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Investigation of California Physician-Owned Hospitals Profitability and Payor Mix Compared to  
Other Hospital Ownership Types: 2009 to 2015

By

James E. Pinder

Claremont Graduate University

2020

## APPROVAL OF THE DISSERTATION COMMITTEE

This dissertation has been duly read, reviewed, and critiqued by the Committee below, which hereby approves the manuscript of James Pinder as fulfilling the scope and quality requirements for meriting the degree of Doctor of Philosophy.

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## Abstract

# Investigation of California Physician-Owned Hospitals Profitability and Payor Mix Compared to Other Hospitals Over Time

By

James Pinder

Claremont Graduate University: 2020

Scrutiny of physician-owned hospitals (POHs) intensified beginning in 1989 and continued until passage of the Patient Protection and Affordable Care Act of 2010 (ACA). Government studies attempted to better understand the allegations that POHs were exploiting the whole hospital exception in the Stark laws by primarily accepting the healthiest patients with the best insurance (cream skimming or cherry picking) while avoiding sicker, less well insured patients.

The ACA prevented new POHs from opening and existing ones from expanding. With *California v. Texas* being decided by the US Supreme Court in 2021, the ACA, including the provisions regarding POHs, hangs in the balance. What has happened to POHs in California since passage of the ACA? How do POHs compare to other hospitals in California?

Employing quantitative methods with data from California's Office of Statewide Health Planning and Development, POHs were compared to two other groups of hospitals: investor-owned, and non-profit, using the metrics of net income margin percentage and low-reimbursing insurance payor mix, for the time period 2009-2015.

The results indicate there are no statistically significant differences between POHs and other hospitals ownership types when considering net income margin percentage. There are statistically significant results between POHs and other hospital ownership groups in low-reimbursing insurance payor mix.

The conclusions from this study include a call to action for policymakers to consider the value of POH restrictions regardless of the outcome in the US Supreme Court case *California v. Texas*.

*Keywords:* hospital, physician owned, specialty, health services, affordable care act, supreme court

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## **Chapter 1: Overview of this Study**

Prior to passage of the Patient Protection and Affordable Care Act of 2010 (ACA), it was alleged that physician-owned hospitals (POHs) were operating in ways that were unfair to other hospitals. Opponents claimed they cream skimmed patients (only accepting the ones with the best insurance, or ones that were the healthiest). Physician self-referral occurs when a physician refers their own patient for additional care or services to a business entity in which they have financial ownership or interest. The logic was that if physicians were self-referring, they would only accept the most lucrative patients and avoid the ones with lower reimbursing or no insurance. They might also prefer to choose the patients that were relatively healthy and avoid the sicker ones. It was alleged that physicians who self-refer would benefit unfairly from this practice. It was also alleged that physicians would order unnecessary tests to build up the reimbursement in a fee-for-service payment model. As physician owners, greater reimbursement from insurance means increased profits for the hospital and their owners. The studies by the government and others look carefully at these allegations and will be discussed later in the literature review.

One small provision of the ACA was designed to halt the opening of new physician-owned hospitals (POHs) or expansion of existing POHs. The logic was that POHs were harmful and unfair to other hospitals and the healthcare system and this harm needed to be mitigated. Since 2010, when the ACA was passed, no known new POHs have been opened or expanded in compliance with the ACA.

The literature review will describe how POHs are similar and different from other hospitals. Hospitals provide different types of services and attract different patient populations

who have various types of health insurance. Hospitals also perform at different financial levels and have different ownership structures, which affect how they operate.

The purpose of this study is to address some of the allegations regarding POHs. POHs will be compared to other hospitals in California to discern if they have a different patient insurance mix and a different level of profitability from 2009-2015. This encompasses the pre- and post-ACA time periods. While many provisions of the ACA were implemented in stages after President Obama signed it in March 2010, the portions affecting POHs became effective in March 2010 for existing POHs and December 2010 for those under construction (Cole, 2013). POHs will be compared to two other groups of hospitals: investor-owned hospitals, and non-profit hospitals. Non-profit hospitals include government operated hospitals (district, county, and state hospitals). Both government and non-profit hospitals serve the community without having a profit motivation. Many government hospitals are classified as safety-net and receive a significant amount of their reimbursement from Medi-Cal. They rely on public subsidies such as Medicaid Disproportionate Share Hospital payments (DSH). However, the services they offer are similar to other hospitals. Investor-owned hospitals are a logical comparison group because their profit motives are the same as POHs. Non-profit hospitals are also a suitable comparison group because it encompasses all the other hospitals that are not investor-owned.

In addition to comparing POHs to other groups of hospitals, individual groups of hospitals were analyzed over time to show trends of how various types of hospitals changed from 2009 to 2015. For instance, POHs profit margins were analyzed over time to determine if they had grown weaker, stayed the same, or grown stronger over time. This was done for non-profit hospitals and investor-owned hospitals.

In other studies that were national in scope or specific to one state, POHs have been compared to other hospitals at a specific point in time or for specific disease states (Plummer 2016). Other studies have analyzed patient payor mix as it relates to Medicare or Medicaid, but not the entire basket of insurance types (Blumenthal, 2015). The other studies have not considered the phenomenon of payor mix and profit margin over time, using specific metrics of payor mix and profit margin. The purpose of this study is to describe the characteristics of POHs in California, to empirically assess the patient payor mix, and to analyze the profit margin of POHs compared to other hospitals in California for the period of 2009-2015.

### **Significance and Timeliness of this Study**

This study can help guide policymakers as they decide how to proceed if the ACA is dismantled by the Supreme Court. Should the ACA's provisions affecting POHs be rendered mute, politicians will be bombarded by lobbyists seeking to protect their clients and advance specific agendas. It would seem likely that trade organizations representing acute care hospitals, investor-owned hospitals, and physician-owned hospitals would see opportunities and threats. Politicians would be wise to seek unbiased research, policy briefs, and data from sources that can help them decide what is best for healthcare consumers, not just healthcare providers.

The United States Supreme Court has accepted the case challenging the ACA (see literature review), a decision will be reached by 2021. This study will investigate POHs in California from 2009-2015. When subsequent data is released by OSHPD, similar research methods can be employed to update the findings.

Should the Supreme Court's decision in 2021 not affect the operations of POHs and leave intact the existing regulations, this study can help policymakers better understand how POHs fit into the California healthcare system. Attempts by those wanting to relax regulations on POHs

will need to be answered. Having a clearer understanding of POHs in California and how they relate to other hospitals will allow policymakers to make better informed decisions.

## **Chapter 2: Literature Review**

The literature review begins with a description of hospital characteristics in the United States. It describes the types of hospitals available to patients by the services they provide and their ownership structures. This review also shows trend data on the number of hospitals in the United States. Hospitals receive reimbursement from different types of insurance. This data is presented over a period to show the trend. Hospitals must remain solvent to stay operational. This data is presented for similar period as the insurance reimbursement data. The literature review continues with a definition of POHs, how are they different from many other hospitals, and how they are similar.

The literature review presents, in chronological order, the allegations, political background, government studies, legislation, regulation, and lawsuits pertaining to POHs in the United States. From the studies that were conducted by the government and non-governmental entities, we will learn what was discovered about POHs and what remains unknown. Two major studies are presented along with a systematic review.

### **Hospitals in the United States**

Hospitals in the United States can be described by the services they provide. There are two main categories: general and specialty. General hospitals provide a wide range of services to their patients including surgical procedures and general medical procedures and care. Specialty hospitals focus on one disease state or process, such as cardiac, orthopedic, or psychiatric care (McCarthy, 2012).

The number of hospitals in the United States, as described in Table 1, has steadily increased from 2009 to 2017 (Elflein, 2019).

Table 1

*Number of Hospitals in the United States by Ownership Type 2009 to 2017*

	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>
<b>State/local government</b>	1,092	1,068	1,045	1,037	1,010	1,003	983	956	972
<b>Non-profit</b>	2,918	2,904	2,903	2,894	2,904	2,870	2,845	2,849	2,968
<b>For-profit</b>	998	1,013	1,025	1,068	1,060	1,053	1,034	1,035	1,322
<b>Total</b>	<b>5,008</b>	<b>4,985</b>	<b>4,973</b>	<b>4,999</b>	<b>4,974</b>	<b>4,926</b>	<b>4,862</b>	<b>4,840</b>	<b>5,262</b>

Hospitals can also be described by their ownership structure. Federal hospitals are operated and regulated by the federal government under the supervision of the Department of Health and Human Services, Veterans Health Administration, and the Department of Defense (Liu, 2018). There are nonfederal government hospitals that are operated by city, state, or county governments. California has an additional type of nonfederal government hospital called hospital districts. These are a form of local government control of hospitals (Taylor, 2006). Among the nongovernment hospitals, there are two types: non-profit and investor-owned (for-profit). The biggest difference between these two types is what they do with their profits. Non-profit hospitals reinvest the funds into their own infrastructure. For-profit hospitals do the same and pay dividends to shareholders (McCarthy, 2012).

Hospitals can also be categorized by who can gain access to them. Community hospitals are open to the public while non-community hospitals are only accessible to certain populations of individuals. An example would be Veterans Administration hospitals, which are only open to members of the military and their families. Community hospitals make up 85% of hospitals in



the United States and can include hospitals that specialize in specific kinds of care such as for children or rehabilitation (Shi, 2019).

Finally, hospitals can be categorized as teaching and non-teaching. A teaching hospital is one that is a training facility for medical students and medical residents. It can be a non-profit, for-profit, or government operated. To further designate a teaching hospital that has a medical school, hospital, and university associated with it, the term academic medical center is applied (Shi, 2019).

Hospitals in the United States earn most of their revenue from health insurance payments provided for treating patients. Different insurance types reimburse at different rates for the same services. The highest reimbursing insurance is private coverage, which is greater than Medicare (Masterson, 2017). The poorest reimbursing insurance is Medi-Cal, or Medicaid (Mcaskill, 2014). The combination of insurance types is known as the payor mix. This mix of patients with their associated insurance types can affect the profitability of a hospital. Later in the literature review, the results of POHs attempting to operate without accepting Medicare or Medicaid are presented. Trend data for payor mix in the United States indicates a trend of more patients having Medicare and Medicaid insurance, while private insurance is decreasing (AHA, 2016). This data, from the American Hospital Association (2016), described the payor mix of hospitals in the United States from 1980 to 2014. It is clear from this data (in Table 2) that Medicare and private insurance are a vital part of a hospital's payor mix as they represent most of the payor mix for any given year.

Table 2

*Payor Mix Percentage of All Hospitals 1980, 2000, 2014*

	<b>Medicare</b>	<b>Medicaid</b>	<b>Other Government</b>	<b>Private</b>	<b>Uncompensated</b>	<b>Non-patient</b>
<b>1980</b>	34.60	9.60	6.10	41.80	5.10	2.70
<b>2000</b>	38.30	12.80	1.40	38.70	6.00	2.80
<b>2014</b>	40.20	17.60	1.70	33.10	5.30	2.10

The ability of a hospital to stay operational is determined by its profit margin. It does not matter if a hospital is a non-profit, for-profit, government operated, community, or non-community hospital, it must bring in more money than it spends to take care of its patients. In the United States, profit margins for all hospitals has generally trended up from 3.6% in 1981 to 4.6% in 2000, and up to 8.3% in 2014 (Belk, 2020).

The definition of a physician-owned hospital is one where a physician has any amount of an ownership stake or investment interest. This does not include a physician owning shares of a hospital corporation that is publicly traded. POHs are in some ways no different from other hospitals, but in other ways they are very different. While they are permitted to provide the same services as other hospitals, many choose not to provide a comprehensive list of services (such as general hospitals). There are exceptions of course, but many have chosen to specialize in specific procedures (orthopedic or cardiovascular). POHs are investor-owned (for profit). At times they are entirely owned by physicians or they can be a collaboration between physicians and another group (either a non-profit or for-profit entity).

The literature does not specify which hospitals in the United States or California are POHs. Previous studies have used different methods to identify them. The method for identifying POHs are outlined later in this study.

## **Legal, Regulatory, Political History, and Studies of POHs: 1989 to 2010**

Concern in the 1980s grew that physicians were making money at the cost of government and taxpayers, in an unfair manner through the practice of self-referral (OIG, 1989). The federal government conducted a series of studies, starting in 1989 on various aspects of POHs. The first, by The Office of Inspector General found that when a physician had an ownership in an independent clinical lab, their patients received 34% more services from the clinical lab compared to other Medicare patients (OIG, 1989). These findings confirmed that physicians benefited financially from self-referring to their own clinical labs. The results were an extra \$28 million in Medicare spending in 1987. Congress reacted with a new law referred to as Stark I in 1989 (taking effect in 1992). Physicians were prohibited from referring their own patients to clinical labs in which they had an ownership interest. The goal was to prevent unnecessary billing to Medicare, and waste of taxpayer money.

The study conducted by the Office of Inspector General used claims data to determine referral patterns and their associated costs. This was one of the first attempts to determine if self-referral was causing undue expense for the government and taxpayers. While the amount of money that was deemed to have been wasted (\$28 million) seems paltry in today's dollars, it pointed the finger at an unfairness in the US healthcare system. It looked like physicians were gaming the system at the expense of the rest of the country.

The Office of the Inspector General also fielded two surveys. One survey went to physicians and one went to providers of Medicare Part B ancillary services. Approximately 50% of the claims for these services from 1986 were included. The response rates from physicians and service providers were very high, over 95%. The survey sample and response rates indicate a solid study design with good internal validity.

