ECONOMIC ANALYSIS OF HEALTHCARE COST STUDIES COMMISSIONED BY BLUE CROSS BLUE SHIELD ASSOCIATION

February 25, 2003

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ECONOMIC ANALYSIS OF HEALTHCARE COST STUDIES

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I.   Introduction and Overview

This economic report (Economic Report) was commissioned by the American Hospital Association (AHA) and conducted by Margaret Guerin-Calvert and Economists Incorporated to: (1) evaluate several empirical studies conducted on behalf of the Blue Cross and Blue Shield Association (BCBSA) that examine factors that increase healthcare spending, and (2) assess the findings of these studies and the policy conclusions the BCBSA drew from them. In particular, the Economic Report focuses on the BCBSA's claims that hospital "consolidation" and "restructuring" of hospital markets[2] have contributed substantially to increased hospital expenditures as well as to overall healthcare (premium) cost increases.[3]

The major conclusions of the Economic Report are:

- **There is no valid empirical basis for the conclusion reached in the BCBSA studies that changes in market structure or "consolidation" have accounted for increases in spending on hospital services.**

- **Based on a review of actual merger data and trends, hospital merger activity does not explain the increases in spending on hospital services claimed in the BCBSA studies.**

- **Increases in spending on hospital services are explained by many factors, such as increased patient volume and the rising costs of providing care, rather than "consolidation" and changes in market structure.**

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[1] This report reflects the work of Margaret E. Guerin-Calvert, Principal, Competition Policy Associates, Inc. and Economists Incorporated (David Argue, Paul Godek, Barry Harris, Stephanie Mirrow, and Jennifer Bartels).

[2] Hospital "consolidation" and "recent restructuring of the hospital market" are not clearly defined in the BCBSA studies. Different measures of consolidation are used across and within the studies with varied types of "consolidation," including mergers, acquisitions, formation of systems (including single hospital systems), hospital closures due to failure, and consolidation of hospital facilities into fewer hospital facilities (with and without a change in ownership).

[3] The BCBSA summary states that "18 percent of rising inpatient costs are related to hospital consolidation, with every 1-percent increase in market share due to consolidation leading to a 2-percent increase in inpatient expenditures" and that "consolidated systems received 12% higher payments per discharge when compared to local independent hospitals."   See, www.bcbshealthissues.com/costpressconf/execsum (11/13/02), p. 2.

- **Spending on hospital care has declined as a percentage of overall healthcare expenditures. Of the increase in healthcare spending (from 1999-2001), 70% was from sources other than hospital services. Some non-hospital sectors, such as pharmaceuticals, experienced larger percentage increases.**

This Economic Report is organized in the following way: Section II presents an evaluation of the BCBSA's studies assessment of the relationship between "market structure" and hospital payments. Section III examines recent merger trends as a "cross-check" on the findings of the BCBSA studies. Section IV then presents a brief summary of current data and information, including from the BCBSA' studies, concerning the factors driving hospital expenditures. Section V examines trends in overall healthcare spending and evaluates the role played by spending on hospital care.

II.   Review of the BCBSA Studies Concerning Structure and Hospital Expenditures

Overview

The BCBSA commissioned seven studies on healthcare costs that were released October 23, 2002.[4] Six of these studies examine the hospital sector (both inpatient and outpatient) and one addresses the physician sector. The studies focus primarily on the period 1998 to 2001. Generally, these studies are empirical analyses that attempt to identify and estimate the contribution to healthcare expenditures of a number of different factors. The factors include inputs into the provision of hospital services, such as labor and nursing services and pharmaceuticals. Some of the studies attempt to quantify the effect of changes in one or more factors (e.g., improved technology or pharmaceuticals) on expenditures, and still others attempt to estimate the effect of a variety of structural or organizational changes in these sectors, such as mergers, acquisitions, and system development, on spending on hospital services. While the studies collectively identify non-structural factors as accounting for the majority of recent increases in spending on hospital services, the BCBSA Executive Summary and accompanying press release identified the "impact of hospital consolidation and the recent restructuring of the hospital market" as a "key driver" of increased spending on hospital services.[5] The

