AIM, CapAnn_INP_All, Texas, Adv_Pay, Efficiency Score, Florida, Initial_Track_1, CapAnn_OPD
[b] Dependent Variable: QualScore

From the regression analysis highlighted in Table 16, there no statistically significant relationship between ACO efficiency and ACO quality of care among ACOs in the states of Texas and Florida when controlling for shared savings plan, the investment model, the advanced payment model, total inpatient expenditures, and total outpatient. The VIF for all independent and control variables are moderate since they are below 4. Thus, it can be said that there is no suggestion of multicollinearity. Also, from the tolerance which had all its value above 0.25, suggests no presence of multicollinearity.

Table 16

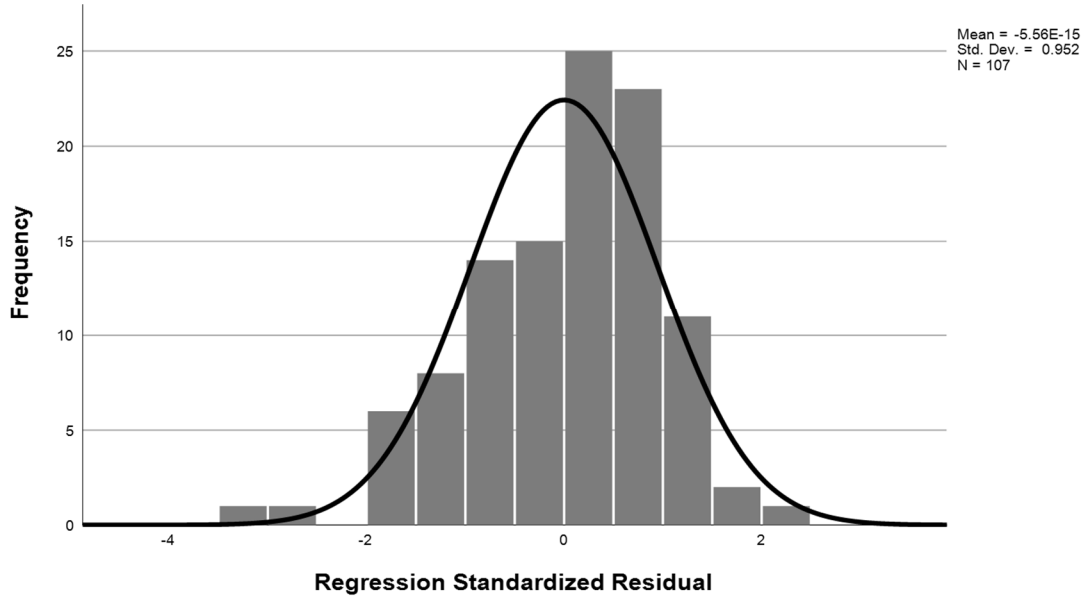
Regression Coefficient Table with QualScore as Dependent Variable

Model		Unstandardized coefficients		Standardized coefficients	*t*	Sig.	95.0% confidence interval for B		Collinearity statistics	
		B	Std. Error	β			Lower bound	Upper bound	Tolerance	VIF
1	(Constant)	1.093	.060		18.259	<.001	.974	1.211		
	Efficiency Score	-.031	.038	-.081	-.809	.420	-.106	.045	.781	1.280
	Initial_Track_1	-.051	.028	-.210	-1.785	.077	-.107	.006	.564	1.774
	Adv_Pay	-.037	.024	-.145	-1.552	.124	-.084	.010	.894	1.119
	AIM	-.064	.023	-.252	-2.801	.006	-.110	-.019	.960	1.042
	Texas	-.017	.016	-.119	-1.053	.295	-.050	.015	.612	1.634
	Florida	-.024	.017	-.173	-1.406	.163	-.057	.010	.515	1.941
	CapAnn_INP_All	-2.578E-5	.000	-.365	-3.356	.001	.000	.000	.659	1.517
	CapAnn_OPD	9.396E-6	.000	.083	.676	.501	.000	.000	.516	1.938
	Initial_Track_2	-.004	.054	-.009	-.081	.936	-.111	.102	.662	1.511
	Initial_Track_3	.007	.052	.013	.124	.901	-.098	.111	.690	1.448

The histogram in Figure 9 indicates that the variables are almost normally distributed. It can, therefore, be concluded that the assumptions of normal distribution of errors was not violated.

