Is Hospital Employment of Physicians a Sustainable Alignment Strategy?  
An Analysis and Recommendations for Avoiding Potential Costly Consequences

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Table of Contents

Introduction........................................................................................................... 3
Background and Significance............................................................................... 4
Literature Review................................................................................................. 7
Hypotheses............................................................................................................ 10
Methods and Materials....................................................................................... 11
Results and Discussion....................................................................................... 15
Potential Limitations........................................................................................... 20
Conclusion and Recommendations..................................................................... 22
References.......................................................................................................... 29

List of Figures and Tables

Figure 1. Number of Employed Physicians, 1999-2010
Figure 2. Percentage of U.S. Independent Physician Practices and Employed by Hospitals, 2002-2008
Table 1. Sample Composition
Table 2. Variable Definitions
Table 3. Population to Sample Comparison
Table 4. Descriptive Statistics
Table 5. Impact of Physician Employment on Hospital Financial Performance
Table 6. Change Model: Impact of Physician Employment on Hospital Financial Performance
Introduction

Health spending is the single largest fiscal challenge to the U.S. economy, according to the National Commission on Fiscal Responsibility and Reform (2010). The U.S. spends twice as much as any other industrialized nation on healthcare and this trend is increasing at an alarming rate. Healthcare outlays are projected to cost more than four trillion dollars and account for 20 percent of the total gross domestic product by 2018, more than double 2007 spending (Sisko et al., 2009). Supplier-induced demand from poorly aligned physician and hospital reimbursement and financial incentives are commonly cited factors attributed to rising healthcare costs (Wennberg, Barnes, & Zubkoff, 1982; Mark, Evans, Schur, & Guterman, 1998; Goldsmith, J., 2006; Thompson & Bishop, 2007; Trybou, Gemmel, & Annemans, 2011).

Aligning the disparate financial incentives of physicians and hospitals provides a significant challenge for both. Physician fee-for-service reimbursement lends to wide practice variation and overuse contributing to rapidly rising costs prompting hospital leaders to seek financial alignment with referring physicians. Among the various approaches to improving physician-hospital alignment, such as including them in the organization’s governance and management structures; employing physicians is becoming an increasingly popular model. According to Madison (2004), physicians who are financially integrated are more likely to be concerned about the financial impact of their practice patterns. However, quantifying the financial impact of employing physicians is important for hospital leaders to better seek the right integration strategy with referring physicians to achieve their financial goals. The purpose of this work is to build upon existing research by analyzing the impact of physician employment on hospital financial performance.
An analysis of more than 2,000 non-governmental, non-primary teaching general acute care facilities between 2005 and 2009 showed that increasing the number of employed referring physicians increased net patient revenue, both from the hospital and from its employed physicians. Employed physicians improve hospital net patient revenues by providing more billable services and also by enlarging the hospital’s capacity, utilization, and patient base. The analysis also revealed that increasing the number of employed physicians added to hospital expenses, as would be expected, from acquisition and start-up costs, capital expenses, and increased operating expenses. The net result of the increase in expense outweighed the increase in patient revenue, even over multiple years, thus contributing to overall losses. Nearly 40 percent of the hospitals studied increased their ranks of employed physicians over the five-year period. Among them, more than 60 percent experienced an average $6.7 million annual net income reduction, or $377,000 loss per additional employed physician – cautionary evidence for hospital leaders seeking financial alignment with their physicians by employing them.

**Background and Significance**

Historically, the potential upside of the hospital-employed physician model was not fully recognized under managed care as many anticipated. In fact, many hospital-owned physician practices in the late 1980s and early 1990s failed due to lack of physician involvement in practice operations and development, unaligned financial incentives to see more patients and control costs, lack of practice management expertise, and a focus on primary care practices at the expense of including other, more lucrative, specialties to balance the losses (Peters, 1999). Acquiring mostly primary care practices, high acquisition prices, insufficient practice cash flows, lack of productivity, and at-risk compensation incentives were other factors attributed to the
failure of hospitals’ employing physicians during this period. This caused most hospitals to divest or downsize their employed physician networks (Burns & Pauly, 2002).

Like the late 1980s and early 1990s, employing physicians is the prevailing model, especially in the past several years. Between 2000 and 2010, the number of employed physicians increased by 32 percent (AHA, 2012). As shown in Figure 1, the five-year study period from 2005 through 2009 had a marked increase in the number of employed physicians compared to previous years. The total increase in the number of employed active physicians, both part- and full-time, in the previous five-year period between 2000 and 2004 was 4,576, only 0.9 percent. The total increase in the number of employed physicians during the study period between 2005 through 2009 was 5,628, or more than 21 percent, reflecting an average increase of 5.6 percent per year. The increase in the number of employed physicians in 2010 was only 2.9 percent.

Moreover, the employment trend is expected to accelerate with a projected 24 percent increase of physician employment from 2010 to 2020 (Bureau of Labor Statistics, 2012). Industry experts also predict increasing physician employment, especially by hospitals. Two-thirds are predicted to be employed by 2013 (Accenture, 2011), 70 percent of hospitals and health systems plan to hire more physicians within one to three years (Betbeze, 2011), and three-quarters of all newly-hired physicians will be hospital employees (Merritt Hawkins, 2012).
However, unlike the previous wave of physician employment that was largely in response to the anticipated penetration of managed care, the current catalyst is the implementation of health reform whereby hospitals have a significant incentive to own as many pieces of the care continuum as possible. Hospitals may also be seeking to take advantage of opportunities to grow market share by acquiring physician practices and, ostensibly, direct business from their employed physicians. Accordingly, the rate of physician-owned practices is declining while the percentage of hospital-owned practices is growing, as presented in Figure 2.