The Stark Laws (1990 and 1993) and their associated regulations continued to expand (Manchikanti, 2007). An exception to all these prohibitions is allowing physicians to have an ownership in the entire hospital, as opposed to ownership of a subdivision of the hospital (such as the clinical lab). This is known as the whole hospital exception. The assumption was that ownership in the entire facility (such as owning shares of an investor-owned hospital) would be diluted enough that self-referral would not be a significant conflict of interest or financial drain on the system. Even if a physician referred their patient to a hospital in which the physician owned shares, it would not significantly benefit the physician financially. This makes sense if one is considering a large comprehensive hospital that offers many levels of service. The outcome can change when one considers a physician referring a patient to a small specialty hospital in which the physician has an ownership stake.

Specialty hospitals usually treat only one or two specific conditions (cardiac and orthopedic specialties are very common). By 2003 there were growing concerns that the Stark Laws left a gap that allowed for physician-owned specialty hospitals to exist and drain the system of needed resources while enriching their physician owners. There were also concerns that these physician-owned specialty hospitals financially harmed other hospitals in the community by cherry picking (cream skimming) the patients that were the healthiest and most well insured.

The federal government studied the issue and found that since 1990 the number of specialty hospitals had tripled, yet they occupied only 2% of the market (GAO, 2003). This accounted for 1% of Medicare spending. They also found that 70% of specialty hospitals had physician ownership and tended to treat fewer sick patients compared to other community

hospitals. The study was not able to determine if treating fewer sick patients had a clinical or economic impact.

This study included 110 specialty hospitals divided into four categories. The hospitals were surveyed, and claims data was collected from the Healthcare Cost and Utilization Project data set to determine the severity of the patients being treated. The survey response rate was approximately 80%. This study represents a good combination of sample size and response rate. Because the study did not determine the clinical or economic impact of surgical hospitals, which treat fewer sick patients compared to other acute care hospitals, it is difficult to determine if the findings are actionable.

In 2003, Congress passed the Medicare Prescription Drug, Improvement, and Modernization Act (Congress, 2003). It included provisions related to physician-owned hospitals that placed an 18-month moratorium on a physician's ability to refer to a new specialty hospital in which they had an investment or ownership interest. Existing specialty hospitals were exempted. This effectively stopped opening new physician-owned hospitals until June 2005. The day after the ban expired, CMS suspended enrolling new physician-owned specialty hospitals until August 2006 (Levinson, 2008) as part of the Deficit Reduction Act of 2005.

The law also contained language which required a study by the Medicare Payment Advisory Commission (MedPAC) to study physician-owned specialty hospitals compared to local full-service community hospitals. The report was due to Congress in 2005. MedPAC was charged with studying the following aspects:

1. Referral patterns of specialty hospital owners
2. Quality of care and patient satisfaction

3. Differences in uncompensated care
4. Relative value of tax exemptions available to community hospitals

From 67 physician-owned specialty hospitals, MedPAC chose 11 for their sample. They compared them with competitor academic medical centers and community hospitals that were no more than 20 miles away (comparison group). Many leaders at these hospitals were interviewed to triangulate the data. Historical data was also collected from the Internal Revenue Service and Agency for Healthcare Research and Quality. And finally, patients were interviewed to assess satisfaction (Leavitt, 2005).

The study found that specialty hospital physician owners referred to their own facilities at a high rate. This is considered normal because physicians tend to refer most of their patients to a single facility, even if it is an academic medical center or a community hospital. The study also found that physician-owned specialty hospitals provide a high level of quality care when considering readmission rates, complication rates, and mortality rates (Leavitt, 2005). For example, the study calculated inpatient quality indicators for four specific procedures: abdominal aortic aneurysm repair, coronary artery by-pass graft, Percutaneous Transluminal Coronary Angioplasty, and carotid endarterectomy. The observed/expected mortality rates were less than one, which indicates good outcomes. The mortality rates of specialty hospitals compared to their competitors also showed observed/expected ratios of less than one. Physician-owned hospitals provide quality care to their patients.

The topic of uncompensated care was challenging because community hospital leaders argued they took care of the least-insured patients (Leavitt, 2005). MedPAC determined that the amount of money paid in taxes by physician-owned specialty hospitals exceeded the value of uncompensated care provided by other hospitals. Using the value of uncompensated care among

non-profit hospitals compared to the community benefit (taxes paid) by specialty hospitals, the study found that not-for profits provided uncompensated care at the rate of 0.87% compared to a net community benefit of 3.74% for cardiac hospitals and 7.23% for orthopedic/surgery hospitals (Leavitt, 2005). This showed that physician-owned hospitals were not a drain on community resources, but an asset.

Looking at the study, the challenge MedPAC had with studying physician-owned hospitals remains today. Who and where are the physician-owned hospitals? The organization, Physician Hospitals of America, does not share its membership list with the public. If one were to join their organization, the membership list would be available. However, it only lists the hospitals that have joined, not an exhaustive list. Thus, MedPAC did their best to identify a comprehensive list of physician-owned hospitals from which to choose a sample. The number of hospitals selected was geographically diverse but small. From 67 POHs, they studied 11 hospitals. This is a very small sample size and is most valuable as a series of case study examples. This study does not seem adequate to provide actionable data for Congress because of the small sample size. However, when combined with the previous government studies, it helped paint a picture from which Congress could act.

In 2006 the Office of Inspector General conducted a survey of community hospitals to determine how they were reacting to the presence of a specialty hospital in their regions (Steinwald, 2006). They surveyed 600 hospitals (some had a specialty hospital in their market, and some did not) and 401 responded. It was thought that community hospitals with a specialty hospital in their market might be making competitive responses as a result (Steinwald, 2006). All responding hospitals were making changes to their services to remain competitive. There was little data to suggest specialty hospitals influenced these competitive changes. This study

was broader and shallower compared to the MedPAC study but had important findings. Were community hospital leaders worried about POHs to the degree that they would make market moves? It appears the answer is no.

The presence of specialty hospitals encourages other general acute care hospitals to become more efficient and competitive (Steinwald, 2006). More competition is generally better for patients and payors in many areas of business. This study concluded that while general acute care hospitals (both rural and urban) were making a lot of changes to remain competitive, none of them appeared to be related to the presence of specialty hospitals (Steinwald, 2006).

The 2006 OIG study concluded that specialty hospitals occupy a small part of the marketplace and that they do not have a large impact on healthcare markets either negative or positive. This result makes specialty hospitals appear to be benign and less threatening. While it does not justify expanding the presence of specialty hospitals it should not prevent it either.

Physician-owned specialty hospitals face challenges in managing medical emergencies (Levinson, 2008). While there was not concern about the quality of medical care in these facilities when it came to procedures (according to the MedPAC study), when two patients died after routine procedures, notice was taken by the federal government (Levinson, 2008). In both cases the physician-owned hospitals called 9-1-1 and the patients were sent to community hospitals, where they were pronounced dead. In January 2008, the Inspector General released a report on this topic.

The Office of Inspector General's findings are quoted below:

1. "About half of all physician-owned specialty hospitals have emergency departments, the majority of which have only one emergency bed."



2. “Not all physician-owned specialty hospitals had nurses on duty and physicians on call...”
3. “...less than one-third of physician-owned specialty hospitals have physicians onsite at all times.”
4. “Two-thirds of physician-owned specialty hospitals use 9-1-1 as part of their emergency response procedures.”

This study was conducted from a potential list of 130 POHs. From this list, the Office of Inspector General narrowed it down to 109 hospitals that met their definition of having one physician owner. Each of these hospitals were surveyed on their staffing levels based on eight selected days. Hospitals administrators were also surveyed by telephone. There was a 100% response rate to these surveys and the telephone interview. This study suffered from the same challenge that affects all such studies: no comprehensive list of POHs exists.

A series of recommendations were made to the Centers for Medicare and Medicaid (CMS) relating to the need for physician-owned hospitals to be identified and tracked, have a nurse on duty at all times, a physician on-call at all times, and have procedures that don't rely on calling 9-1-1 in case of an emergency.

This study mentioned an ongoing challenge that is still faced today: no one knows exactly who and where the physician-owned hospitals are located. CMS does not track this information. In California, the California Hospital Association and California Department of Public Health do not track this information either.

## **Legal, Regulatory, Political History, and studies of POHs: 2010 to Present**

When the Affordable Care Act (ACA) passed Congress and became effective (Strokoff, 2010), it was heralded by some and loathed by others. Of little notice to most healthcare consumers was the restriction placed on physician-owned hospitals. The ACA forbade new POHs from billing Medicare. Medicare billing is the lifeblood of a hospital. While private insurance reimburses at a higher rate than all other insurance types, many patients have Medicare and hospitals rely on these revenue streams to survive. Several POHs opened after 2010 in Texas, not accepting Medicare reimbursement, and they have either failed or were in the process of failing (Plummer, 2016). The ACA was designed to reduce self-referral, cherry picking (or cream skimming), and failure to provide community benefits by POHs.

It is interesting to note that physician-owned hospitals were not completely banned. Their alleged bad behavior could continue, but the impact would be blunted. They could remain competitive in the marketplace by offering new services, changing their business model (selling their business), but they could not expand. There was a way to obtain permission for expansion that will be discussed later.

In the ACA's 974 pages, one of controversial section dealt with the requirement to purchase health insurance known as the individual mandate (Internal Revenue Service, 2012). With limited exceptions, taxpayers had to purchase health coverage or face a penalty. If everyone is required to purchase health insurance, the risk is spread out and adverse selection is minimized. Adverse selection is where only sick people purchase health insurance because they know they need it. The younger, healthier population avoids purchasing health insurance because they do not think they will need it. If only the sick patients have health insurance, it

becomes very expensive. This concept of a penalty for failure to purchase health insurance became the focal point of the first case to be heard by the Supreme Court on this legislation.

The government argued that they were justified in assessing a penalty (through IRS regulations) for failing to purchase health insurance under the interstate commerce clause of the US Constitution. The outcome was a win for the government, but a rejection of their argument (Liptak, 2012). In the 5-4 decision, with the swing vote being Chief Justice John Roberts, it was determined that the actions of the government were lawful, but that it was not a penalty or fee but a tax. And Congress has the authority to levy taxes so the critical component of the ACA, the individual mandate, stood firm.

Since passage of the Affordable Care Act, there have been several non-governmental studies of POHs. Two of the studies will be presented along with a systematic review of 46 studies. One study was national, the other focused on a single state. Earlier in this literature review several governmental studies were presented and discussed. These were instrumental in POHs restrictions being placed in the Affordable Care Act. The studies were published in 2014, 2015 and 2016 and paint a picture of POHs after passage and implementation of the ACA. After presenting the three studies, the literature review will continue with the legal challenges to the ACA.

The national study from 2015 is titled “Access, quality, and costs of care at physician owned hospitals in the United States: observational study” (Blumenthal, 2015). It was a large observational study consisting of 219 POHs and 1967 other hospitals. This sample was close to being a census as it contained nearly a comprehensive list of hospitals spread across 95 referral regions. The study, from 2010, compared POHs to other hospitals, along the patient dimensions of Medicaid status and race/ethnicity as well as hospital performance, readmission rates, the cost

of care, Medicare market share, and 30-day mortality rate. The statistical tests used were chi-square, independent samples t-test, and linear regression models.

This study at whether POHs were cherry picking (cream skimming) the most well-insured or healthiest patients while avoiding those that were poorly insured or sicker. While it is true that a well-insured patient may be very sick, or a healthy patient may be poorly insured, the concept of cherry picking and cream skimming refers to the allegation that a POH would seek the greatest reimbursement (well insured patients) or the best outcomes (healthiest patients) patients at the expense of those that are sicker or poorly insured. The allegation also means that POHs would avoid patients that are likely to produce less desirable outcomes or not maximize reimbursement. This study also investigated if there were racial or ethnic disparities of the patients between POHs and other acute care hospitals, and if there were increased utilization rates with POHs hospitals. POHs were alleged to be ordering tests or procedures that were unnecessary and increased reimbursement at the expense of taxpayers (OIG, 1989). Their sources of data were Physician Hospitals of America, The American Hospital Association, and Medicare claims data.

The conclusions of this study were that POHs did treat slightly healthier patients. The number of patient comorbidities was 1.6 for POHs and 1.8 for non-POHs (Blumenthal, 2015). The study found that POHs did not avoid patients with low-paying insurance (Medicaid). The percentage of POHs patients with Medicaid was 14.9% compared to 15.4% for non-POHs (Blumenthal, 2015). And POHs did not shun patients from ethnic or racial minority groups. POHs patients were 5.1% black compared to 5.5% black for non-POHs (Blumenthal, 2015). The quality of care between the two groups of hospital were very similar. POHs patient experience scores were 74.3% compared to 74.9% for non-POHs. And the mortality rates were within 0.1%

of each other. The differences between POHs and other hospitals were small. This study recommended that restrictions on POHs be re-evaluated to see if they are still necessary because the allegations against POHs appeared to be overblown (Blumenthal, 2015) as they may not be necessary.

This study appears to be generalizable to hospitals across the United States because the sample was taken from across the entire country and includes almost all acute care hospitals, surgical hospitals, and POHs. It answers the major questions brought forward by the authors of the Affordable Care Act relating to POHs cherry picking (cream skimming) the best patients at the expense of other hospitals.

In this study, they weighted their linear regression models for discharges, hospital size, referral region, geographic setting, profit status, and teaching status. This helped isolate the relationships between the independent and dependent variables (Blumenthal, 2015).

The second study focused on Texas and was titled “The Affordable Care Act’s Effects on the Formation, Expansion, And Operation of Physician-Owned Hospitals” (Plummer, 2016). It analyzed hospitals’ response to implementation of the Affordable Care Act and afterward. The sample consisted of 106 POHs and were compared to 163 for-profit (non-physician owned) hospitals. This sample was close to a census of POHs and investor-owned hospitals in Texas. It is not clear how so many POHs were identified for this study. Using other for-profit hospitals as a comparison group made sense because both groups were profit-seeking and would have similar business motivations. This study estimated there were 240-275 POHs in the United States. Texas has a very large number of POHs, and this sample represents about 40% of POHs across the nation (Plummer, 2016). The empirical methods of this observational study included independent samples t-test and linear regression models. It analyzed various metrics for

profitability. The Plummer study also considered the use of assets such as number of surgeries per operating room and revenue per square foot or full-time equivalent employee. This data was analyzed for the time period 2008-2012, representing the pre- and post-ACA time periods.