Figure 9

Quality Score Histogram of Regression Standardized Residual



Summary

The purpose of this quantitative study was to examine the relationships between ACO efficiency, ACO financial performance, and ACO quality scores in the states of Florida and Texas, two states with large Medicare populations. Additionally, I was to determine if any relationships existed between financial benchmark expenditures in relation to geographical locations, shared savings models, advanced payment models, and investment models for ACOs in the United States. Two research questions guided this study that aimed to determine if there was a statistically significant relationship between

ACO efficiency and ACO performance in ACOs in the states of Texas and Florida, and whether there was a statistically significant relationship between ACO efficiency and ACO quality of care. Both research questions were controlled for total inpatient expenditures, total outpatient expenditures, Texas, and Florida. Therefore, the research hypothesis for research question one was that there was a statistically significant relationship between ACO efficiency and ACO financial performance in ACOs in the states of Texas and Florida; the research hypothesis for the second research question was that there is a statistically significant relationship between ACO efficiency and ACO quality of care among ACOs in the states of Texas and Florida.

The result shows that there is a statistically significant relationship between ACO efficiency and ACO financial performance in ACOs in the states of Texas and Florida when controlling for shared savings plan, the investment model, the advanced payment model, total inpatient expenditures, total outpatient expenditures and location. However, the results also revealed there was not a relationship between ACO efficiency and ACO quality in ACOs in the states of Texas and Florida when controlling for shared savings plan, the investment model, the advanced payment model, total inpatient expenditures, total outpatient expenditures, Texas, and Florida. This confirms the first research hypothesis:

> H_{a1}: There is a statistically significant relationship between ACO efficiency and ACO financial performance in ACOs in the states of Texas and Florida when controlling for shared savings plan, the investment model, the advanced payment

model, time in program, total inpatient expenditures, and total outpatient expenditures.

H_{01}: There is not a statistically significant relationship between ACO efficiency and ACO quality of care among ACOs in the states of Texas and Florida when controlling for shared savings plan, the investment model, the advanced payment model, time in program, total inpatient expenditures, and total outpatient expenditures.

The next section will conclude the study by discussing the application to professional practice and the implications for social change.

Section 4: Application to Professional Practice and Implications for Social Change

The purpose of this quantitative study was to examine the relationships between ACO efficiency, ACO financial performance, and ACO quality scores in the states of Florida and Texas. Guided by structural contingency theory, the research questions asked if there was a statistically significant relationship between efficiency and financial performance, as well as efficiency and the quality of care among ACOs in the states of Texas and Florida in 2018 using all ACOs located in the states. Data were drawn from the CMS shared savings program ACOs dataset that provides 2018 composite scores and total benchmark expenditures in relation to ACOs located in the states of Florida and Texas. The results of the study concluded that there is a statistically significant relationship between ACO efficiency, ACO financial performance and ACO quality in ACOs in the states of Texas and Florida when controlling for shared savings plan, the investment model, the advanced payment model, total inpatient expenditures, total outpatient expenditures, Texas, and Florida.

This section will conclude the study by providing a comprehensive discussion on the interpretation of the findings. Additionally, I will identify the limitations of the study while providing recommendations for future research. I will then discuss the implications for professional practice and social change.

Interpretation of Findings

There are findings that need to be discussed in relation to previous studies that had been completed in the field. Firstly, the results show a statistically significant relationship between ACO efficiency and ACO financial performance in the states of

Texas and Florida when controlling for shared savings plan, the investment model, the advanced payment model, total inpatient expenditures, total outpatient expenditures and location. This result appears in alignment with previous research. For example, both Falk (2016) and Song et al. (2014) reported that when ACOs bring physicians across specialties and different hospitals together under a similar contractual roof, organizations can better allocate their resources under a spending limit or target, thereby increasing efficiency. This efficiency was researched by Ouayogode et al. (2017), who examined ACOs and market factors that could affect superior financial performance, particularly of Medicare ACO programs. The results of their study concluded that Medicare ACOs performing financially well were those with a greater proportion of primary care providers in the ACO as well as more practicing physicians on the governing board. Simultaneously, those with better financial performance in terms of higher savings and larger shared savings payments, also had improved physician leadership structure, active management in lessening hospital re-admission rates, and a greater number of disabled Medicare beneficiaries assigned towards an ACO, highlighting efficiency (Ouayogode et al., 2017). Furthermore, it is also interesting to note that Ouayogode et al. found that organizational structure did not consistently predict performance. Instead, the organizations with already massive financial benchmarks at baseline had better chances of achieving savings, demonstrating that they were already operating at efficient levels.