Like the previous physician employment movement, early research shows that hospitals are again losing on their employed physician practices – $150,000 to $250,000 per physician per year during the first three years of employment (Kocher & Sahni, 2011). The losses are attributed to the significant investment, lengthy ramp-up period, and potential for decreased physician productivity. Losses that many hospitals may view as a necessary long-term investment to shore up their referring physician base; the ulterior motive for acquiring physician practices beyond the goals of improving coordination, quality, and access, according to Burns and Pauly (2002).
Literature Review

Physician-hospital integration, including the employment model, is a popular study area among many researchers. The existing quantitative studies on the impact of physician-hospital relationships on hospital financial performance present widely-varying results depending on the specific models evaluated, study design and setting, and the time period and timeframe of the study. Improved physician-hospital integration is purported by some researchers to create an economy of scale from which the efficiencies gained enable lower costs and in turn translate to lower prices for payers. This would then create a competitive market advantage compared to other non-integrated provider entities.

Among the reasons why hospitals pursue integration with their physicians, Burns and Muller (2008) cite achieving financial goals that include increasing outpatient market share, revenues, and margins. Various studies address the likely increased attraction of vertically integrated systems, both to patients and payers, based on improved access to the continuum of care and the potential for improved coordination that can be offered from a single integrated electronic medical record. Moreover, the ‘one-stop shop’ approach offers managed care organizations the ease and reduced administrative cost of contracting with one entity that represents both hospitals and physicians.

Cuellar and Gertler (2006) examined the effects of hospital-physician integration on hospital efficiency, prices, and volume using panel data from Arizona, Florida, and Wisconsin between 1994 and 1998. They assessed independent practice associations (IPAs), open physician-hospital organizations (OPHOs), closed physician-hospital organizations (CPHOs), and management service organization (MSOs), and fully integrated organizations (FIOs), which included both of the physician employment models (integrated salary and foundation models).
They observed that integration had no impact on hospital efficiency. They further observed that the integrated salary and foundation models had no impact on prices or volume.

Ciliberto and Dranove (2006) used data from California hospitals between 1994 and 2001 to examine the effects of OPHOs, CPHOs, and the integrated salary model on hospital prices. They found no impact of these models, positive or negative, on changes in hospital prices. Also using data from California hospitals more than a decade earlier between 1981 and 1990, Goes and Zhan (1995) assessed hospital financial performance based on several physician-hospital strategies. The authors observed that financial integration, including physician employment, was positively related to hospital profitability and occupancy and negatively related to hospital costs.

Madison (2004) explored the effects of several physician-hospital alignment strategies on hospital care and related costs and clinical outcomes between 1994 and 1998. Among the models examined were the integrated salary model, foundation model, IPA, PHO, and group practice without walls (GPWW). She reported that the integrated salary model was associated with slightly higher procedure rates and cost of care. Otherwise, the models assessed had limited impact on patient outcomes using only the single diagnosis of heart attack for Medicare patients.

Wang, Wan, Clement, and Begun (2001) assessed vertical integration relationships with hospital efficiency and performance among 363 California general acute care hospitals in 1994. They found that hospitals integrated with physician groups that also provided outpatient services had relatively better operating margins, return on assets, and net cash flows. Burns, Gimm, and Nicholson (2005) studied the impact of employing or otherwise affiliating with physicians on hospital financial performance in 36 large integrated delivery systems between 1995 and 1999. In the study sample, 67 percent of the hospitals employed physicians and 78 percent acquired physician practices. Systems that acquired physicians and salaried them experienced a six
percent average decrease in operating margin, compared to a 4.6 percent drop for those only using a physician salary model, and a five percent decrease in margin for systems with physician alliances; namely an MSO or PHO. The study analyzed only a small sample of integrated delivery systems and no independent hospital systems.

While the salaried model is generally hypothesized to have a positive association with hospital financial performance; there is no consensus. Some researchers contend that the hospital-employed physician model could compel cooperation with a hospital to achieve financial and quality goals through managerial authority and impose greater control over how services are provided and marketed compared to independent physicians (Goes & Zhan, 1995; Casalino & Robinson, 2003; Berenson, Bodenheimer, & Pham, 2006).

Other researchers (Sloan & Becker, 1981; Alexander & Morrissey, 1988; Casalino & Robinson, 2003; Ray & Kirz, 2000) paint a less optimistic picture about the impact of employing physicians, especially weighing historical performance. Hospitals adopting the physician employment strategy throughout the 1990s incurred significant financial losses, typically between $50,000 and $150,000 per employed physician per year (MGMA, 1998). Sloan and Becker (1981) found that hospitals with salary arrangements for non-hospital-based physicians had higher costs. Alexander and Morrissey (1988) also examined the implications of employing admitting physicians on hospital costs. Their findings suggest that integrating physicians into the hospital management structure may actually increase hospital costs.

Physician output under the employed model has been scrutinized and often criticized by researchers. Casalino and Robinson (2003) argued that the employment model suffers from the bureaucratic cost of diminished individual incentives. Ray and Kirz (2000) observed that employed physicians tend to be less productive and less cost-conscious compared to self-
employed physicians. Hutchinson and Foley (1999) found that salaried physicians generally had fewer patients than those paid fee-for-service. Moreover, some research suggests that salaried physicians are less aggressive in their treatment of patients compared to fee-for-service physicians (Luft, 1978; Danzon, Manning, & Marquis, 1984; Hickson, Altemeier, & Perrin, 1987).