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[4] With one exception (a study that focused on physician services), the BCBSA studies focused largely on inpatient and outpatient hospital care. The studies include: Joel Hay, PhD, Sharon Forrest, MSc, Mireille Goetghebeur, PhD, **Executive Summary Hospital Costs in the US**, (October 15, 2002); Nancy M. Kane, DBA, **Analysis of Hospital Strategy and Financial Health**, (April 25,2002); Nancy M. Kane, MBA, DBA, Richard B. Siegrist, Jr., MS, MBA, CPA **Understanding Rising Inpatient Costs: Key Components of Cost and the Impact of Poor Quality**, (August 12, 2002); Joel Hay, **Hospital Cost Drivers: An Evaluation of State-Level Data**, (October 15, 2002); Sharon Forrest, MSc, Mireille Goetghebeur, PhD, Joel Hay, PhD, **Forces Influencing Inpatient Hospital Costs in the United States**, (October 16, 2002); The Lewin Group, Inc., **Study of Healthcare Outpatient Cost Drivers**, (October 16, 2002); The Lewin Group, Inc., Drivers of Healthcare Costs Associated with Physician Services, (October 16, 2002);

[5] http://bcbshealthissues.com/costpressconf/execsum (11/13/02), p. 1.

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BCBSA summary concludes that "18 percent of rising inpatient costs are related to hospital consolidation, with every 1-percent increase in market share due to consolidation leading to a 2-percent increase in inpatient expenditures" and that "consolidated systems received 12% higher payments per discharge when compared to local independent hospitals."[6]

This conclusion is based primarily on the findings of the study by Joel Hay (the Hay study). The implication is that but for hospital consolidation activity, these spending increases would not have occurred.

We undertook a thorough economic evaluation of the Hay study and its findings with respect to consolidation. We also reviewed the five other studies that examined the sources of increased expenditures on hospital services in recent years; summaries of these are found in the appendix to this report. In conducting that evaluation, we reviewed the individual studies and the analyses and data therein, developed and analyzed data from public sources, and were provided with data and information from the American Hospital Assocation on a number of major trends in the hospital sector.

We concluded based upon that review that there was no valid empirical support for the claims of the BCBSA studies that consolidation and changes in hospital market structure explained the increases in spending on hospital services. In contrast, we found increased hospital costs and increased demand for services (including increased volumes of patients) explained this increase. This assessment was also supported by the other empirical studies commissioned by BCBSA as well as by the data in the Hay study. [7]

The BCBSA Executive Summary notes that the "market structure" aspect of inpatient services is very complex – with much of the consolidation occurring due to the historical and projected closures of financially distressed hospitals and the fact that close to 70% of hospitals in "competitive" markets may not have financially sustainable performance in 1999-2000.[8] Moreover, some forms of consolidation such as network formation may be

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[6] http://bcbshealthissues.com/costpressconf/execsum (11/13/02), p. 2.

[7] The BCBSA summary identifies other factors that contribute to the inpatient cost increases – the largest contributor is from hospital wages, with 20% of the cost increases attributed to such costs (and particularly to the effect of shortages in nursing staff). Other sources of cost increases include "underutilization" of hospitals (15%), and population income (10%). The summary references statistics presented in the "Executive Summary Hospital Costs in the US" (15 October 2002) by Joel Hay, Sharon Forrest, and Mireille Goetghebeur, which are presented graphically at p. 8 of the Executive Summary. This chart, however, excludes the cost increases associated with pharmaceuticals, which are listed separately at p. 13 of the Executive summary as representing 14% of the increase in inpatient costs in 2000 (citing the Kane and Siegrist study "Understanding rising inpatient hospital costs: key components of costs and the impact of poor quality"). This suggests that an important contributor of inpatient cost increases may have been left out of the summary statistics at page 8, suggesting that each of the reported inpatient cost increase factors had a lesser effect. http://bcbshealthissues.com/costpressconf/execsum (11/13/02), pp.1-2.