Similarly, Palazzolo and Ozcan (2018) conducted a study that aimed to determine whether efficient ACOs achieved requirements to earn shared savings. The authors argued that in 2014, less than one third of the most efficient ACOs earned shared savings.

From the results of a DEA, Palazzolo and Ozcan concluded that out of the 39 ACOs included in the dataset, only 12 achieved earned savings. The authors reported that the remaining ACOs were not efficient, hence it hindered their financial performance. Therefore, the authors argued that it is essential for ACOs to become more efficient, by adopting higher numbers of physicians for emergency health services and by expanding the participation of specialists. Therefore, although financial performance has been linked strongly to efficiency, there are different conclusions regarding if organizational structure is related to financial performance; for example, Ouayogode et al. (2017) found that organizational structure did not consistently predict performance, whereas Palazzolo and Ozcan reported that it did.

To better understand how the results of this current study found that there is a statistically significant relationship between ACO efficiency and ACO financial performance, it is important to highlight research conducted by Aoun (2018). Aoun claimed that the financial performance of Medicare ACOs has varied considerably; some ACOs are able to achieve multi-million-dollar savings, while others incur higher expenses leading them to report financial statement losses. Therefore, the author assessed if financial performance and the size of the beneficiary were indeed significantly related to each other. The results of Aoun's study concluded that contrary to traditional or conventional views, there is no strong correlation between financial performance and the size of an organization. However, it is important to note that the findings of Aoun's study did not discredit the importance of having a larger number of beneficiaries. Although larger ACOs may not be more likely to achieve higher financial performance compared

to smaller ACOs, they can still improve their prediction of healthcare costs, which can help them plan their expenses more efficiently and effectively (Aoun, 2018).

Finally, it is also important to examine this result in relation both financial performance, efficiency, and quality scores. Berkson et al. (2018) conducted a study that concluded that higher savings could be achieved by ACOs with higher baseline expenditures. For example, the author gathered 2013 data for 220 participating ACOs to determine key factors linked to the ACOs' ability to generate savings. Results revealed that ACOs with higher baseline expenditures were significantly more able to achieve savings than lower-cost ACOs. In addition, average quality scores for ACOs that successfully reported on quality remained relatively similar for both the organizations that did and did not generate savings.

The second finding of this study was that there is not a statistically significant relationship between ACO efficiency and ACO quality of care. This finding appears in alignment with previous literature. For example, many researchers have reported that ACOs can offer higher levels of quality of care; that is, an ACO model providers a reason to transform the culture of medicine (Everson et al., 2020; Greer et al., 2020; Harrison et al., 2018), while giving providers from varying specialties the impetus to work together and coordinate with each other so that care can be effectively delivered and not rewarded under a fee-for-service setup. Increased quality of care was found between 2010 and 2014 because of ACOs (Everson et al., 2020).

However, there is one barrier that has been found across research, and that is the financial component. It is still relatively unknown whether ACOs can truly succeed in

decreasing healthcare spending, which continues to remain high and persists as an urgent social problem (Everson et al., 2020; Greer et al., 2020; Harrison et al., 2018). Additionally, Harrison et al. (2018) conducted a study where data were gathered from the 2015 American Hospital Association annual survey and the 2015 Medicare final rule standardizing file and a total of 785 hospitals were assessed that operated under ACO in contrast to 1,446 hospitals that did not participate in the ACO phenomenon. The authors found that the more efficient and successful ACOs are typically located in urban communities and are considered not-for-profit. Based on these findings, it can be concluded that under a single, collective contract at the organizational level, providers are in it together. If providers can break down silos, improve coordination, and manage the population's health, the ACO paradigm would be able to claim higher achievements.