Despite the wealth of published studies examining physician-hospital integration, including hospital employment, there are no published studies addressing the impact of physician employment on the two distinct variable measures of hospital financial performance – revenue and expense. Both of which are separately and collectively influenced by a physician’s practice patterns. Moreover, previous studies do not assess physician employment using a large national sample over an extended time period. Most published works address only the presence of the physician employment strategy without including the magnitude of impact on hospital financial performance.

**Hypotheses**

This study attempts to address these limitations by testing the following hypotheses tested, controlling for other factors:

1. The number of employed referring physicians will be significantly and positively related to net patient revenue;
2. The number of employed referring physicians will be significantly and positively related to operating expense; and
3. The number of employed referring physicians will be significantly and positively related to net income from service to patients.
Methods and Materials

Data Sources and Collection

The study uses two sources of hospital-level secondary data. The American Hospital Association Annual (AHA) Survey and Centers for Medicare and Medicaid Services (CMS) Cost Report. The AHA Annual Survey is comprised of self-reported individual hospital data that includes ownership status (e.g., investor-owned, not-for-profit, and government), service category (e.g., general medical surgical, psychiatric, heart, rehabilitation, and acute long-term care), number of licensed beds, and financial performance data. The annual survey also contains the number of physicians that participated in each of the common organizational structural arrangements, including the integrated salary and foundation models.

All Medicare certified hospitals are required to file a voluminous annual cost report with the U.S. Department of Health and Human Services (DHHS), Centers for Medicare and Medicaid Services (CMS). This report includes both detailed balance sheet and income statement information that must be consistent with the hospitals’ audited external financial reports. The cost reports are filed annually with the CMS intermediary within five months after the fiscal year end and are subject to Medicare compliance audits. The cost reports are used by CMS and by lawmakers to control and adjust program costs and payment rates. Individual hospitals are cross-matched between the data sets using the unique National Provider Identifier (NPI) contained in both secondary data sources.

Among the total population of hospitals in continuous operation between 2005 and 2009, only those years with submitted AHA Annual Surveys and completed CMS Cost Reports are used in the study. Because of their different financial data reporting requirements and financial goals, governmental hospitals are eliminated from the study. Critical access hospitals (CAH),
defined as having 25 or fewer licensed beds, are also eliminated since they receive increased reimbursement compared to general medical-surgical acute care hospitals. For the same reason, primary teaching hospitals, according to their membership in the Council of Teaching Hospitals and Health Systems (COTH), are also eliminated from the sample. Lastly, hospitals missing relevant data are also deleted from the analysis.

Sample

The sample contains 9,578 hospital year observations representing 2,018 unique hospitals. Sample information is detailed in Table 1. The five-year sample period captures the trend of increased employment relative to previous years, and is therefore ideal for assessing the impact of physician employment on hospital financial performance.

**Table 1**

<table>
<thead>
<tr>
<th>Hospital Years</th>
<th>2009</th>
<th>2008</th>
<th>2007</th>
<th>2006</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMS Hospitals</td>
<td>2,981</td>
<td>14,246</td>
<td>2,798</td>
<td>2,863</td>
<td>2,860</td>
</tr>
<tr>
<td>AHA Annual Survey Hospitals</td>
<td>6,702</td>
<td>31,748</td>
<td>6,334</td>
<td>6,407</td>
<td>6,312</td>
</tr>
<tr>
<td>Matched</td>
<td>2,809</td>
<td>13,691</td>
<td>2,752</td>
<td>2,761</td>
<td>2,746</td>
</tr>
<tr>
<td>No Matches</td>
<td>172</td>
<td>555</td>
<td>46</td>
<td>102</td>
<td>114</td>
</tr>
<tr>
<td>% Matched</td>
<td>94%</td>
<td>96%</td>
<td>98%</td>
<td>96%</td>
<td>96%</td>
</tr>
<tr>
<td>Missing and Out of Range</td>
<td>791</td>
<td>4,113</td>
<td>816</td>
<td>827</td>
<td>833</td>
</tr>
<tr>
<td>Final Sample</td>
<td>2,018</td>
<td>9,578</td>
<td>1,936</td>
<td>1,934</td>
<td>1,913</td>
</tr>
</tbody>
</table>

Study Design

The study design is a non-experimental, retrospective, and longitudinal multiple regression analysis. Regression analysis is used to compare the association and the strength of that association between the number of employed referring physicians and hospital financial performance, as well as to measure the magnitude of change on the dependent variables. The dependent variables measuring hospital financial performance are net patient revenue, total
operating expense, and net income from service to patients with respect to the changes in the independent variable – the number of referring physicians employed by a hospital or health system.

**Analytical Models**

**Net Patient Revenue**

\[ \text{Net Patient Revenue}_{it} = \beta_0 + \beta_1 \text{LN}_\text{EMPL}_{it} + \beta_2 \text{LOC}_i + \beta_3 \text{DEBT}_{it} + \beta_4 \text{CASEASSETS} + \beta_5 \text{SIZE}_i + \beta_6 \text{MCAID}_{it} + \beta_7 \text{MCARE}_{it} + \beta_8 \text{LAG}_\text{LOSS}_i + \beta_9 \text{RELI}_i + \beta_{10} \text{SYS}_i + \beta_{11} \text{SUBS}_i + \beta_{12} \text{NP}_i + \beta_{13} \text{YEAR06} + \beta_{14} \text{YEAR07} + \beta_{15} \text{YEAR08} + \beta_{16} \text{YEAR09} + \text{Firm Effects} + \varepsilon_{it} \] (1)