In 2010, prior to the deadline for new POHs to open and avoid the ACA restrictions, 20 new POHs opened in Texas (Plummer, 2016). This is compared to 63 opening in the period of 2004-2009. What happens if a new POH opens after 2010 and does not accept Medicare or Medicaid? The answer is a disaster for those institutions. From 2011-2013, nine POHs formed in Texas and did not accept Medicare or Medicaid. All have either been sold or were in bankruptcy when this study was published (Plummer, 2016). The study concludes that the Affordable Care Act was successful in its goals of stopping the formation of new POHs or allowing existing ones to expand. The study shows that POHs in Texas that were opened prior to passage of the ACA were able to survive, and thrive, even with the restrictions placed on them by the Affordable Care Act. Net mean revenue per adjusted patient day for POHs was \$2,710, compared to \$1,201 for non-POHs (Plummer, 2016).

This study is not generalizable to the entire United States because the sample included only hospitals in Texas. The methods were rigorous and included variables in the regressions to account for between-site differences including size (log of admissions), accountable care organization participation, and designation of a specialty hospital. This helped isolate the relationships between the independent and dependent variables (Plummer, 2016).

The systematic review analyzed 46 studies, using the metrics of care from the Institute of Medicine's quality framework. They concluded that limited evidence existed to support the concept that POHs provided advantages, or that POHs impacted other hospitals in a negative

way (Trybou, 2014). They recommended that POHs continue to be monitored because the evidence they found was not consistent or cohesive.

When Donald Trump became President, he began an effort to repeal and replace the ACA. Progress came with passage of the Tax Cuts and Jobs Act of 2017 (Congress, 2017). One provision of this new law reduced the penalty of the individual mandate to \$0. This law set in motion the judicial proceedings that threaten to undo the ACA in its entirety.

Texas and other plaintiffs brought an action against the government arguing that with passage of the Tax Cuts and Jobs Act of 2017, with the individual mandate tax being reduced to \$0, the individual mandate is unconstitutional both under the interstate commerce clause of the Constitution and Congress' authority to tax (O'Connor, 2018). The plaintiffs also argued that if the individual mandate were unconstitutional, it was not severable from the remainder of the law and thus the entire ACA should be unconstitutional. Justice O'Connor agreed with the plaintiffs and ruled that the individual mandate was unconstitutional and further that it was inseverable from the rest of the ACA. Thus, the entire law was unconstitutional.

Not much was made of this district court ruling as the outcome would be appealed and decided by the 5<sup>th</sup> Circuit Court of Appeals. This new case was more important because its decision could be appealed to the Supreme Court. The outcome surprised people on both sides of the aisle (Yood, 2019). It was determined in a split decision that the individual mandate was unconstitutional (King, 2020). The portion legal experts wanted to know was whether it was severable from the remainder of the law. The 5<sup>th</sup> Circuit Court of Appeals sent the case back to the District Court for reconsideration. This made little sense as the appeals court could, and probably should have made that decision. The District Court will likely come to the same

conclusion they did originally, as the same judge is presiding. It is likely this case will still end up before the Supreme Court, but it will take longer than originally imagined.

If the Supreme Court ruled that the individual mandate is not severable, and the entire ACA falls, one portion of interest to this study is the prohibition on new POHs and the expansion of existing POHs found in section 6001 of the Compilation of Patient Protection and Affordable Care Act (Strokoff, 2010). What should happen to physician-owned hospitals should the entire ACA be deemed unconstitutional?

The case took a turn in March 2020 when the Supreme Court agreed to hear it, prior to the District Court being able to review what was returned to them by the 5<sup>th</sup> Circuit Court of Appeals. The State of California and the US House of Representatives intervened on behalf of the Affordable Care Act because the federal government was not defending it (Musumeci, 2020). The 5<sup>th</sup> Circuit Court of Appeals accepted their application for intervenor status. The intervenors appealed to the Supreme Court for expedited processing but was denied. They argued that the impact and uncertainty to the healthcare of Americans in this case necessitated that the case be heard this term. However, the case was accepted by the Supreme Court for the following term and oral arguments were heard November 10, 2020. It will not be decided until 2021. Because of the intervenor status of California (and several other Democratic states), the case has been consolidated and is now called California v. Texas (Howe, 2020).

## **Charity Care**

Charity care (a component of community benefit), which is required of non-profit hospitals by the ACA, has become a topic of interest to researchers. On a national scale, top earning non-profit hospitals provide less charity care than lower earning non-profit hospitals.



“...the top-earning quartile gave \$11.50 of charity to uninsured patients and \$5.10 to insured patients for every \$100 of net income. In comparison, non-profit hospitals in the third quartile of income gave \$72.30 of charity to the uninsured and \$40.90 to the insured for every \$100 of net income” (LaPointe, 2020).

In California, charity care has plunged from 2013 to 2015, likely because of implementation of the ACA in 2014 requiring everyone to have health insurance. The rate of charity care among all California hospitals dropped from just over 2% to just under 1% (Rowan, 2019). Because charity care is required of non-profit hospitals, it is not a dependent variable when comparing POHs to non-profit institutions.

### **Similarities with Other Studies and Uniqueness of this Study**

The proposed study is like Blumenthal (2015) in that it is observational and contains nearly a census of hospitals. Blumenthal’s sample came from across the United States, while this study is limited to California. The statistical tests to be run are also similar in the use of independent samples t-test and linear regression models. While Blumenthal focused on 2010, the proposed study encompasses data from 2009-2015.

This study is also like the research conducted in Texas (Plummer, 2016) in that it contains nearly a census of hospitals. The Texas research only focused on POH and investor-owned hospitals, while this study will include non-profit and government hospitals from California. Plummer (2016) used data from 2008-2012, a five-year span that is equally prior to and after the ACA was implemented in 2010. The proposed study encompasses a five-year timeframe as well but starts just prior to 2010 and stretches further past the ACA implementation in 2010.

While other studies in the literature review analyzed the phenomenon of cherry picking (cream skimming) by looking at POHs avoiding Medicaid patients or choosing healthier patients (Blumenthal, 2015), none have analyzed the entire basket of insurance options. This study seeks to clarify this question by considering nine types of insurance, broken into two categories (high- and low-reimbursing). Blumenthal (2015) only looked at data for a single year while Plummer (2016) analyzed data over a five-year period. The proposed study strengthens the Plummer approach by introducing statistical analysis that looks for relationships between the hospital groups with time as a factor. None of the other studies attempted this approach. Studying the dependent variables individually, and over time, adds to the knowledge about POHs and gives policymakers a clearer picture of these phenomenon in California.

## Chapter 3: Methods

### Research Questions

After reviewing the literature, the principal objective of this study is to assess what has been the effect of the ACA on California POHs? What has happened to California physician-owned hospitals from 2009-2015 (the period right before and several years after passage/implementation of the ACA)? The following two questions each contain two items. These questions address the main reasons the ACA contained provisions relating to POHs and their associated restrictions. By answering these questions, conclusions can be drawn regarding the need for further or continued regulation of POHs whether or not the ACA is dismantled by the US Supreme Court. The conclusions can also assist policymakers in future discussions about POHs should the US Supreme court not dismantle the ACA. Should the Supreme Court's decision in 2021 not affect the operations of POHs and leave intact the existing regulations, this study can help policymakers better understand how POHs fit into the California healthcare system. Attempts by those wanting to relax regulations on POHs will need to be answered. Having a clearer understanding of POHs in California and how they relate to other hospitals will allow policymakers to make better informed decisions.

1. Are physician-owned hospitals profit margins different than other hospitals? How have POHs profited over time compared to other hospitals?
2. Are physician-owned hospitals' payor mix different than other hospitals? How have physician-owned hospitals' payor mix changed over time compared to other hospitals?

## **Research Objectives**

The aim of this study is to investigate California Physician-Owned Hospitals profitability and insurance mix compared to other hospitals and to evaluate how these variables have changed over time. The specific objectives of the study are:

1. Describe the characteristics of hospitals in California
2. Empirically assess the profitability of physician-owned hospitals compared to other hospitals in California for each year and over time.
3. Evaluate the payor mix of physician-owned hospitals compared to other hospitals in California for each year and over time.

## **Sample**

Data was downloaded from the Office of Statewide Health Planning and Development website in the form of Excel spreadsheets for the years 2009-2015. This data categorized hospitals as non-profit, investor-owned, or government. The umbrella term investor-owned contains both POHs and other for-profit hospitals. Hospitals were coded with identifiers so they could be sorted by ownership type. The number of POHs in California compared to all other hospitals in California is not a published list or statistic. By analyzing and researching all investor-owned hospitals, it is estimated a high proportion of POHs have been identified. It is possible some POHs remain unidentified and would thus remain in the pool of investor-owned hospitals. From 2009 to 2015, there were approximately 530 hospitals in California. There were between eight and 11 POHs. It is possible some hospitals did not submit data to OSHPD. If this is true, these hospitals will not be included in the study.

From the OSHPD data (2020), many variables were available. Variables were selected or rejected based on the literature review, to avoid redundancy, and to minimize collinearity. A comprehensive list of available variables is listed in Appendix A, their type, and whether their values were available or computed. Table 3 lists the variables that were selected for this study.

Table 3

*List of Variables Used in this Study*

<b>Variable</b>	<b>Type</b>	<b>Available or Computed</b>
Hospital Ownship Type	Categorical	Available
Teaching Status	Categorical	Available
Low-Reimbursing Insurance Payor Mix	Continuous	Computed
Licensed Beds	Continuous	Available
Licensed Beds Occupancy Rate	Continuous	Available
Average Length of Stay	Continuous	Available
Net Income Margin	Continuous	Available
Charity % of Operating Exp	Continuous	Available

The data was combined and organized so it could be analyzed with Statistical Package for Social Sciences (SPSS) version 25 and Stata version 15. To prepare the data for analysis, it was first checked for alignment to ensure the importation process was done successfully. Next, the variables used in this study were checked for their correct coding. If a variable was dichotomous or categorical, the type was set to string and the measure set to nominal. If it was continuous, the type was set to numeric/percentage, and the measure set to scale. Data cleaning involved identifying data entry errors such as a negative number of hospital beds. These values were removed. To check for outliers, frequencies were computed with box plots. If outliers were determined to be legitimate observations, they were included. If they were not legitimate observations (data entry errors), they were removed. In the process of standardizing the

coefficients in the random effects regression models, the hospitals with missing data were removed for those specific calculations.

Skewness was checked by analyzing the data for each variable. The skewness scores for the variables ranged from normally distributed (-0.5 to +0.5), moderately skewed (-1 to +1), to highly skewed ( $< -1$ ,  $> +1$ ). To improve the results, non-parametric tests were conducted and compared to parametric tests. The one-way between groups ANOVA (Tables 5, 9) and Kruskal-Wallis H Test (Appendix C) results are very similar. Because the non-parametric tests did not improve the results, parametric tests were used in this study.

For the fixed effects regression models (see below), the data was organized in a vertical format as a panel (Andreb, 2017) and analyzed with Stata. A vertical format means the 2009 data was placed on the spreadsheet first, and subsequent year's data was placed underneath in order by year. To navigate through the data, one would scroll down or up, in a vertical fashion. For all the remaining statistical analysis, the data was organized in a horizontal format and analyzed with SPSS. A horizontal format means the 2009 data is placed on the spreadsheet first, and subsequent year's data is placed to the right in order by year. To navigate through the data, one would scroll right and left, in a horizontal fashion.

### **Measurement of key constructs**

The methods employed for this study are quantitative. The dependent variables that were analyzed are as follows:

1. Net income margin percentage
2. Low-reimbursing payor mix percentage

The measure for analyzing profit margin will be net income margin percentage. It is a more comprehensive variable compared to the other profit margin data points (total margin, operating margin) because it accounts for taxes and interest and describes a more complete picture of the hospital's financial situation (Murphy, 2019). This is important when looking at POHs and other for-profit hospitals because they pay property taxes and corporate income taxes. Operating profit margin is a key performance indicator advocated by some (Maverick, 2018), but it does not account for taxes and interest.

The measure for analyzing payor mix is percentage of payors from all possible options. In the data set are nine insurance types: Medicare, Medi-Cal, private coverage, workers' compensation, county indigent programs, other government, other indigent, self-pay, and other payor. The insurance types will be grouped as follows: low reimbursing: Medi-Cal, county indigent, other government, other indigent, self-pay, and other payor; high reimbursing: Medicare and private coverage. Workers' compensation was excluded.

Two independent variables which will be initially controlled for, based on the independent variables available in the data sets from OSHPD, and which were controlled for in the other studies, are hospital size (number of beds) and teaching status (Blumenthal, 2015 and Plummer, 2016). In addition to controlling for hospital size and teaching status, other relevant available independent variables from the data set will be reviewed using correlation analysis and included in random effects regression models if they are statistically significant.

### **Data analysis and answering the research objectives**

**Describe the characteristics of hospitals in California.** Data visualizations and analysis will provide an overview of the characteristics of California hospitals as they relate to ownership

type: physician owned, investor-owned, and non-profit. Descriptive statistics such as frequencies, means and standard deviations will be computed for all study variables where appropriate.

**Empirically assess the profitability of physician-owned hospitals compared to other hospitals in California for each year and over time.** A one-way between groups analysis of variance (ANOVA) will be used to compare the mean net income margin percentage between POHs, investor-owned hospitals, and non-profit hospitals for each year between 2009 and 2015. If statistically significant results are obtained, post-hoc analysis (i.e. Tukey and Scheffe), will be used to determine the pairwise mean differences between the three hospital categories. This analysis allows for more than two groups to be compared to each other while still isolating statistically significant results. For this study, government hospitals were included with nonprofit hospitals during the statistical calculations. The statistical analysis was run with government hospitals as a separate category, but the results did not change.