Everson et al. (2020) argued that ACOs are more likely to offer a higher quality of care, simply because of increased sharing of patients among closely affiliated hospitals, which in turn utilize a more significant inter-organizational coordination. As an aside, in this study, efficiency had a strong positive and highly significant effect on generated savings/losses, which could explain how due to the increased affiliations of hospitals and inter-organizational coordination, additional monies must be utilized to provide stronger quality of care for patients. Therefore, future research needs to be continued within this arena to better understand the exact correlations independently.

Limitations of the Study

There were some limitations that were experienced within this study. One of the first limitations was that of the population being studied. This study examined ACOs

located in the states of Florida and Texas, so the results of this study may not be generalizable to other geographical areas simply because populations differ from region to region. Therefore, the results did not consider the natural progression within healthcare to provide quality and cost-effective care, and the results were attributing this solely to the formation of an ACO. Another limitation is the number of ACOs that were used in this study. Because this study used all ACOs in the states of Florida and Texas, the demographics could present differing results that were not otherwise accounted for. For example, there could be a difference between rural, urban, and suburban ACOs within the two states, which could have presented a limitation to the findings.

Another limitation to this study is the explanation of the variables that were used. Although I did my best to provide both active definitions and operationalized constructs of the variables, the ACOs where the data came from could have utilized different measurements than those used in this current study. Yet another limitation to this study is that of the research design that was utilized. The use of a DEA could have had specific drawbacks. For example, one major drawback of DEA is the selection of inputs and outputs. In DEA, inputs and outputs are sensitive, which can promote statistical errors (Ji & Lee, 2010). Additionally, due to the use of DEA, this form of analysis by itself does not provide information necessarily on answers to the research questions (Ji & Lee, 2010). Therefore, I had to utilize an additional analytical method to answer the research questions.

An additional limitation to this study could include the experience of COVID-19. When I first began this study, COVID-19 was not a part of the healthcare landscape.

Since COVID-19's inception in December 2019, many hospitals, healthcare organizations, and ACOs have been burdened with increased patient care, increased costs, and decreased efficiency (Bakshi et al., 2021). Therefore, the results of this study could be limited because of COVID-19, since the data utilized in this study were from 2018. A final limitation is that this study does not compare natural improvement in healthcare delivery. This is due to this current study focusing only on ACOs; if a natural improvement in healthcare delivery is to be investigated, future research would have to compare the elements focused on during this study, yet with a focus on both ACOs and non-ACOs.

Recommendations

Due to the limitations experienced within this study, some recommendations for future research must be acknowledged. The first is to have future research continue to focus on the states of Florida and Texas; however, concentrate on the different geographical areas such as urban, rural, and suburban regions. Because this current study concentrated on all ACOs in each state, future research could inform in better understanding how efficiency, financial performance, and quality of care are related to different urban, rural, and suburban areas. Additionally, future research could also continue to examine ACO efficiency, financial performance, and quality of care within the COVID-19 landscape. Bakshi et al. (2021) reported that ACOs could increase financial risks due to the impact that COVID-19 can bring to the table. Therefore, future research should be completed replicating this study, but with data collected after 2020. This can help better understand any impacts that COVID-19 can have on ACOs.

Future researchers could also conduct a qualitative study to focus on the experiences of stakeholders of ACOs so that they can provide their perceptions regarding how ACOs are influenced by efficiency, financial performance, and quality of care. Conducting qualitative research can assist in understanding issues that may not have been covered within this current study, as participants would be able to provide a comprehensive understanding of their own world views (Creswell & Poth, 2016).

Outside of recommended future research, some recommendations must be made to ACOs based upon the findings of this study. It is important for ACOs to review their current structure to ensure that they are continuing to be efficient. For example, previous research had highlighted how it is not necessarily the size of the ACO that can be problematic, more so the way it is structured (Aoun, 2018). Therefore, by ACOs reviewing their structure, it can assist in maintaining higher efficiency levels and great quality of care of patients (Aoun, 2018). It is also recommended for ACOs to review efficiency, financial performance, and quality scores during the COVID-19 pandemic. Previous research has highlighted how ACOs are experiencing more risks due to the pandemic (Bakshi et al., 2021); therefore, they should work at examining their structure to ensure that patients, medical doctors, nurses, specialists, and all other stakeholders are experiencing continuous movement and care within the organization.