**Operating Expense**

\[ \text{Operating Expense}_{it} = \beta_0 + \beta_1 \text{LN}_\text{EMPL}_{it} + \beta_2 \text{LOC}_i + \beta_3 \text{DEBT}_{it} + \beta_4 \text{CASEASSETS} + \beta_5 \text{SIZE}_i + \beta_6 \text{MCAID}_{it} + \beta_7 \text{MCARE}_{it} + \beta_8 \text{LAG}_\text{LOSS}_i + \beta_9 \text{RELI}_i + \beta_{10} \text{SYS}_i + \beta_{11} \text{SUBS}_i + \beta_{12} \text{NP}_i + \beta_{13} \text{YEAR06} + \beta_{14} \text{YEAR07} + \beta_{15} \text{YEAR08} + \beta_{16} \text{YEAR09} + \text{Firm Effects} + \varepsilon_{it} \] (2)

**Net Income**

\[ \text{Net Income}_{it} = \beta_0 + \beta_1 \text{LN}_\text{EMPL}_{it} + \beta_2 \text{LOC}_i + \beta_3 \text{DEBT}_{it} + \beta_4 \text{CASEASSETS} + \beta_5 \text{SIZE}_i + \beta_6 \text{MCAID}_{it} + \beta_7 \text{MCARE}_{it} + \beta_8 \text{LAG}_\text{LOSS}_i + \beta_9 \text{RELI}_i + \beta_{10} \text{SYS}_i + \beta_{11} \text{SUBS}_i + \beta_{12} \text{NP}_i + \beta_{13} \text{YEAR06} + \beta_{14} \text{YEAR07} + \beta_{15} \text{YEAR08} + \beta_{16} \text{YEAR09} + \text{Firm Effects} + \varepsilon_{it} \] (3)

Serial correlation is evident in the models using the Durbin-Watson test. SAS’s SURVEYREG procedure and clustering by hospital identification number was used to avoid dependent residuals across multiple years (serial correlation) within the panel data.

**Definition and Measurement of Variables**

The study addresses three types of variables, defined in Table 2. They include the number of hospital-employed physicians (independent or explanatory variable), hospital financial outcomes (response or dependent variables), and control variables. The descriptive statistics are listed in Table 4. The robust general acute care hospital sample size ranges from 611 in 2005 to 634 in 2007. In each of the study years beginning in 2006, the number of employed physicians increases – both in the number of hospitals employing physicians and the number of employed physicians.
Ordinary least squares (OLS) regression analyses is used. Considering the correlation analysis along with the variance inflation factors, serial correlations do not impact the analysis.
Other plausible rival explanations for changes in hospital financial performance are considered in an attempt to control for potential endogeneity. Such factors include any hospital-specific outliers or other external market or internal organizational forces at-large. To control for outliers, variables are Winzorized at the one percent level. To ensure the statistical inferences do not suffer from serial dependence in the panel dataset and increase the probability of finding significant associations, standard errors are clustered at the firm level in the robustness analysis, thus controlling for the effects of temporal non-independence and resulting in the determination that the study inferences hold.

**Results and Discussion**

Table 3 presents a comparison between the sample (n) and the population (N) of general acute care hospitals. The sample and population appear reasonably close on most characteristic measures. The sample has lower annual average revenue and expenses, 10 percent and 12 percent, respectively, compared to the population. The sample has slightly fewer beds (4.6 percent), discharges (7.9 percent), and Medicaid patient population (9.8 percent) compared to the population. The sample also contains a higher proportion of hospitals that are not-for-profit (23.3 percent) and are part of a system (10.3 percent) compared to the population. Nonetheless, the sample appears representative of the population of general acute care hospitals and seems better suited for statistical analysis.
Table 3
Population to Sample Comparison (Acute Care General Hospitals)

<table>
<thead>
<tr>
<th></th>
<th>Mean Sample (9,578)</th>
<th>Std Sample (9,578)</th>
<th>Mean N Sample (13,691)</th>
<th>Std N Sample (13,691)</th>
</tr>
</thead>
<tbody>
<tr>
<td>REV</td>
<td>148,565,446</td>
<td>132,694,224</td>
<td>164,698,167</td>
<td>213,133,308</td>
</tr>
<tr>
<td>TEXP</td>
<td>146,569,261</td>
<td>130,370,572</td>
<td>166,103,041</td>
<td>217,425,631</td>
</tr>
<tr>
<td>NI</td>
<td>2,083,675</td>
<td>16,554,355</td>
<td>(1,413,162)</td>
<td>49,705,287</td>
</tr>
<tr>
<td>BEDS</td>
<td>214</td>
<td>161</td>
<td>225</td>
<td>249</td>
</tr>
<tr>
<td>DISC</td>
<td>9,184</td>
<td>7,533</td>
<td>9,642</td>
<td>10,031</td>
</tr>
<tr>
<td>CASEASSET</td>
<td>12,779</td>
<td>9,562</td>
<td>18,359</td>
<td>133,087</td>
</tr>
<tr>
<td>SIZE</td>
<td>13,787</td>
<td>12,904</td>
<td>14,966</td>
<td>17,825</td>
</tr>
<tr>
<td>MCAID</td>
<td>0.14</td>
<td>0.10</td>
<td>0.16</td>
<td>0.11</td>
</tr>
<tr>
<td>MCARE</td>
<td>0.40</td>
<td>0.12</td>
<td>0.41</td>
<td>0.13</td>
</tr>
<tr>
<td>LOC</td>
<td>0.71</td>
<td>0.45</td>
<td>0.70</td>
<td>0.46</td>
</tr>
<tr>
<td>SYS</td>
<td>0.78</td>
<td>0.42</td>
<td>0.71</td>
<td>0.46</td>
</tr>
<tr>
<td>SUBS</td>
<td>0.21</td>
<td>0.41</td>
<td>0.19</td>
<td>0.40</td>
</tr>
<tr>
<td>NP</td>
<td>0.75</td>
<td>0.43</td>
<td>0.61</td>
<td>0.49</td>
</tr>
</tbody>
</table>

Table 4 presents the descriptive statistics. Among the sample of 2,018 discrete hospitals in the survey; 51 percent have positive net income, 75 percent are not-for-profit, 19 percent are religiously affiliated, 78 percent are affiliated with a hospital system, 71 percent are located in an urban area, and 21 percent have subsidiaries.