Correlation analyses will be used to identify all variables that are correlated with net income margin. Spearman correlation will be used for those variables that are dichotomous and ordinal and Pearson for continuous variables. The variables that have statistically significant correlation with net income margin will be used in the regression analysis. If a variable was statistically significant in one year (2009-2015), it was included as a covariate to maintain consistency.

A random effects regression model will be used with panel data and analyzed to determine which independent variables are associated with the dependent variable net income margin percentage. A random effects model is appropriate because it estimates the effect of both time-invariant variables (hospital ownership) and time-variant variables (average length of stay



etc.) have on net income margin percentage. Standardizing the coefficients will result in fewer observations being included in the model. Non-profit hospitals will be used as the reference variable, allowing POHs and investor-owned hospitals to be compared to them. Considering the value of a coefficient assumes all other independent variables are being held constant. In a random effects regression model, r-squared is used to measure goodness of fit. However, it is not presented in this study because of a lack of credibility due to potential issues with heteroskedasticity, endogeneity, clustering, autocorrelation, unit root testing, and omitted variable bias etc. Multicollinearity is checked with the variance inflation factor (VIF).

A repeated measures ANOVA analysis will be conducted to determine if there are differences in the net income margin percentage means over time between the three hospital ownership types. This analysis contains tests for between subjects effects and pairwise comparisons between groups. This test is appropriate because it includes time as a variable and the effect can be measured as it relates to the different hospital groups.

**Evaluate the payor mix of physician-owned hospitals compared to other hospitals in California for each year and over time.** A one-way between groups analysis of variance (ANOVA) will be used to compare the mean low-reimbursing payor mix percentage between POHs, investor-owned hospitals, and non-profit hospitals for each year between 2009 and 2015. If statistically significant results are obtained, post-hoc analysis (i.e. Tukey and Scheffe), will be used to determine the pairwise mean differences between the three hospital categories. This analysis allows for more than two groups to be compared to each other while still isolating statistically significant results. For this study, government hospitals were included with nonprofit hospitals during the statistical calculations. As a sensitivity analysis the model was also run with government hospitals as a separate category, but the results did not change.

Correlation matrixes will be used to identify all variables that are correlated with low-reimbursing payor mix. Spearman correlation will be used for those variables that are normal and ordinal and Pearson for continuous variables. The variables that have statistically significant correlation with low-reimbursing payer mix will be used in the regression analysis. If a variable was statistically significant in one year (2009-2015), it was included as a covariate to maintain consistency.

A random effects regression model will be used with panel data and analyzed to determine which independent variables are associated with the dependent variable low-reimbursing pay mix percentage. A random effects model is appropriate because it estimates the effect of both time-invariant variables (hospital ownership) and time-variant variables (average length of stay etc.) have on low-reimbursing pay mix percentage. Standardizing the coefficients will result in fewer observations being included in the model. Non-profit hospitals will be used as the reference variable, allowing POHs and investor-owned hospitals to be compared to them. Considering the value of a coefficient assumes all other independent variables are being held constant. In a random effects regression model, r-squared is used to measure goodness of fit. However, it is not presented in this study because of a lack of credibility due to potential issues with heteroskedasticity, endogeneity, clustering, autocorrelation, unit root testing, and omitted variable bias etc. Multicollinearity is checked with the variance inflation factor (VIF).

A repeated measures ANOVA analysis will be conducted to determine if there are differences in the low-reimbursing payor mix percentage means over time between the three hospital ownership types. This analysis contains tests for between subjects effects and pairwise comparisons between groups. This test is appropriate because it includes time as a variable and the effect can be measured as it relates to the different hospital groups.

## Chapter 4: Results

The purpose of this chapter is to present the findings of the analysis conducted to answer the research objectives. The following research objectives were the basis for the analysis conducted during this study:

1. Describe the characteristics of hospitals in California
2. Empirically assess the profitability of physician-owned hospitals compared to other hospitals in California for each year and over time.
3. Evaluate the payor mix of physician-owned hospitals compared to other hospitals in California for each year and over time.

**Research objective #1.** Describe the characteristics of hospitals in California. The number of POHs in California has changed over time and ranged from 8 to 11 (Table 4). Other hospital ownership types have also changed over time, except for non-profits, which have remained constant. The period between 2009 and 2010 saw the greatest change in the number of POHs. The total number of hospitals has been very consistent between 530 and 531. POHs are between 1.5% and 2% of all hospitals in California (Table 4).

Table 4

*Frequency of Hospitals in the Sample by Ownership Type and Year*

	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>
<b>Physician-owned</b>	8	11	11	11	10	10	10
<b>Investor-Owned</b>	154	153	153	153	154	154	154
<b>Non-profit</b>	276	277	277	277	277	277	277
<b>Government</b>	92	90	90	90	90	90	89
<b>Total</b>	530	531	531	531	531	531	530

The tables in Appendix B describe California hospitals in relation to each other in the areas of patient payor mix, licensed beds, licensed beds occupancy rate, number of discharges, net income margin percentage, and percent of operating budget for charity care. The hospitals are grouped by ownership type. In the statistical analysis for this study, government hospitals are combined with non-profit hospitals. The number of hospitals reporting data varies. More hospitals report data relating to payor mix than do their characteristics or financial data.

From the tables in Appendix B, it is apparent that all hospitals rely heavily on Medicare and private insurance as part of their payor mixes (combined, they comprise greater than 50% of the payor mix). While other hospital ownership types remain relatively consistent, POHs have a higher rate of variability (ranges from eight to 11). POHs have the lowest levels of charity care, indigent patients, and the fewest number of beds.

This data from Appendix B, viewed graphically over time with trend lines (Figures 1-3), indicates that net income margin percentage (one of the dependent variables) is positive for POHs and investor-owned hospitals. However, the trend is negative for non-profit hospitals. Combining the three figures (Figure 4), shows the greater variability in POH net income margin, less variability for investor-owned hospitals, and relative stability (in a negative trend) for non-profit hospitals. This might be explained by the relatively low number of POHs and high number of non-profit hospitals.