Implications for Professional Practice and Social Change

The results of this current study have implications for professional practice and social change. The first implication is in relation to the first finding that that there is a statistically significant relationship between ACO efficiency and ACO financial

performance in ACOs in the states of Texas and Florida when controlling for shared savings plan, the investment model, the advanced payment model, total inpatient expenditures, total outpatient expenditures and location. When it comes to financial performance, the results of this study showed that, in Florida, there was a lower prediction of total inpatient expenditures, whereas Texas demonstrated lower inpatient expenditures. Additionally, the researcher concluded that ACOs that show an increase in financial performance will more than likely show an increase efficiency. Therefore, it is important ACOs to work on increasing their financial performance and efficiency levels together, as efficiency and financial performance appear to go together. Reviewing policies and procedures can be beneficial, especially within the landscape of COVID-19, which can ensure that ACOs' structures are sufficient and operating at their maximum.

In relation to the second finding there are also some implications to discuss. The second finding demonstrated that there was not a statistically significant relationship between ACO efficiency and ACO quality of care in ACOs in the states of Texas and Florida when controlling for shared savings plan, the investment model, the advanced payment model, total inpatient expenditures, total outpatient expenditures and location. The results identified that ACOs that have higher efficiency levels have significantly lower odds of being high quality. Therefore, it is important that ACOs develop or update policies and procedures to ensure of their efficiency and the continued levels of quality of care. By updating protocols and quality of care policies and procedures, ACOs can continue working on ensuring that their patients are provided high levels of quality of care, while simultaneously increasing their efficiency levels. Because previous

researchers found that it was not the size of the ACO, more so the structure that could affect quality of care, reviewing policies and procedures can help ensure that patients experience services they require in a timely manner, as well as at high quality levels. Within this arena, ACOs should better understand how COVID-19 has impacted them, which can assist them in remaining efficient during the overburdened patient care during the pandemic.

This study's results can also influence social change. By increasing efficiency levels and financial performance, patients and their wider community can be offered more robust services. This in turn can allow ACOs to ensure that the community are receiving affordable and efficient medical care. Therefore, by following these recommendations and working to better understand how COVID-19 has impacted these areas, ACOs can experience the benefits of increased financial performance and efficiency for their communities.

Conclusion

The purpose of this quantitative study was to examine the relationships between ACO efficiency, ACO financial performance, and ACO quality scores in the states of Florida and Texas. Guided by structural contingency theory, the research questions asked if there was a statistically significant relationship between efficiency and financial performance, as well as efficiency and the quality of care among ACOs in the states of Texas and Florida in 2018 using all ACOs located in the states. Data were drawn from the CMS shared savings program (SSP) ACOs dataset that provides 2018 composite scores and total benchmark expenditures in relation to ACOs located in the states of

Florida and Texas. The results showed that there is a statistically significant relationship between ACO efficiency and ACO financial performance in ACOs in the states of Texas and Florida when controlling for shared savings plan, the investment model, the advanced payment model, total inpatient expenditures, total outpatient expenditures and location. However, the results also revealed there was not a relationship between ACO efficiency and ACO quality in ACOs in the states of Texas and Florida when controlling for shared savings plan, the investment model, the advanced payment model, total inpatient expenditures, total outpatient expenditures, Texas, and Florida.

This chapter provided an interpretation of the study's results while also discussing limitations, recommendations, and implications. Due to the results, it was recommended that ACOs work to review their policies and procedures, as the results highlighted that when it comes to financial performance, in Florida there were a lower prediction of total inpatient expenditures, whereas Texas demonstrated lower inpatient expenditures. Additionally, the results concluded that ACOs that show an increase in financial performance will more than likely show an increase high efficiency. Yet, ACOs that have higher efficiency levels have significantly lower odds of being high quality. By reviewing current policies and procedures, structure, and current quality of care levels within the organizations, ACOs can be there to ensure that they offer robust medical services and high levels of quality of care for their community members.

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