Table 4
Descriptive Statistics (n = 9,578)

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Median</th>
<th>Std</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>REV</td>
<td>148,570,000</td>
<td>106,660,000</td>
<td>132,694,224</td>
<td>9,233,574</td>
<td>788,908,500</td>
</tr>
<tr>
<td>TEXP</td>
<td>146,570,000</td>
<td>104,620,000</td>
<td>130,370,572</td>
<td>10,689,005</td>
<td>766,812,200</td>
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<tr>
<td>NI</td>
<td>2,083,675</td>
<td>134,286</td>
<td>16,554,355</td>
<td>(57,731,296)</td>
<td>80,841,864</td>
</tr>
<tr>
<td>EMPL</td>
<td>15.18</td>
<td>2.00</td>
<td>38.91</td>
<td>1.00</td>
<td>281.00</td>
</tr>
<tr>
<td>DEBT</td>
<td>0.49</td>
<td>0.47</td>
<td>0.84</td>
<td>(23.09)</td>
<td>13.93</td>
</tr>
<tr>
<td>CASEASSET</td>
<td>12,779.00</td>
<td>10,630.00</td>
<td>9,562.00</td>
<td>106.45</td>
<td>158,084.00</td>
</tr>
<tr>
<td>SIZE</td>
<td>13,787.00</td>
<td>9,584.00</td>
<td>12,904.00</td>
<td>431.96</td>
<td>78,924.00</td>
</tr>
<tr>
<td>MCAID</td>
<td>0.14</td>
<td>0.12</td>
<td>0.10</td>
<td>0.00</td>
<td>0.87</td>
</tr>
<tr>
<td>MCARE</td>
<td>0.40</td>
<td>0.41</td>
<td>0.12</td>
<td>0.04</td>
<td>1.73</td>
</tr>
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<table>
<thead>
<tr>
<th></th>
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<th>Median</th>
<th>Std</th>
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<th>1</th>
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<tbody>
<tr>
<td>LAG_LOSS</td>
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<td>0.50</td>
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<td>4,842</td>
<td></td>
</tr>
<tr>
<td>LOC</td>
<td>0.71</td>
<td>0.45</td>
<td>2,492</td>
<td>7,086</td>
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</tr>
<tr>
<td>RELI</td>
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<td>0.39</td>
<td>7,749</td>
<td>1,829</td>
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</tr>
<tr>
<td>SYS</td>
<td>0.78</td>
<td>0.42</td>
<td>1,912</td>
<td>7,666</td>
<td></td>
</tr>
<tr>
<td>SUBS</td>
<td>0.21</td>
<td>0.41</td>
<td>7,531</td>
<td>2,047</td>
<td></td>
</tr>
<tr>
<td>NP</td>
<td>0.75</td>
<td>0.43</td>
<td>2,249</td>
<td>7,329</td>
<td></td>
</tr>
</tbody>
</table>
For the purpose of presenting the study results, the level of statistical significance identified in Tables 5 and 6 are categorized as marginally statistically significant ($p \leq 0.10$) and statistically significant ($p \leq 0.05$) and ($p \leq 0.01$), denoted as * and ** and ***, respectively.

Table 6 shows the results for model (1). The $R^2$ of 75 percent indicates that the model explains a high level of variation in total revenue. All variance inflation factors (VIF) are below two. However, a Durbin-Watson analysis reveals serial correlation warranting the use of a fixed-effects model. The variable of interest, LN_EMPL, shows a positive and significant ($p \leq 0.01$) association with LN_REV, indicating that a higher level of physician employment is positively associated with revenue as expected.

The control variables show signs as predicted. DEBT and MCAID are significantly ($p \leq 0.01$) and negatively associated with LN_REV, indicating that revenues are lower when hospitals have a high debt-to-asset ratio or have a loss in the previous year. CASEASSET, SIZE, LOC, SYS, SUBS, and NP are significantly ($p \leq 0.01$) and positively associated with LN_REV, indicating that revenues are higher when hospitals have high performance (CASEASSET), are larger, are located in urban areas, are part of a system, have subsidiaries, or are not-for-profit.

Table 5 also presents the results for model (2), whereby the $R^2$ of 76 percent indicates explanation of a high level of variation in total expense. The variable of interest, LN_EMPL, shows a positive and significant ($p \leq 0.01$) association with LN_TEXP, indicating that a higher level of physician employment is related to an increase in total expense as predicted.
The signs of MCAID and MCARE confirm the study predictions; however, the p-values indicate that these variables are marginally significant and not significant \(p = 0.04\) and \(p = 0.41\), respectively). CASEASSET, SIZE, LOC, SUBS, and NP are significantly \(p \leq 0.01\) and positively associated with \(\text{LN}_T\text{EXP}\); whereas SYS shows positive significance \(p \leq 0.05\) in its association with \(\text{LN}_T\text{EXP}\); indicating that revenues are higher when hospitals have high performance (CASEASSET), are larger, are in urban areas, are part of a hospital system, have subsidiaries, or are not-for-profit.