Figure 1

*Net Income Margin Percentage Means for Physician-owned Hospitals, 2009-2015*

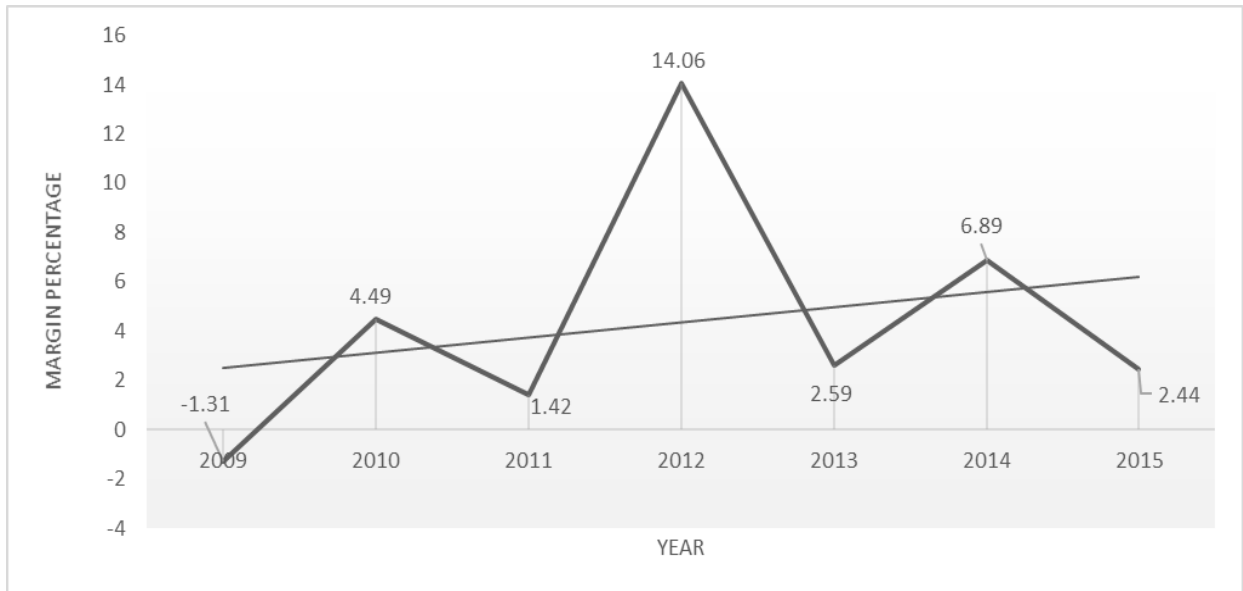


Figure 2

*Net Income Margin Percentage Means for Investor-owned Hospitals, 2009-2015*

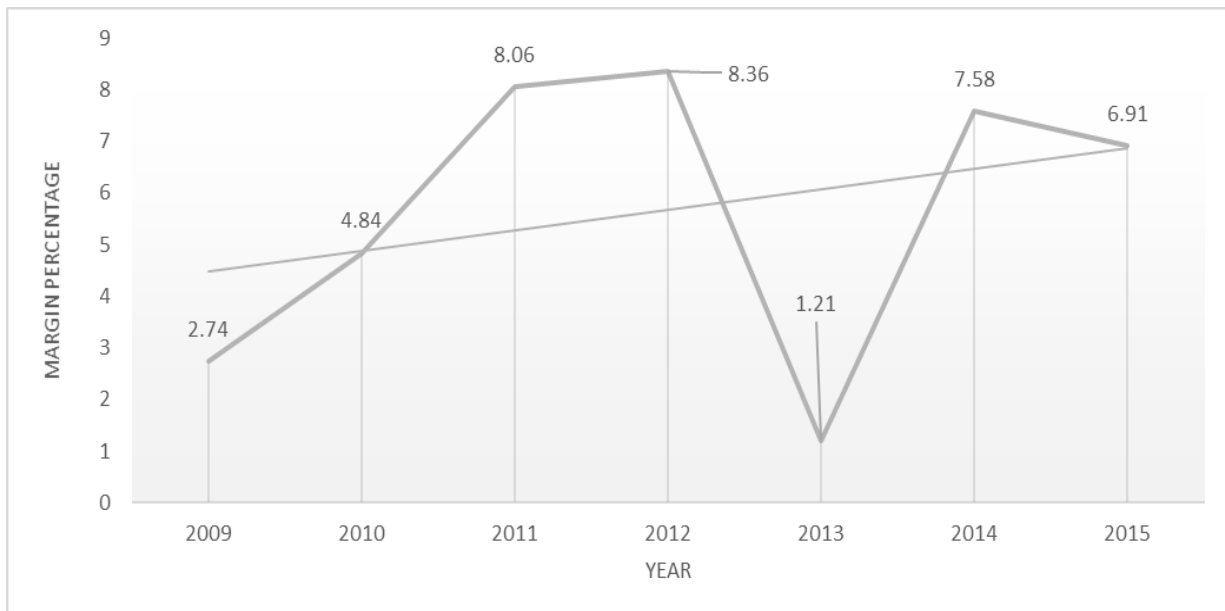


Figure 3

*Net Income Margin Percentage Means for Non-profit Hospitals, 2009-2015*

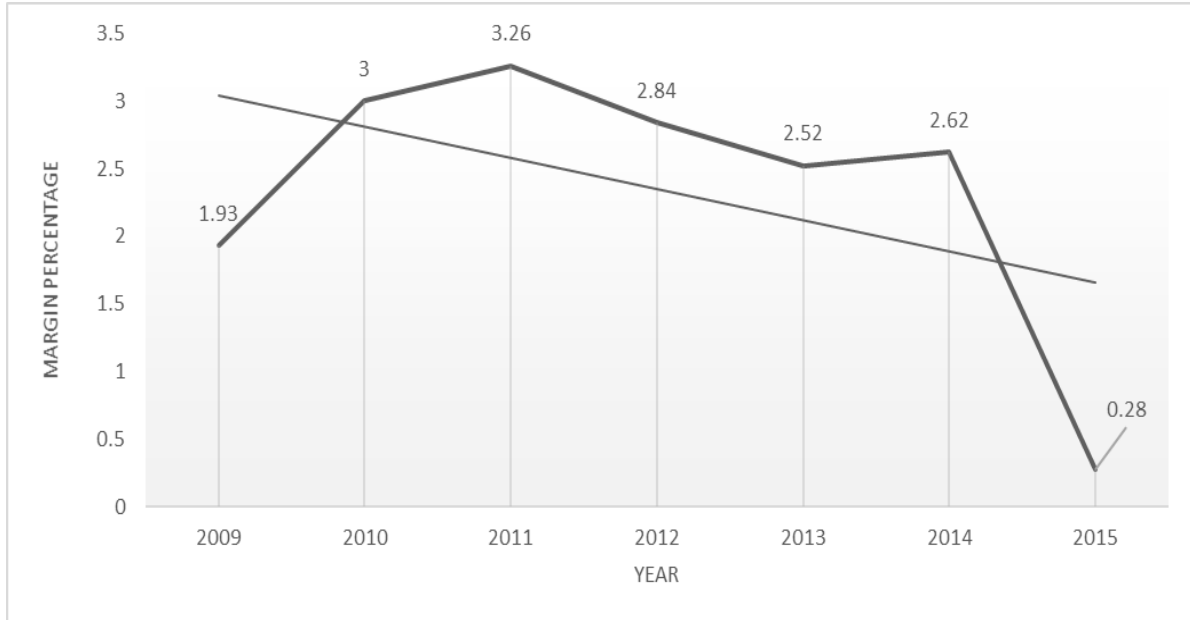
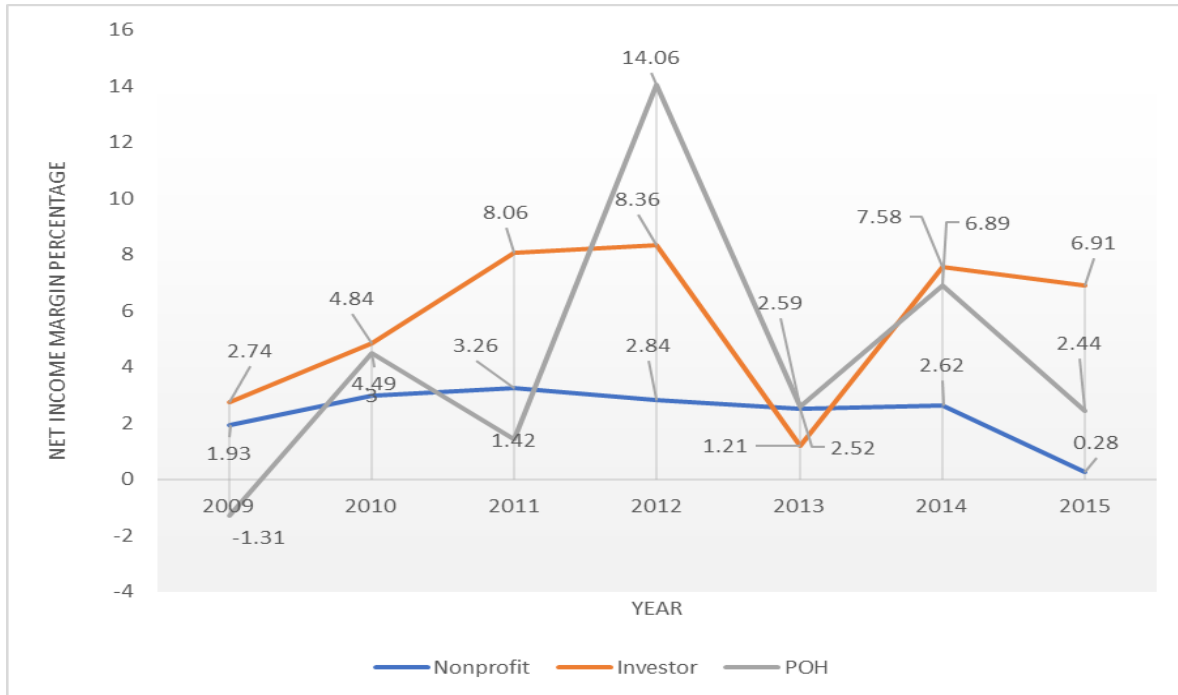


Figure 4

*Net Income Margin Percentage Means For All Hospitals, 2009-2015*



The second dependent variable, low-reimbursing payor mix percentage, shows a positive trend for all hospital types. By combining the three charts (Figure 8), it is possible to see that POH accept the fewest number of low-reimbursing patients (as a percentage of their payor mix) compared to other hospitals. Investor-owned and non-profit hospitals have a similar payor mix of low-reimbursing patients (Figure 8). Non-profit hospitals show the least amount of variability in their low-reimbursing payor mix (Figure 7).

Figure 5

*Low-Reimbursing Insurance Payor Mix Percentage Means for Physician-Owned Hospitals, 2009-2015*

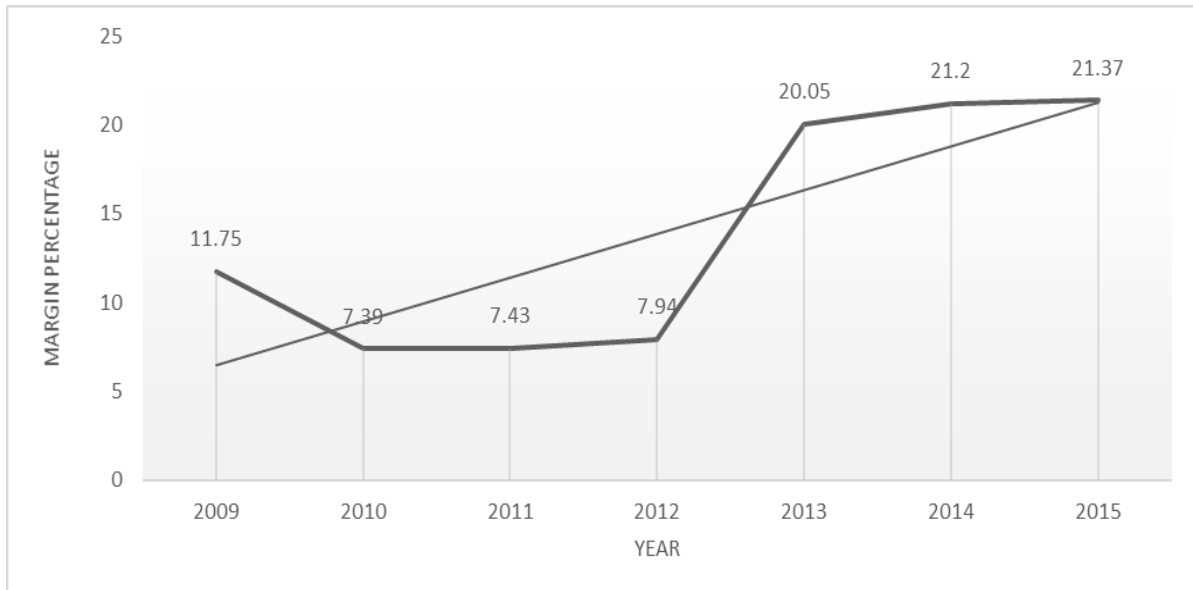


Figure 6

Low-Reimbursing Insurance Payor Mix Percentage Means for Investor-owned Hospitals, 2009-2015

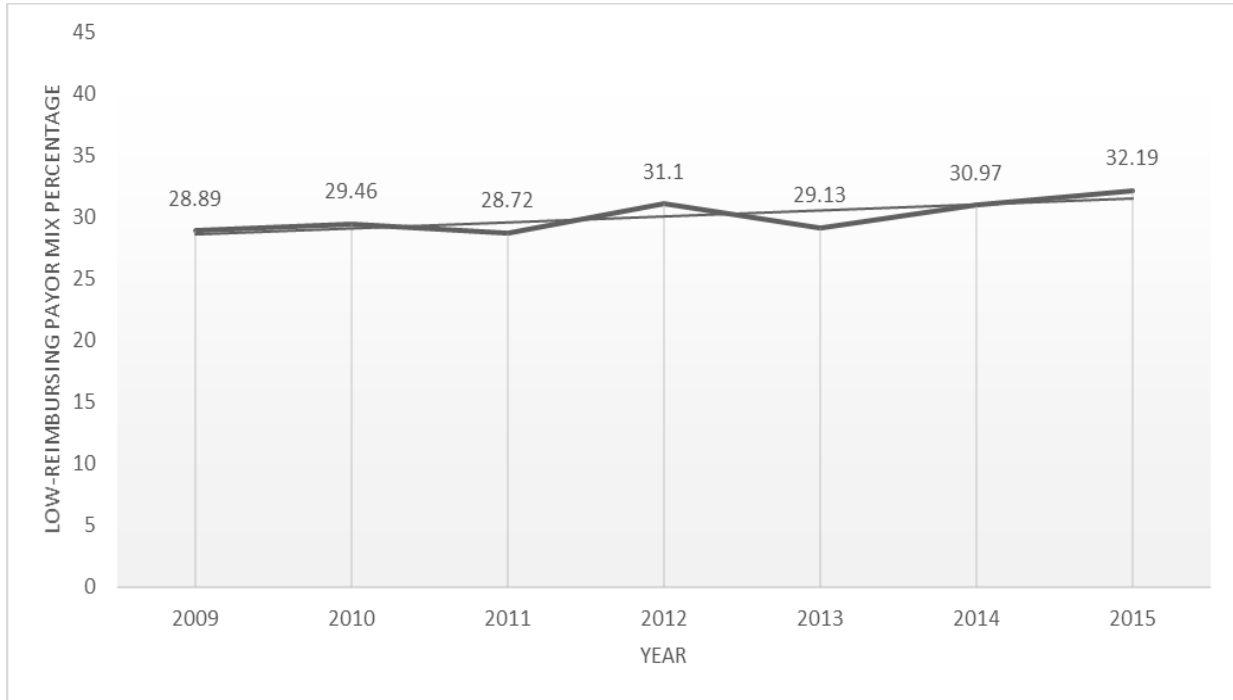


Figure 7

Low-Reimbursing Insurance Payor Mix Percentage Means for Non-profit Hospitals, 2009-2015

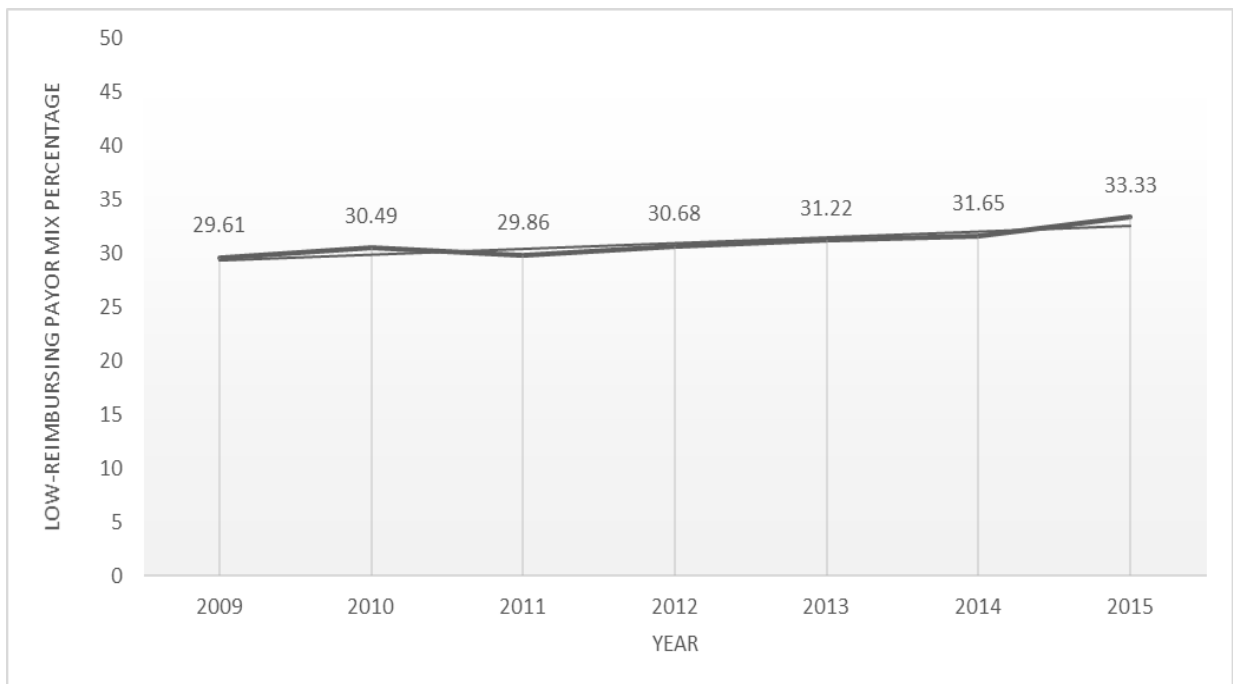
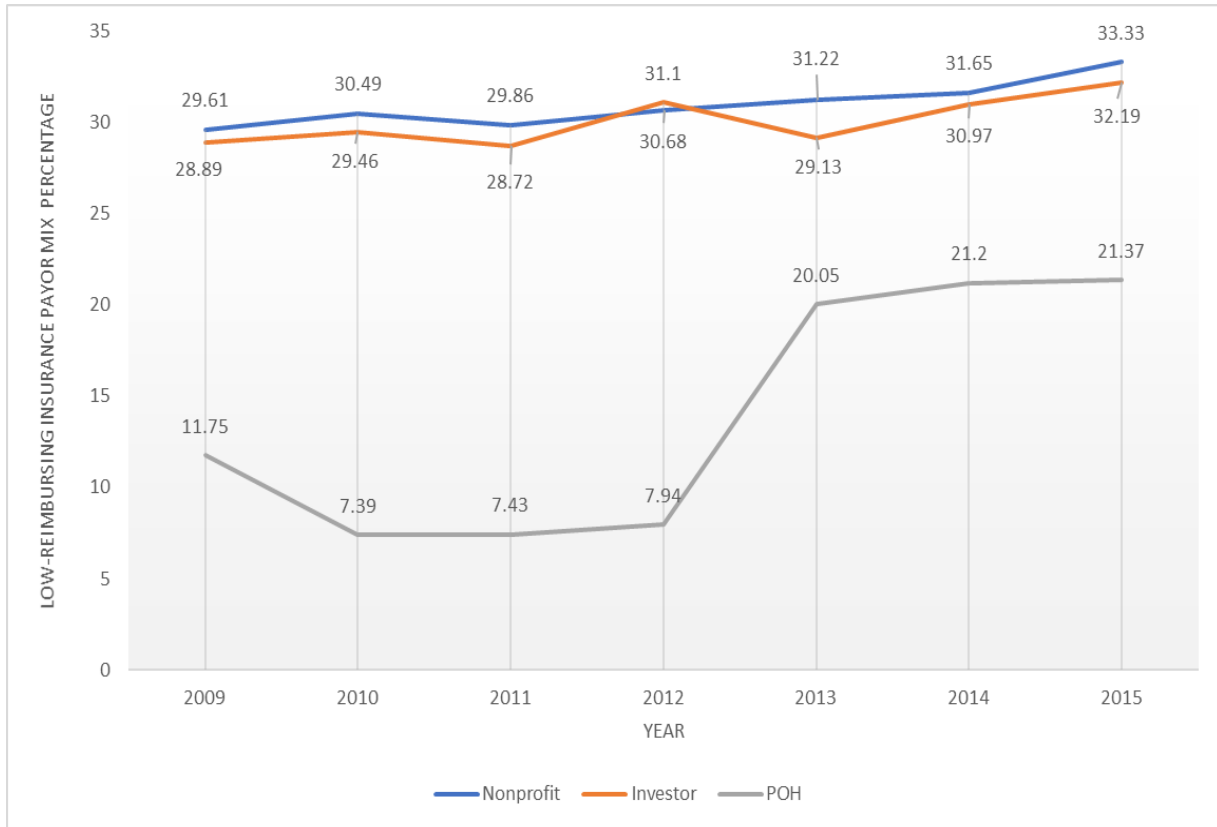




Figure 8

*Low-Reimbursing Insurance Payor Mix Percentage Means for All Hospitals, 2009-2015*



The results of the data presented in this section indicate a higher level of variability among POHs for the various variables. The data shows that POHs tend to have fewer beds, have volatile net income margins, accept very few patients with indigent insurance, and overall accept fewer patients with low-reimbursing insurance.