[8] Joel Hay, Sharon Forrest, and Mireille Goetghebeur "Executive Summary Hospital Costs in the US" (15 October 2002) at pp.10-11.

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associated, according to the Executive Summary, with reduced rather than increased costs.

Our review in this section starts with the Hay study on which the BCBSA bases its claim that 18 percent of inpatient spending is due to consolidation. That study purports to draw a casual relationship between changes in "market structure" and increased spending on hospital services. This study is flawed and does not support the conclusions drawn by the BCBSA. The following provides a summary of the particular issues with the Hay study, starting with a brief summary of the study's methodology.

Review of Joel Hay Study: "Hospital Cost Drivers: An Evaluation of State Level Data"

The study "Hospital Cost Drivers: An Evaluation of State Level Data" by Joel Hay (the Hay study) attempts to identify and quantify the importance of factors that affected expenditures on inpatient hospital services since 1998. Although the Hay study identifies a large number of factors that influence expenditures on hospital care, it specifically focuses on some that the author believes are most amenable to changes in public policy. Among these policy factors is "hospital market structure." While the Hay study provides some useful information on trends in hospital costs at the state level, it does not provide a sound basis for antitrust policy or predictions about the relationship between market structure and prices.

Data and Methodology

The Hay study uses data from two sources. One data set contains state-level information on demographics, income and socioeconomic status, incidence of disease, healthcare access, and other variables from a representative population for 1990-1999, collected primarily from official government sources. The second data set is drawn from a large commercial health insurer and includes information on 3.2-3.5 million members per year from every state and the District of Columbia. This data set has a limited number of demographic variables, but is the source for the estimated state-level expenditures used as the dependent variable. The commercial health insurance data cover a period from the fourth quarter of 1998 through the first quarter of 2002. Despite the size and comprehensive nature of the data used in the study, the data sets have shortcomings that limit the usefulness of the results for explaining more recent healthcare trends.[9]

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[9] The Hay study states that the common time period covered by both data sets is 1999 and 2000 (although that is somewhat difficult to reconcile with the fact that the Hay study indicates that the government data base does not extend beyond 1999). As the study states, "most of these variables [from the state-level data], particularly the crucial dependent variable for our analysis (inpatient expenditures by state) are only currently available through the year 1999. A second drawback to the data is that the state-level data on healthcare expenditures are not separated into the categories of expenditures desired for the study. The data include combined figures for inpatient and outpatient expenditures, rather than the separate inpatient expenditures upon which the study focuses. Thus, the Hay study is compelled to use inpatient expenditures derived from the aggregate figures. The derivation of these inpatient expenditures apparently was performed

In an effort to overcome the lack of recent expenditures information in the public data, the Hay study relies on the health insurance database to develop the "policy-relevant" findings and the state-level data to "establish and confirm the significance of broad categories of explanatory variables." This is accomplished in the study through a series of econometric steps that call into question the reliability of the reported results. These econometric issues, while important, are secondary to the issues raised by the failure to define relevant markets or measures of competition. The "conceptual" issues of markets are addressed first.

Conceptual Issues

The study does not attempt to identify any well-defined antitrust markets nor does it use any valid market share or concentration measures. The study relies on state-level data and fails to recognize that state boundaries do not define relevant antitrust markets. Both federal antitrust agencies and the courts have concluded that it is appropriate to analyze the competitive effects of hospital mergers for most inpatient services in more local markets.[10] The Hay study, however, implies that the hospitals in New York City, for example, are in head-to-head competition for all inpatient services with hospitals in Buffalo. The Hay study includes no measures of concentration, which are the starting point of a Merger Guidelines analysis.[11]

The study does not measure the effect of changes in hospital market structure and changes in spending over time; rather it examines differences in the level of hospital expenditures across states at a point in time. While even this analysis is flawed for the reasons set out below, such an analysis cannot be used to infer that a particular change in structure will lead to a particular change in expenditures.[12] The study is based largely on

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by the Lewin Group using the CMS Hospital Cost Reports. That analysis, which is not detailed in the Hay study, uses actual data for 1996-1999 and estimated data for 1994-1995.