Lastly, Table 5 shows the results for model (3). The \(R^2\) indicates that the model explains 31 percent of the variation in net income. Similar to models (1) and (2), model (3) is run using a fixed effects model. The variable of interest, LN_EMP, shows a negative and marginally significant \(p = 0.09\) association with NI. DEBT, LAG_LOSS, RELI, and NP are significantly

\[1 = \beta_0 + \beta_1 \text{LN}_T\text{EMPL} + \beta_2 \text{LOC} + \beta_3 \text{DEBT} + \beta_4 \text{CASEASSET} + \beta_5 \text{SIZE} + \beta_6 \text{MCAID} + \beta_7 \text{MCARE} + \beta_8 \text{LAG_LOSS} + \beta_9 \text{RELI} + \beta_{10} \text{SYS} + \beta_{11} \text{SUBS} + \beta_{12} \text{NP} + \beta_{13} \text{YEAR06} + \beta_{14} \text{YEAR07} + \beta_{15} \text{YEAR08} + \beta_{16} \text{YEAR09} + \text{Firm Effects} + \epsilon_i\]

\(1^*, **, ***\) represent significance at 10 percent, 5 percent, and 1 percent, respectively, based on two-tailed tests.

\(2^*\) Change variables are calculated by taking the current year's raw values less the previous year's raw values.

\(3^*\) See Table 2 for variable definitions.
(\(p \leq 0.01\)) and negatively associated with NI; indicating that NI is lower when hospitals have a high debt-to-asset ratio, have a loss in the previous year, are religiously affiliated, or are not-for-profit. SIZE is significantly (\(p \leq 0.01\)) and positively associated with NI, indicating that net income is higher when hospitals are larger. CASEASSET and MCARE are not statistically significant (\(p = 0.49\) and \(p = 0.89\), respectively).

The results support the hypotheses that the number of employed referring physicians is significantly and positively related to net patient revenue and to operating expense, controlling for other factors. However, the results do not support the hypothesis that the number of employed referring physicians is significantly and positively related to net income from service to patients.

In addition to the level models [model (1), model (2), and model (3)], an analysis is performed using change models to highlight the impact of changes in the level of employed physicians on the changes in revenue, expense, and net income. All change variables are calculated by subtracting the lag value (previous year’s value) from the current year’s value (2004 data is used to calculate change variables).

\[
\text{LN}_\Delta \text{REV}_{it} = \beta_0 + \beta_1 \text{LN}_\Delta \text{EMPL}_{it} + \beta_2 \Delta \text{DEBT}_{it} + \beta_3 \Delta \text{CASEASSETS}_{it} + \beta_4 \Delta \text{SIZE}_{it} + \beta_5 \Delta \text{MCAID}_{it} + \beta_6 \Delta \text{MCARE}_{it} + \beta_7 \Delta \text{LOSS}_{it} + \beta_8 \Delta \text{SUBS}_{it} + \text{Firm Effects} + \epsilon_{it} \quad (4)
\]

\[
\text{LN}_\Delta \text{TEXP}_{it} = \beta_0 + \beta_1 \text{LN}_\Delta \text{EMPL}_{it} + \beta_2 \Delta \text{DEBT}_{it} + \beta_3 \Delta \text{CASEASSETS}_{it} + \beta_4 \Delta \text{SIZE}_{it} + \beta_5 \Delta \text{MCAID}_{it} + \beta_6 \Delta \text{MCARE}_{it} + \beta_7 \Delta \text{LOSS}_{it} + \beta_8 \Delta \text{SUBS}_{it} + \text{Firm Effects} + \epsilon_{it} \quad (5)
\]

\[
\Delta \text{NI}_{it} = \beta_0 + \beta_1 \text{LN}_\Delta \text{EMPL}_{it} + \beta_2 \Delta \text{DEBT}_{it} + \beta_3 \Delta \text{CASEASSETS}_{it} + \beta_4 \Delta \text{SIZE}_{it} + \beta_5 \Delta \text{MCAID}_{it} + \beta_6 \Delta \text{MCARE}_{it} + \beta_7 \Delta \text{LOSS}_{it} + \beta_8 \Delta \text{SUBS}_{it} + \text{Firm Effects} + \epsilon_{it} \quad (6)
\]
Table 6 shows the results of the change model analysis. LN_ΔEMPL is significantly \((p=0.01)\) and positively associated with LN_ΔREV and LN_ΔTEXP. The result for model (6) shows that the association of ΔNI to LN_ΔEMPL is positive; however, not statistically significant. The results for these set of models support the first two hypotheses; however, the results do not support the third hypothesis. An increase in the number of employed physicians is positively associated with an increase in revenue and operating expense; however, there is only no statistically significant impact on the change in net income.

**Potential Limitations**

There are several limitations inherent to the study. First is the ability to control for the influence of other variables on hospitals’ financial performance during the study period. Influencing unobservable external market factors could include national and regional policy changes, such as hospital reimbursement. Internal factors include management talent, competitive strategy, technology, hospital reputation and quality, physician involvement in
hospital governance structure, negotiated managed care contract rates, and Medicare market
basket increases that could increase revenue, even though volumes were flat or even declining.

Second, since using the larger national hospital population precludes identifying the total
number of physicians on the hospital’s medical staff, measuring the magnitude of each model on
hospital financial performance will need to be addressed using both hospital volume and
financial measures as a proxy. Third, limitations of the secondary data prevent the ability to
determine when the physician became employed by the hospital. For the purpose of the study it
is assumed that physicians participating in the employment model were employed during the
entire reporting year. Fourth, there is no way to determine the full-time equivalency of the
employed physician from the data set. Assumingly, full-time employed and active practicing
physicians will have a greater impact on hospital financial performance compared to part-time
physicians. The average ratio during the study period is 77 percent full-time and 23 percent part-
time employed (AHA, 2012).