**Research objective #2.** Empirically assess the profitability of physician-owned hospitals compared to other hospitals in California for each year and over time. The first statistical analysis conducted to answer this research objective was a one-way between groups ANOVA. Comparing the three hospital ownership groups to each other resulted in statistically significant results in 2011, 2012, and 2014. Table 4 lists the p-values. Tukey and Scheefe post-hoc analyses

confirms the results are significant in these years between investor-owned and non-profit hospitals. There is no statistically significant between POHs and other hospital ownership types.

Table 5

*One-Way Between Groups ANOVA Net Income Margin*

Year	POH N	Inv N	NP N	Total	POH Mean(SD)	Inv Mean (SD)	NP Mean (SD)	F-value	P-Value	Multiple Comparison	Tukey P-Value	Scheffe P-Value
2009	5	110	260	375	-1.31 (25.1)	2.74 (13.4)	1.93 (17.3)	.20	.82			
2010	7	107	258	372	6.63 (7.0)	5.12 (19.8)	3.00 (15.5)	.72	.49			
2011	8	106	256	370	1.42 (19.3)	8.06 (13.4)	3.26 (16.5)	3.64	.03*	Inv, NP	.02*	.03*
2012	8	106	259	373	14.06 (22.82)	8.36 (13.0)	2.84 (14.6)	7.32	.001**	Inv, NP	.003**	.004**
2013	7	109	254	370	2.59 (10.8)	1.21 (40.6)	2.52 (14.76)	.10	.90			
2014	7	104	258	369	6.89 (7.2)	7.58 (11.6)	2.62 (13.0)	5.98	.003**	Inv, NP	.002**	.003**
2015	7	106	256	369	2.45 (8.9)	6.91 (19.7)	0.28 (46.7)	1.01	.36			

Inv = investor, NP = non-profit

\* p < .05, \*\* p < .01

From the correlation analysis, statistically significant results are noted from the 2009 data (correlation matrices were generated for each year in the sample) in Appendix D. The statistically significant variables relating to the dependent variable net income margin percentage were included as covariates in the random effects regression model. The variables that were included in the model from the correlation analyses are: teaching status ( $r = .13$ ), licensed beds ( $r = .11$ ), licensed bed occupancy rate ( $r = .22$ ), average length of stay ( $r = -.11$ ), and charity percentage of operating expenses ( $r = -.14$ ).

The random effects linear regression model, reported in Table 6 indicates that several independent variables are statistically significant and can predict the dependent variable net income margin: investor-owned hospitals ( $b = .35$ ,  $p < .001$ ), licensed beds occupancy rate ( $b = .46$ ,  $p < .001$ ), and average length of stay ( $b = -.20$ ,  $p < .001$ ). The variable of most interest, POH, is not associated with predicting the dependent variable. The results indicate that compared to non-profit hospitals (reference variable), investor-owned hospitals are associated with an increase in net income margin percentage by 35%. An increase in licensed beds occupancy rate

by 1% increases net income margin percentage by 46%. Increasing the average length of stay by 1% decreases the dependent variable by 20%. The model is statistically significant with a VIF of 1.60.

Table 6

*Random Effects Linear Regression Net Income Margin Percentage*

<b>Parameter</b>	<b>Standardized Coefficient</b>	<b>Standard Error</b>	<b>z</b>	<b>p-value</b>
<b>Constant</b>	-2.29	0.11	-20.65	< .001***
<b>POH</b>	0.11	0.08	0.44	.66
<b>Investor-owned Hospitals</b>	0.35	0.08	4.26	< .001***
<b>Teaching Status</b>	0.17	0.15	1.18	.24
<b>Licensed Beds Occupancy Rate</b>	0.46	0.08	5.81	< .001***
<b>Average Length of Stay</b>	-0.20	0.04	-4.92	< .001***

Dependent variable: net income margin percentage

Observations = 1,872, groups = 448, statistically significant (prob > chi2 = 0.00)

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

For the repeated measures ANOVA, the descriptive data (Table 7) shows the mean net income margin percentages for each hospital group. In 2009-2012, the POH mean is higher than the other hospital groups. For 2013 and 2015, it is lower. In 2014 the mean net income margin mean for POHs was between the other two hospital groups.

Table 7

*Net Income Margin Percentage Repeated Measures ANOVA Descriptives*

Variable	Ownership	N	Mean	SD
Net Income Margin 2009	POH	4	0.09	0.1
	Investor	66	0.05	0.1
	Nonprofit	170	0.03	0.2
	Total	240	0.03	0.2
Net Income Margin 2010	POH	4	0.11	0.0
	Investor	66	0.05	0.2
	Nonprofit	170	0.03	0.2
	Total	240	0.04	0.2
Net Income Margin 2011	POH	4	0.10	0.0
	Investor	66	0.07	0.1
	Nonprofit	170	0.04	0.1
	Total	240	0.05	0.1
Net Income Margin 2012	POH	4	0.23	0.3
	Investor	66	0.08	0.1
	Nonprofit	170	0.04	0.1
	Total	240	0.05	0.1
Net Income Margin 2013	POH	4	-0.04	0.1
	Investor	66	0.05	0.2
	Nonprofit	170	0.03	0.1
	Total	240	0.03	0.2
Net Income Margin 2014	POH	4	0.03	0.0
	Investor	66	0.08	0.1
	Nonprofit	170	0.02	0.1
	Total	240	0.04	0.1
Net Income Margin 2015	POH	4	-0.03	0.1
	Investor	66	0.08	0.1
	Nonprofit	170	0.03	0.2
	Total	240	0.05	0.2

The analysis of between-subjects effects and pairwise comparisons shows significant results for the combination of investor-owned and non-profit hospitals. There is no association between POHs and other hospital groups in this analysis. Analyzing each year of data in the sample indicates no statistical significance between specific years. This analysis indicates that

the net income margin percentage means are significantly different between investor-owned and non-profit hospitals ( $p < .05$ ). However, specific points in time are not statistically significant,  $f(2, 237) = 14.39$ .

Table 8

*Net Income Margin Percentage Repeated Measures ANOVA Results*

Test of Between-Subject Effects			
	F	14.39 (2, 237)	
	P-value	0.01*	
Pairwise Comparisons Between Groups			
	Group	Mean	Standard Error
	POH	7.01	4.3
	Investor	6.78	1.06
	Nonprofit	3.20	0.66
		P-value	
	POH vs Investor	1.00	
	POH vs Nonprofit	1.00	
	Investor vs Nonprofit	0.01*	
Comparisons of Time			
	Time	Mean	Standard Error
	2009	5.72	2.81
	2010	6.52	2.79
	2011	7.26	2.39
	2012	11.30	2.47
	2013	1.39	3
	2014	4.42	2.19
	2015	3.05	2.63
	All Interactions p-values	> .05	

\*  $p < .05$

**Summary:** This study attempts to determine if hospital ownership types are associated with higher or lower net income margins. The random effects regression model shows that

hospital ownership is not associated with net income margin percentage as far as POHs are concerned. This may be due to the dependent variable not being normally distributed. Investor-owned hospital ownership was associated with the dependent variable. There are not statistically significant differences in the mean net income margin percentage between the different hospital groups.

**Research objective #3.** Evaluate the payor mix of physician-owned hospitals compared to other hospitals in California for each year and over time. The first statistical analysis conducted to answer this research objective is a one-way between groups ANOVA. The results indicate there is statistically significant differences in low-reimbursing payor mix between POH and investor-owned hospitals ( $p < .05$ ), and POH and non-profit hospitals in 2010, 2011, and 2012 ( $p < .05$ ). This indicates that there are statistical differences between POHs and the other hospitals groups in three years of the sample data. The p-values are listed below in Table 9, and statistically significant results are noted.

Table 9

*One-way Between Groups ANOVA Low-Reimbursing Insurance Payor Mix*

Year	POH N	Inv N	NP N	Total	POH Mean(SD)	Inv Mean (SD)	NP Mean (SD)	F-value	P-Value	Multiple Comparison	Tukey P-Value	Scheffé P-Value
2009	8	154	368	530	11.75 (24.5)	28.89 (29.3)	29.61 (26.0)	1.72	.18			
2010	11	153	367	531	7.39 (9.4)	29.46 (29.0)	30.49 (26.3)	3.96	.02*	POH, Inv; POH, NP	.02*, .01*	.03*, .02*
2011	11	153	367	531	7.43 (10.1)	28.72 (29.9)	29.86 (27.1)	3.73	.03*	POH, Inv; POH, NP	.03*, .02*	.04*, .03*
2012	11	153	367	531	7.94 (8.9)	31.10 (29.8)	30.67 (27.2)	3.87	.02*	POH, Inv; POH, NP	.02*, .02*	.02*, .02*
2013	10	154	366	530	20.05 (18.0)	29.13 (27.6)	31.22 (26.6)	1.09	.34			
2014	10	154	367	531	21.20 (17.8)	30.97 (29.3)	31.65 (27.0)	0.74	.48			
2015	10	154	367	531	21.37 (17.3)	32.19 (29.6)	33.33 (26.4)	0.99	.37			

Inv = investor, NP = non-profit

\*  $p < .05$

From the correlation analyses, statistically significant results are noted from the 2009 data (correlation matrixes were generated for each year in the sample) in Appendix D. The statistically significant variables relating to the dependent variable low-reimbursing payor mix

were included as covariates in the random effects regression model. The variables that were included in the model from the correlation matrixes are: teaching status ( $r = .125$ ), licensed beds ( $r = .137$ ), average length of stay ( $r = .140$ ), and charity percentage of operating expenses ( $r = .138$ ).

The random effects linear regression model indicates that several independent variables are associated with a lower reimbursement payor mix (Table 10). The variable of most interest, POH ownership, is statistically significant meaning that it does predict low reimbursing payor mix. The statistically significant variables are POH ( $b = -0.13$ ,  $p = .02$ ), and teaching status ( $b = .14$ ,  $p < .001$ ). The coefficients show that if a hospital is categorized as a POH, low-reimbursing payor mix is would go down by 13%. If a hospital is categorized as teaching, low-reimbursing payor mix is increased by 14%. The model is statistically significant and has a VIF of 1.28.

Table 10

*Random Effects Linear Regression Low-Reimbursing Payor Mix Percentage*

<b>Parameter</b>	<b>Standardized Coefficient</b>	<b>Standard Error</b>	<b>z</b>	<b>p-value</b>
<b>Constant</b>	0.36	.01	24.68	< .001***
<b>POH</b>	-0.13	0.05	-2.44	0.02*
<b>Investor-owned Hospitals</b>	-0.03	0.02	-1.58	.11
<b>Teaching Status</b>	0.14	0.04	3.85	.001**
<b>Average Length of Stay</b>	0.00	0.01	-0.45	.65

Dependent variable: low-reimbursing payor mix percentage

Observations = 2,591, groups = 467, statistically significant (prob > chi2 = 0.00)

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

For the repeated measures ANOVA, the descriptive data (Table 11) shows the mean low-reimbursing payor mix for each hospital group in each year. The low-reimbursing payor mix for POHs is consistently below that of the other two hospital groups.

Table 11

*Low-Reimbursing Insurance Payor Mix Percentage Repeated Measures ANOVA Descriptives*

Variable	Ownership	N	Mean	SD
Low Reimbursing Percentage 2009	POH	11	0.15	0.2
	Investor	153	0.29	0.3
	Nonprofit	366	0.30	0.3
	Total	530	0.29	0.3
Low Reimbursing Percentage 2010	POH	11	0.07	0.1
	Investor	153	0.29	0.3
	Nonprofit	366	0.30	0.3
	Total	530	0.30	0.3
Low Reimbursing Percentage 2011	POH	11	0.07	0.1
	Investor	153	0.29	0.3
	Nonprofit	366	0.30	0.3
	Total	530	0.29	0.3
Low Reimbursing Percentage 2012	POH	11	0.08	0.1
	Investor	153	0.31	0.3
	Nonprofit	366	0.31	0.3
	Total	530	0.30	0.3
Low Reimbursing Percentage 2013	POH	11	0.20	0.2
	Investor	153	0.29	0.3
	Nonprofit	366	0.31	0.3
	Total	530	0.30	0.3
Low Reimbursing Percentage 2014	POH	11	0.21	0.2
	Investor	153	0.31	0.3
	Nonprofit	366	0.32	0.3
	Total	530	0.31	0.3
Low Reimbursing Percentage 2015	POH	11	0.19	0.2
	Investor	153	0.32	0.3
	Nonprofit	366	0.33	0.3
	Total	530	0.33	0.3

The between-subjects effects analysis indicates statistical significance (Table 13). This means there is statistical significance when comparing the means of low reimbursing pay mix percentage across the hospital ownership groups of POH vs investor-owned, and POH vs non-profit hospitals ( $f [2, 527] = 3.89$ )( $p = .02$ ). However, when considering specific years in this



analysis (2009-2015), the results are not statistically significant. The result shows that while there are significant differences in the means, specific points in time are not significant between the hospital ownership groups.