A fifth limitation inherent to the hospital-level data is the inability to identify the scope of
the employment arrangement between the hospital and the physician; particularly the
compensation methods that can vary widely by hospital. Most current employment agreements
will likely tie some level of physician employment compensation to productivity or other “pay-
for-performance” measures. Numerous researchers (Jones, 1974; Sims, Cabral, Daley, & Alfano,
1984; Hemenway, 1994, 1995; Kouides et al., 1998; Chaix-Couturier, Durand-Zaleski, Jolly, &
Durieux, 2000) have associated pay-for-performance with improved clinical outcomes and
reduced expense. Nonetheless, the structure and proportion of base salary versus performance-
based compensation, as well as the effect it has on physicians’ practice pattern, is unknown from
the available data and a worthy topic for further exploration.
Sixth, while the study focuses on integration through physician employment, there are other models that could also have an impact on hospital financial performance. However; the percent of sample hospitals that sponsored one or more of the non-employment physician-hospital integration models during the study period steadily decreased from 40 percent in 2005 down to 34 percent in 2009. These include the IPA, open and closed PHO, MSO, and GPWW. The number of physicians participating in one of these arrangements also declined during the study period. Alternatively, the number of sample hospitals that employed physicians during the study period increased from 515 in 2005 to 607 in 2009, representing a 15 percent increase.

Lastly, despite the increased employment activity during the five-year study period, the relative age of the data may prevent adequately identifying the effect of physician employment on hospital financial performance. According to Kastor (2001), successful integration and financial break-even may take up to seven years. Kocher and Sahni (2011) noted that achieving break-even and positive margins from physician employment may take at least three years to achieve. The data used in the study were nearly four years old at the time of this analysis. Given the increased pace of physician employment, particularly since 2010 and the passage of the Affordable Care Act, there may be a greater impact of employing physicians on hospitals’ bottom line. Despite the potential limitations, the study design is a marked improvement over previous research by separately analyzing the distinct impacts of employing referring physicians on both hospital revenue and expense.

**Conclusion and Recommendations**

The study examines the effects of physician employment on hospital financial performance, a relevant and timely analyses given the prevailing trend of hospitals seeking closer integration with their referring physicians as a critical strategy to sustain or improve their bottom
The increase in the number of hospitals employing physicians and the number of employed physicians in general can largely be attributed to recent health reform and the subsequent movement toward accountable care organizations with the likelihood of increased use of risk-based payment models (Kocher & Sahni, 2011).

It was anticipated that physician employment would be positively related to both net patient revenue and net income from service to patients, while negatively related to total operating expense. The results of study show that hospitals did, in fact, increase revenue with an increased number of employed referring physicians, which is significantly and positively related to net patient revenue. In addition, the change in the number of employed physicians is significantly and positively related to the change in net patient revenue. Assumingly, employed physicians improve hospital revenues by providing more billable services by enlarging the hospitals capacity and patient base.

The study also examines the impact of the number of employed physicians on total hospital expense and the impact in the change in the number employed physicians on the change in total expense. Contrary to the expected observation of reduced expense due to hospitals’ leveraging their influence over physicians’ practice patterns, the number of employed physicians is positively associated with total expense. Due to the positive expense effect outweighing the anticipated positive revenue effect, net income was negatively associated with physician employment.

Previously referenced researchers (Goes & Zhan, 1995; Casalino & Robinson, 2003; Madison, 2004; Berenson, Bodenheimer, & Pham, 2006) argue that employing physicians should elicit their cooperation with the hospital to achieve financial and quality goals through its managerial authority and ability to impose greater control over how services are structured and
delivered, compared to non-employed independent physicians. Other researchers (Sloan & Becker, 1981; Alexander & Morrissey, 1988) contend that hospitals with salary arrangements for non-hospital-based physicians have higher costs which have a negative impact on hospital financial performance. Bujak (2008) presents a noteworthy perspective on influencing physician practice patterns through employment:

Too often, those in positions of governance or administration within healthcare organizations assume that employment is one way to influence and/or control the behavior of physicians. While the terms of monetary reimbursement contained within the physician’s employment contract influences specific behaviors, a commitment to individual professional autonomy transcends employment status and renders the term ‘employed physician’ an oxymoron. Physicians predominantly respond to clinical context and are less influenced by economic or regulatory imperatives. Patient care and self-interest trump all other considerations, and often are in conflict with each other and create tension for the individual physician.

Most new physicians are expected to be employed; 75 percent within the next two years, according to industry recruiting experts (Merritt Hawkins, 2012). Terry (2011) provides several reasons why many will not be employed. He offers the potential lack of job security if a hospital decides to downsize and terminate the physician’s employment. Other reasons include changes in the compensation level or methodology requiring physicians’ increased effort for the same or less compensation, burdensome call schedules often expected of employed physicians, a lack of business control over the physicians’ practice, a lack of clinical autonomy, and the economic threat of non-compete clauses should the physician choose to terminate the employment agreement.

Some physicians may even be entering hospital employment out of the perceived increased survivability; especially with the threat of declining real income and the increasing challenges of managing their practice as a business – a skill set few are taught. The nature of this type of relationship equates to a shotgun wedding-style marriage that has potential for ending in
a bitter break-up, as witnessed by the experience of the previous physician employment trend of the late 1980s and early 1990s. Though the employment models presented to physicians today are likely to have productivity-based compensation incentives; several trends could affect the honeymoon period between hospitals and their employed physicians.