Table 12

*Low-Reimbursing Insurance Payor Mix Percentage Repeated Measures ANOVA Results*

Test of Between-Subject Effects			
	F	3.89 (2, 527)	
	P-value	.02*	

Pairwise Comparisons Between Groups			
	Group	Mean	Standard Error
	POH	14.20	5.94
	Investor	30.11	1.59
	Nonprofit	30.98	1.03

	P-value
POH vs Investor	.03*
POH vs Nonprofit	.02*
Investor vs Nonprofit	1.00

Comparisons of Time			
	Time	Mean	Standard Error
	2009	24.66	2.85
	2010	22.44	2.84
	2011	21.99	2.84
	2012	23.22	2.85
	2013	26.93	2.82
	2014	28.06	2.85
	2015	28.42	2.87
	All Interactions p-values	> .05	

\* p < .05

**Findings:** This study attempts to determine if hospital ownership type is associated with low-reimbursing insurance payor mix percentage. The regression model shows that the POHs category is associated with the dependent variable while investor hospitals are not. The repeated measures ANOVA confirms what was learned in the one-way between subjects ANOVA: POHs

are significantly different than other hospitals groups. The repeated measures ANOVA was not able to isolate significance between specific years in the sample.

## **Chapter 5: Conclusions, Policy, Limitations, and Future Research**

The purpose of this chapter is to consider the research objectives and how they relate to the allegations against POHs and what was found in this study. This chapter will also suggest what the findings mean for health policy. The limitations of this study will be discussed and ideas for future research presented.

### **Conclusion**

The first research objective, describing hospitals in California, shows that the ACA was successful in restricting POHs in California. No new ones have opened and existing ones have not expanded. This is consistent with the Plummer (2016) study which showed the same results in Texas. How this study differs from the Plummer (2016) study is in the number of new POHs that opened just prior to passage of the ACA. In California the number of POHs grew from eight to 11. In Texas the POHs expanded by 20. The policy section of this chapter discusses an approach for allowing POHs to expand in ways that will minimize potential financial harm to other hospitals.

The primary allegation against POHs that this study investigated was whether POHs in California have cherry-picked or cream-skimmed patients, resulting in an advantageous payor mix (third research objective). Furthermore, this study considered if the profitability of POHs was different than other hospitals (second research objective). The data shows that POHs in California from 2009-2015 have an advantageous payor mix that is statistically significant in several years (2010-2012). The analysis is clear that POHs have a payor mix that is favorable because they have fewer low-reimbursing insurance patients. This study did not attempt to determine if the patients were healthier, only the type of insurance they carried. This conclusion validates the allegation that POHs cherry-pick or cream-skim patients. This study did not attempt

to determine if this advantageous payor mix was obtained by POHs intentionally. It simply exists in the time period 2009-2015. These results are in contrast to the Blumenthal (2015) study which found that POHs did not accept a significantly lower number of patients with Medicaid.

Logically, an advantageous payor mix could result in higher profit margins (second research objective). The results show that POHs do not have a statistically higher net income margin compared to other hospitals. Having an advantageous payor mix would help achieve higher profit margins. POHs may have disadvantages compared to other hospitals that prevent them from achieving higher profit margins (location, size, services offered). These results create tension because POHs appear to be taking advantage of the system by having such an advantageous payor mix, while appearing benign because their profit margins are not higher than other hospitals. In the Plummer (2016) study, Texas POHs post-ACA did very well financially, much better than their non-POHs counterparts. In this study, POHs have not performed at a financially higher level compared to other hospital groups.

In conclusion, it is apparent that POHs occupy a very small portion of the hospital market in California (objective one). Their payor mix is desirable (objective three), but they do not seem to benefit financially from this advantageous payor mix (objective two). Policy makers should consider these factors when determining how to proceed with legislation affecting POHs.

### **Policy**

From the Conclusion section of this chapter, it is known that physician hospital ownership (POHs) is associated with a statistically significant more advantageous payor mix. POHs have a lower fraction of their payor mix from poorly paying sources. But this advantageous payor mix does not benefit them consistently. Their net income margin is not statistically different than other hospital ownership groups. If POHs did not exist in California,

their advantageous patient payor mix would be transferred to other hospitals. The number of POHs is so small, the other hospitals would not see any measurable improvements in their net income margins.

POHs as a business model exist because of a loophole in the Stark law (the whole hospital exception). The ability of physician hospital owners to take advantage of this opening in California has not been successful during 2009-2015. One of the strengths POHs enjoy because of their relatively small size is maneuverability in the marketplace. They can transition from performing cardiac procedures to orthopaedic procedures quickly. But with ACA limitations, they cannot expand. Thus POHs in California are benign under the current conditions.

The coefficients from the random effects regression model for net income margin percentage indicate that compared to non-profit hospitals, investor-owned hospitals are financially stronger. They further indicate that as the amount of charity care increases, the profit margin decreases. The ACA's requirement that non-profit hospitals provide community benefit (or charity care) should be re-examined. It is incongruent that non-profit hospitals must provide charity care while investor-owned hospitals do not, considering how much it impacts net income margin percentage.

The coefficients from the random effects regression model for low reimbursing payor mix indicate that as the percentage of charity care increases, so does the low reimbursing payor mix. The result is similar to the previous paragraph where non-profit hospitals are disadvantaged by having to provide charity care. As they continue to provide additional charity care (as required by the ACA), their payor mix continues to deteriorate. Policymakers should consider requiring all hospitals to provide a community benefit or charity care, and the amount should be

specific. As the ACA is written, the value or level of community benefit is not specified. To level the playing field, all hospitals should be treated equally in this regard.

The question for policymakers is what to do about the restrictions placed on POHs. If the ACA falls in 2021 at the US Supreme Court, should policymakers continue these restrictions? If the ACA survives in 2021, should the restrictions on POHs be reconsidered?

Policymakers should make changes such that the conflicts of interest inherent with POHs (self-referral) are minimized. Physician owners should be permitted to own a small specialty hospital, but at a reduced level of having less than a 25% stake. There is still an incentive for profitability, but individual physician self-referral effects would be watered down. With physician ownership capped at less than 25%, POHs should be permitted to expand and new ventures opened. It is likely that POH partners would materialize from the for-profit and non-profit sectors to fill out the ownership stakes in POHs. By encouraging POHs to partner with other hospitals (investor-owned and non-profit), the challenges POHs face in providing emergency and intensive care can be alleviated. If physicians want to open large comprehensive hospitals, there should be no restrictions placed on this option. Large comprehensive hospitals serve a vital community interest and face the same challenges as their investor-owned and non-profit counterparts.

### **Study Limitations**

A study is always limited by the data it uses for the analysis. Data from OSHPD is not without fault. While hospitals are required to submit their data each year, not every hospital complies to the same degree. For instance, Kaiser hospitals provided insurance payor mix data, but not the financial variables data. These gaps in the data could have affected the results because non-profit hospitals were underrepresented in this area. Depending on how well Kaiser

hospitals performed financially, the mean net income margin for non-profit hospitals could have gone up or down, affecting how POHs compared to them.

It is possible some POHs were missed when creating the groups to be studied. With the number of POHs being relatively low, missing one or two hospitals could have impacted the results.

Because POHs tend to be specialty hospitals that focus on a limited number of disease states or procedures, it might have been beneficial to control for the severity of patient diagnosis or case mix. This would help account for the differences in insurance payor mix or net profit margin percentage between a comprehensive acute care hospital and a small specialty hospital that only focuses on cardiac or orthopedic procedures. Unfortunately this data was not a part of the data set downloaded from OSHPD.

The statistical analysis shows what has happened to POHs pre-/post-ACA, but the results cannot be directly attributed to the ACA. From the results, we cannot conclude that POHs have performed better or worse, compared to the other hospital ownership types. If the ACA were to fall, it cannot be known conclusively if POHs would dominate in the healthcare marketplace or if they would remain in relative obscurity.

### **Further Research**

As a study that is focused on providing useful results for policymakers, this study should be repeated for the years 2016-2020 (when the data becomes available). The more recent the results, the more useful it would be to those making policy decisions. Much has changed in the healthcare arena since 2015, notably the COVID-19 pandemic. As each new year of data is published by OSHPD, the results could be updated and made public to interested parties.

There were statistically significant results in the repeated measures ANOVA for net income margin percentage between investor-owned and non-profit hospitals. Comparing these two groups in greater detail might yield results that are relevant to those that raise concerns about whether non-profit hospitals should retain their non-profit status, or if investor-owned hospitals are too concerned with profit and not enough with providing community benefit.

Results indicated that POHs had a smaller low reimbursing payor mix (significant in 2010, 2011, and 2012) compared to other hospitals. It is not known why this occurs. Are POHs rejecting Medi-Cal patients? Do physicians not refer Medi-Cal patients to their POH facilities? Or do they accept all patients and simply have fewer Medi-Cal patients seeking medical treatment at their facilities? Are the locations of POHs in areas with few Medi-Cal patients?

The American Hospital Association annual survey contains an item asking if a hospital is physician-owned. If this question were a requirement of the American Hospital Association annual survey, or included in the OSHPD survey, it would aid further research as a more definitive list of POHs could be established. It makes sense that if the law creates special requirements for POHs, a list of POHs should be available to interested parties.

Adding a qualitative aspect to future studies could provide meaningful understanding to what is happening to POHs in California. By interviewing POHs CEOs, context for the results of the dependent variables could point researchers in new directions that help explain the results of how POHs differ from investor-owned or non-profit hospitals.

In the literature review, other studies controlled for hospital size (licensed beds) and teaching status in their linear regression models (Blumenthal, 2015 and Plummer, 2016). This study indicates other variables should be considered as covariates: licensed beds occupancy rate, and average length of stay. Controlling for these additional variables (if the data is available)



can help narrow down the effect the main independent variable (hospital ownership) is having on a given dependent variable.

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## Appendix A

Table A1

*All Variables Available in the Dataset*

Variable	Type	Available or Computed
Hospital Ownership Type	Categorical	Available
Teaching Status	Categorical	Available
Low-Reimbursing Insurance Payor Mix	Continuous	Computed
High Reimbursing Insurance Payor Mix	Continuous	Computed
Licensed Beds	Continuous	Available
Licensed Beds Occupancy Rate	Continuous	Available
Available Beds	Continuous	Available
Available Beds Occupancy Rate	Continuous	Available
Patient Days	Continuous	Available
Discharges	Continuous	Available
Average Length of Stay	Continuous	Available
Gross Patient Revenue	Continuous	Available
Deductions from Revenue	Continuous	Available
Capitation Premium	Continuous	Available
Net Patient Revenue	Continuous	Available
Other Operating Revenue	Continuous	Available
Total Operating Revenue	Continuous	Available
Operating Expenses	Continuous	Available
Net from Operations	Continuous	Available
Non-Operating Revenue	Continuous	Available
Non-Operating Expense	Continuous	Available
Income Taxes	Continuous	Available
Extraordinary Items	Continuous	Available
Net Income	Continuous	Available
Current Ratio	Continuous	Available
Days in Accounts Receivable	Continuous	Available
Long-Term Debt to Net PPE	Continuous	Available
Long-Term Debt to Equity	Continuous	Available
Equity to Total Assets	Continuous	Available
Net Return on Total Assets	Continuous	Available
Patient Revenue Margin	Continuous	Available
Operating Margin	Continuous	Available
Total Margin	Continuous	Available
Net Income Margin	Continuous	Available
Cost-to-Charge Ratio	Continuous	Available
Net PPE Per Licensed Bed	Continuous	Available
Charity-Other	Continuous	Available
Charity-Other + Bed Debt	Continuous	Available
Charity-Other + Bed Debt + CIP	Continuous	Available
Charity % of Operating Exp	Continuous	Available
Charity + Bad Debt + CIP Adj % of Op Exp	Continuous	Available
ER Visits	Continuous	Available
Clinic Visits	Continuous	Available
Home Health Visits	Continuous	Available
Referred O/P Visits	Continuous	Available
I/P Surgeries	Continuous	Available
O/P Surgeries	Continuous	Available
Purchased I/P Days	Continuous	Available

## Appendix B

Table B1

### *Hospital Characteristics by Ownership Type, 2009*

	Physician-owned	Investor-owned	Non-profit	Government
Number of Hospitals Reporting	7	128	250	90
Patient payor mix %	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Medicare	39.47 (18.2)	38.85 (28.1)	33.24 (20.6)	30.37 (26.0)
Med-Cal	11.58 (25.7)	24.82 (24.5)	19.71 (17.2)	27.59 (22.6)
Private	35.46 (23.7)	21.02 (20.6)	34.05 (20.3)	14.53 (15.3)
County Indigent	0.18 (0.3)	2.84 (10.3)	0.93 (2.8)	4.98 (13.8)
Other Government	0.19 (0.2)	3.38 (14.8)	3.31 (13.0)	4.49 (14.5)
Other indigent	0 (0)	0.26 (0.7)	0.24 (0.8)	0.39 (1.5)
Self-Pay	1.27 (1.5)	2.17 (2.7)	3.32 (5.9)	4.51 (5.4)
Other Payer	0.13 (0.2)	1.07 (3.3)	0.43 (2.4)	0.58 (2.9)
<b>Hospital Characteristics</b>				
Number of Hospitals Reporting	5	110	186	74
Licensed Beds	98.2 (55.1)	179.71 (143.9)	224.14 (193.4)	206.65 (150.3)
Licensed Beds Occupancy Rate %	60.54 (16.2)	59.44 (18.2)	57.81 (16.5)	60.17 (18.6)
<b>Financial Characteristics</b>				
Number of Hospitals Reporting	5	110	186	74
Net Income Margin %	-1.31 (25.1)	2.74 (13.4)	1.93 (17.5)	2.78 (11.6)
Charity % of Operating Expenses	1.89 (0.9)	1.36 (1.8)	1.69 (1.6)	1.61 (2.0)

Table B2

*Hospital Characteristics by Ownership Type, 2010*

	Physician-owned	Investor-owned	Non-profit	Government
Number of Hospitals Reporting	10	127	250	88
Patient payor mix %	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Medicare	44.58 (17.8)	37.46 (26.2)	32.67 (18.1)	26.38 (22.0)
Med-Cal	4.40 (7.5)	24.91 (23.2)	19.81 (17.0)	28.98 (22.4)
Private	37.35 (23.2)	21.23 (20.6)	32.60 (20.0)	13.1 (13.3)
County Indigent	0.57 (0.7)	3.07 (11.0)	0.85 (1.7)	6.51 (15.8)
Other Government	0.59 (0.7)	2.68 (11.8)	3.48 (13.0)	4.03 (13.2)
Other indigent	0.06 (0.2)	0.40 (1.1)	0.28 (0.9)	0.36 (1.3)
Self-Pay	2.25 (1.8)	3.05 (5.3)	3.35 (5.7)	4.93 (6.2)
Other Payer	0.09 (0.2)	1.03 (3.5)	0.45 (2.2)	1.39 (10.4)
Hospital Characteristics				
Number of Hospitals Reporting	9	107	193	63
Licensed Beds	70.44 (132.3)	116.86 (98.7)	222.15 (197.7)	195.88 (211.6)
Licensed Beds Occupancy Rate %	39.92 (23.4)	58.67 (19.7)	58.67 (15.5)	58.87 (17.7)
Financial Characteristics				
Number of Hospitals Reporting	9	107	193	63
Net Income Margin %	4.49 (7.7)	4.84 (19.7)	3.00 (15.5)	1.21 (7.1)
Charity % of Operating Expenses	0.22 (0.3)	1.31% (1.7)	1.87 (2.0)	2.06 (3.1)



Table B3

*Hospital Characteristics by Ownership Type, 2011*

	Physician-owned	Investor-owned	Non-profit	Government
Number of Hospitals Reporting	9	114	236	71
Patient payor mix %	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Medicare	48.09 (16.4)	40.06 (25.5)	34.93 (17.1)	31.40 (21.1)
Med-Cal	5.13 (8.5)	27.60 (23.0)	21.20 (17.4)	32.28 (19.1)
Private	38.12 (20.4)	20.86 (18.9)	34.04 (18.3)	15.06 (13.1)
County Indigent	0.20 (0.4)	3.83 (12.4)	1.00 (1.9)	8.06 (16.9)
Other Government	0.87 (1.1)	1.93 (9.1)	3.60 (13.0)	4.39 (12.3)
Other indigent	0.16 (0.4)	0.43 (1.2)	0.27 (0.8)	0.28 (0.9)
Self-Pay	2.34 (2.0)	3.27 (5.2)	3.61 (5.7)	6.22 (6.6)
Other Payer	0.19 (0.6)	1.27 (3.7)	0.59 (2.8)	1.91 (11.9)
Hospital Characteristics				
Number of Hospitals Reporting	10	106	192	62
Licensed Beds	64.40 (95.5)	155.41 (97.7)	258.62 (200.3)	188.15 (180.2)
Licensed Beds Occupancy Rate %	36.47 (23.5)	61.02 (20.4)	56.29 (16.4)	58.35 (18.1)
Financial Characteristics				
Number of Hospitals Reporting	10	106	192	62
Net Income Margin %	1.42 (19.3)	8.06 (13.4)	3.26 (16.5)	4.22 (7.2)
Charity % of Operating Expenses	0.18 (0.3)	1.45 (1.7)	1.96 (1.7)	2.08 (3.4)

Table B4

*Hospital Characteristics by Ownership Type, 2012*

	Physician-owned	Investor-owned	Non-profit	Government
Number of Hospitals Reporting	10	121	238	73
Patient payor mix %	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Medicare	45.26 (20.2)	39.53 (25.3)	35.28 (17.3)	33.02 (20.2)
Med-Cal	4.67 (7.9)	28.51 (24.0)	21.48 (17.4)	31.19 (17.5)
Private	35.80 (20.9)	20.49 (18.9)	32.91 (18.2)	14.89 (12.7)
County Indigent	0.05 (0.1)	3.34 (11.5)	1.13 (2.5)	6.96 (13.2)
Other Government	0.71 (1.0)	1.97 (7.2)	3.32 (12.0)	4.88 (12.7)
Other indigent	0.11 (0.3)	0.44 (1.1)	0.37 (1.1)	0.26 (0.6)
Self-Pay	2.16 (1.7)	3.46 (5.6)	3.52 (5.6)	6.38 (5.9)
Other Payer	0.23 (0.5)	1.38 (4.0)	1.43 (7.4)	2.03 (11.9)
Hospital Characteristics				
Number of Hospitals Reporting	10	106	196	61
Licensed Beds	64.40 (95.5)	158.16 (99.4)	256.81 (198.8)	192.20 (183.5)
Licensed Beds Occupancy Rate %	35.62 (23.0)	59.38 (19.6)	55.35 (16.7)	56.31 (18.1)
Financial Characteristics				
Number of Hospitals Reporting	10	106	196	61
Net Income Margin %	14.06 (22.8)	8.36 (13.0)	2.84 (14.6)	0.80 (6.9)
Charity % of Operating Expenses	0.15 (0.3)	1.26 (1.5)	2.09 (1.8)	2.11 (3.5)

Table B5

*Hospital Characteristics by Ownership Type, 2013*

	Physician-owned	Investor-owned	Non-profit	Government
Number of Hospitals Reporting	9	124	234	77
Patient payor mix %	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Medicare	47.41 (16.7)	40.47 (25.1)	35.64 (18.4)	34.37 (20.5)
Med-Cal	15.66 (15.1)	24.13 (20.3)	23.80 (18.5)	27.99 (21.6)
Private	29.60 (16.1)	22.16 (18.9)	29.06 (18.5)	22.28 (17.8)
County Indigent	1.90 (2.9)	4.03 (11.0)	2.34 (8.7)	3.61 (7.1)
Other Government	0.58 (0.5)	3.61 (12.3)	2.82 (10.5)	4.08 (13.1)
Other indigent	0.26 (0.7)	0.55 (2.3)	0.32 (0.9)	0.55 (2.1)
Self-Pay	3.01 (1.7)	0.63 (1.9)	3.98 (6.3)	4.85 (5.2)
Other Payer	0.73 (1.8)	0.64 (1.9)	1.29 (8.1)	1.29 (4.1)
Hospital Characteristics				
Number of Hospitals Reporting	9	111	188	64
Licensed Beds	225.56 (234.3)	177.14 (141.2)	227.90 (189.5)	231.92 (191.4)
Licensed Beds Occupancy Rate %	62.16 (18.0)	57.56 (19.7)	53.34 (17.5)	55.33 (19.8)
Financial Characteristics				
Number of Hospitals Reporting	9	111	188	64
Net Income Margin %	2.59 (10.8)	1.21 (40.6)	2.52 (14.8)	3.16 (17.0)
Charity % of Operating Expenses	1.08 (1.3)	1.29 (1.6)	2.07 (2.0)	1.79 (2.1)

Table B6

*Hospital Characteristics by Ownership Type, 2014*

	Physician-owned	Investor-owned	Non-profit	Government
Number of Hospitals Reporting	9	122	235	75
Patient payor mix %	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Medicare	46.81 (15.9)	38.42 (24.7)	35.07 (17.7)	33.73 (19.3)
Med-Cal	20.16 (17.1)	30.16 (23.6)	27.71 (19.7)	35.16 (25.6)
Private	28.97 (16.2)	21.28 (18.4)	28.88 (18.2)	22.23 (17.2)
County Indigent	0.10 (0.1)	1.57 (6.5)	0.43 (3.1)	0.69 (2.4)
Other Government	0.69 (0.5)	3.62 (13.3)	2.67 (10.1)	2.68 (6.8)
Other indigent	0.02 (0.0)	0.46 (3.0)	0.08 (0.4)	0.08 (0.3)
Self-Pay	1.85 (1.0)	2.61 (3.9)	3.02 (6.0)	3.62 (4.7)
Other Payer	0.59 (1.6)	0.80 (2.2)	1.34 (8.1)	1.31 (4.8)
Hospital Characteristics				
Number of Hospitals Reporting	9	105	194	62
Licensed Beds	217.22 (229.5)	184.89 (143.9)	223.75 (180.1)	226.63 (185.8)
Licensed Beds Occupancy Rate %	61.64 (16.7)	58.51 (18.8)	53.28 (17.8)	56.02 (20.4)
Financial Characteristics				
Number of Hospitals Reporting	9	105	194	62
Net Income Margin %	6.89 (7.2)	7.58 (11.6)	2.62 (13.0)	5.76 (9.2)
Charity % of Operating Expenses	0.75 (1.0)	0.99 (1.3)	1.68 (1.8)	1.19 (1.3)

Table B7

*Hospital Characteristics by Ownership Type, 2015*

	Physician-owned	Investor-owned	Non-profit	Government
Number of Hospitals Reporting	9	122	241	76
Patient payor mix %	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Medicare	47.27 (15.5)	38.78 (24.8)	35.35 (18.3)	32.70 (20.1)
Med-Cal	20.31 (16.5)	32.56 (24.8)	29.27 (20.9)	37.49 (26.5)
Private	28.29 (15.2)	19.96 (17.4)	27.81 (18.2)	20.89 (17.1)
County Indigent	0.02 (0.0)	1.15 (3.6)	0.50 (4.5)	1.13 (5.3)
Other Government	0.75 (0.5)	3.64 (13.3)	3.06 (12.0)	0.60 (2.1)
Other indigent	0.02 (0.0)	0.31 (2.7)	0.09 (0.4)	2.40 (7.3)
Self-Pay	1.86 (1.0)	2.07 (3.8)	2.16 (3.6)	0.16 (0.7)
Other Payer	0.61 (1.7)	0.73 (2.4)	1.02 (5.3)	3.51 (6.7)
Hospital Characteristics				
Number of Hospitals Reporting	9	107	190	64
Licensed Beds	212.56 (221.8)	183.77 (140.9)	220.52 (176.0)	228.59 (190.4)
Licensed Beds Occupancy Rate %	61.85 (13.0)	85.11 (254.3)	54.69 (17.5)	53.49 (21.2)
Financial Characteristics				
Number of Hospitals Reporting	9	107	190	64
Net Income Margin %	2.44 (8.9)	6.91 (19.7)	0.28 (46.7)	(8.10) (89.0)
Charity % of Operating Expenses	0.47 (0.5)	0.67 (1.0)	1.13 (1.3)	2.31 (9.5)

## Appendix C

Table C1

### *Kruskal-Wallis H Test Net Income Margin, 2009-2015*

Year	POH N	Inv N	NP N	Total	POH Median	Inv Median	NP Median	Statistic	P-Value	Multiple Comparison	P-Value
2009	5	110	260	375	4.79	3.15	2.89	0.24	.89		
2010	9	107	256	372	6.95	6.39	3.44	5.68	.06		
2011	10	106	254	370	4.48	7.74	4.25	9.81	.01*	Inv, NP	.002**
2012	10	106	257	373	3.84	7.89	3.93	14.09	.001**	Inv, NP	< .001***
2013	9	109	252	370	1.69	6.58	4.15	8.04	.02*	Inv, NP	.005**
2014	9	104	256	369	4.76	8	3.28	14.36	.001*	Inv, NP	< .001***
2015	9	107	254	370	5.42	7.51	4.58	9.64	.008**	Inv, NP	.002**

Inv = investor, NP = non-profit

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

### *Kruskal-Wallis H Test Low-Reimbursing Insurance Payor Mix, 2009-2015*

Year	POH N	Inv N	NP N	Total	POH Median	Inv Median	NP Median	Statistic	P-Value	Multiple Comparison	P-Value
2009	8	154	368	530	3.15	23.15	24.7	5.48	.07		
2010	11	153	367	531	3.82	25.19	26.86	8.81	.01*	POH, Inv; POH, NP	.01*, .002**
2011	11	153	367	531	2.63	22.43	26.3	8.72	.01*	POH, NP	.003**
2012	11	153	367	531	6.67	26.69	27.23	7.8	.02*	POH, Inv; POH, NP	.03*, .003**
2013	10	154	366	531	15.06	25.86	27.78	2.37	.31		
2014	10	154	367	531	16.73	24.84	28.27	1.66	.44		
2015	10	154	367	531	17.11	26.95	30.97	2.34	.31		

Inv = investor, NP = non-profit

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

## Appendix D

Table D1

*Correlation Matrix, 2009*

Variable	Teaching Status	Low Reimbursing Payer Mix	Licensed Beds	Licensed Beds Occupancy Rate	Average Length of Stay	Net Income Margin	Charity % of Operating Expenses
Teaching Status	1	.125**	.147**	0.074	-0.042	0.031	0.052
Low Reimbursing Payer Mix	.125**	1	0.008	0.073	0.002	-0.067	.138**
Licensed Beds	.147**	0.008	1	0.093	-0.151**	0.039	.232**
Licensed Beds Occupancy Rate	0.074	0.073	0.093	1	.208**	0.133**	-0.036
Average Length of Stay	-0.042	0.002	-0.151**	.208**	1	-0.73	-.171**
Net Income Margin	0.031	-0.067	0.039	0.133**	-0.073	1	0.065
Charity % of Operating Expenses	0.052	.138**	.232**	-0.036	-.171**	0.065	1

\*\* . Correlation is significant at the 0.01 level,

\* . Correlation is significant at the 0.05 level