Decreased physician productivity, increased cost of doing business, and decreased reimbursement could force hospitals to ratchet down on their employed physicians. The end result could be hospital employers’ effecting unpopular, albeit necessary, changes with their physician employees; such as requiring them to see more patients, reducing their office support staff, constraining their choice of services and supplies, and limiting capital investment. Other possible scenarios could include wide-scale physician defection in reaction to the cognitive dissonance from hospitals’ attempt to exert tighter control over their practice patterns and the hospitals’ divesting their physician practices, as occurred in the 1990s.

To avoid potential and unpleasant consequences in lieu of an employer-employee relationship, making the physician a strategic partner might better serve the respective goals and needs of both the hospital and the physician. Creating a partnership with physicians reduces the potential for self-interest and risk-aversion through a team approach, rather than creating an agency problem where physicians are put in the untenable Catch-22 of simultaneously pursuing the selfless interest of the patient while being wary or their own rational economic interests (Schramko, 2007). The hallmark of any mutually beneficial partnership is measured by the degree of sharing among the parties – information, governance, and risk or reward.

Information sharing promotes informed and participative decision-making and is based upon two key premises that demystify physician behavior – that physicians are scientists and therefore value accurate and actionable data and physicians are competitive and strive to get
good grades. As Edwards Deming wrote, “In God we trust. All others bring data.” An effective approach for getting beyond physicians’ rebuking of hospital data as inaccurate or not reflective of their relatively ‘sicker’ patients is using comparative internal data and best practices. While a set of physicians may not believe their practice patterns are similar to national average benchmarks that account for a wide variance of physician training, skills, and practice environments; using data that profiles physicians against their peers can be effective, if not powerful, in persuading behavior change.

Within every clinical group, such as a service line or MS-DRG, are providers delivering relatively higher quality, safer, more effective and efficient patient care. By identifying these more resource-efficient practitioners, it is possible to contrast their care delivery pattern with less resource-efficient practitioners to promote peer-to-peer influence and move toward higher quality and more efficient practices. Competitiveness is coded into a physician’s DNA and compels them to dedicate a significant portion of their adult lives to the rigorous academic pursuit of becoming a licensed physician and periodically to recertify in their specialty. Assuming physicians’ acknowledgment of accurate risk-adjusted data, using that data to compare individual performance to their peers should evoke a healthy scientific inquiry in the form of “How is able Dr. Smith able to discharge her patients one day sooner than mine?” Thus begins the critical dialogue required in a physician-driven process to achieve internal best practices that improve quality and eliminate waste and inefficiency.

Sharing governance throughout all levels of the organization promotes a culture of accountability versus a zero sum ‘us and them’ mentality. Giving physicians a seat at the table and empowering them to influence decisions that affect their patients across clinical, operational, financial, and strategic processes and decisions is commonplace across the industry and can take
various forms; including employing physician leaders at the department, service line, or C-suite levels, using a dyadic model pairing physician and administrative leaders, establishing a physician leadership council, and using a contractual arrangement, such as clinical co-management. The latter has grown in popularity over the past decade for engaging both employed and independent physicians in the governance of a particular service line.

The co-management agreement provides pay-for-performance to participating physicians based on the hospital’s achieving specific and pre-determined goals. Pay-for-performance arrangements are receiving increased attention, especially from governmental and other demonstration initiatives aimed at controlling rising healthcare costs while improving the quality of care. These arrangements are intended to meet regulatory guidelines to prevent implications of Stark, anti-kickback, or civil monetary penalty statutes. Physicians are compensated for their time and also for their efforts in the form of a bonus if the pre-determined performance measures are achieved. Co-management underscores the principle of synergy, whereby the individual efforts and expertise of both physicians and the hospital are combined to accomplish their mutual and respective needs and goals. Clinical co-management can be an effective model for integrating physician and hospital management of clinical services.

Sharing financial risk and reward, whereby both physicians and the hospital have ‘skin in the game’ and are therefore incentivized to work together. For example, a previously taboo approach that has enjoyed growing regulatory acceptance, given certain conditions are met, is gainsharing or shared savings – a model borrowed from industry and used extensively by many Fortune 1000 companies.

Gainsharing in health care is a formal arrangement where hospitals share a percentage of savings with physicians through their collaborative efforts to reduce costs. Typical efforts to
reduce increasing supply costs in the hospital administrators’ arsenal often involve limiting physicians’ choice through a formulary or refusing to use higher cost vendors. Such top-down strategies are self-limiting and difficult to implement versus a different approach where physicians might be willing to support negotiating with vendors or limiting their choices to reduce costs if they were engaged in a collaborative process and if they had a financial incentive to reduce costs. Such arrangements are typically built around decreasing the use of hospital resources, improving efficiency, and negotiating better prices on physician preference items (Montgomery, K. & Schneller, E. S. (2007).

Another example of aligning incentives through shared risk is bundled payments. Rather than reimbursing for discrete services, episode-based payments tie multiple providers in separate locations together toward improving care coordination and quality. Bundling payments is intended to create incentives for providers to contain their own costs while working together to better coordinate and improve the efficiency and outcomes of the overall care they collectively deliver.

Finding the common ground between hospitals and physicians presents a significant challenge and inherent opportunity to more closely align the needs and interests of the hospital with their referring physicians. Employing physicians can be an effective alignment strategy, given a clear understanding of the potential consequences. Sharing information, governance, and risk and reward with physicians will enable hospital leaders to develop and sustain a strong foundation for improving the quality of care in a cost-effective environment.
References