[10] For some services, such as invasive cardiac procedures or other tertiary services, the agencies have also used broader regional markets depending on the facts of the particular case.

[11] The Merger Guidelines uses the Herfindahl-Hirschman Index (HHI) as a useful starting point for predictions of competitive consequences from a merger. Concentration measures like the HHI are typically included in empirical studies of market structure. The Hay study, however, measures only the average share of beds in the state owned by hospital systems or by for-profit entities. That measure, which itself is a mix of variables, cannot account for what is often thought of as a competitively significant difference between a large share of beds owned by one system (i.e., a high HHI) and the same share split among several smaller systems (i.e., a low HHI). In addition, the HHI is intimately related to market definition. An HHI calculated in an improperly defined market has no meaning. The Hay study's system-ownership measure has no ability to gauge increases in system ownership over time, a factor that presumably would bear on his results. Thus, if the extent of system ownership had remained unchanged since 1990, for example, the Hay study's analysis would still conclude that system ownership caused a significant portion of the expenditures increase in the 1998-2002 period.

[12] The Hay study considers the same type of question as that found in the structure-conduct-performance literature – using cross-sectional data to ask whether there is a relationship between inpatient hospital expenditures and a concentration factor (e.g., percent of hospitals in a system

a cross-sectional comparison between states. As such, it has no ability to address the underlying issue of why hospital expenditures increased rapidly in the late-1990s relative to earlier time periods. It does not consider, for example, whether the states that had high expenditures in 1999-2000 also had high expenditures in the early-1990s.

The measure of "market" structure that is employed in the study does not provide any indication of "competitiveness" in hospital markets. It does not measure the number or the shares of independent firms in any well-defined market. Instead, it uses an aggregate measure that does not account for either the number of beds held by each independent system or the number of independent hospital systems. As a result, there is no valid basis for the Hay study's conclusion that past consolidation has led to higher expenditures on hospital services.

The study mistakenly assumes that differences in the "market structure" measures across states have competitive significance. The "market structure" or "concentration" measures used in this study could vary across and within states even if there were no mergers or acquisitions, for example – closure of a single hospital within a system would result in a lower "structure" measure. Similarly, the decision of a single hospital in a state to form a system would result in a higher "structure" measure. Finally, inclusion of a hospital in one city into a system located in another city in the same state would increase the "structure" measure, even if the hospitals in the two cities do not compete. The composite measure for a state will reflect all of these possibilities, as well as mergers and acquisitions in the same city. As a result, the "concentration" measure used in the Hay study is not a meaningful predictor of the likely effects on hospital expenditures or any other performance measure.

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that are for-profit). Several authors, including Paul Pautler, "Evidence on Mergers and Acquisitions," FTC working paper (2001), Barry Harris and David Smith, "The Merger Guidelines vs. Economics: A Survey of Economic Study," American Bar Association Section of Antitrust (1995), and Ranjani Krishnan, "Market restructuring and pricing in the hospital industry," Journal of Health Economics 20 (2001) 213-237, conclude that this methodology does not provide for a direct test of the effects of mergers. Pautler states that the structure-conduct-performance methodology focuses more on the question of whether market concentration matters (the relationship between concentration and profit or concentration and price), not on whether increases in market concentration due to horizontal mergers matter.) Krishnan notes that most of the prior studies in the economic literature on hospital mergers (with the exception of Connor R.A., Feldman R.D., Dowd B.E., Radcliff T.A., "Which Types of Hospital Mergers Save consumers Money?" Health Affairs, 16 (6) 62-74 (1997) and Connor, Feldman, Dowd, "The Effects of market concentration and hospital mergers on hospital costs and prices," International Journal of Economics 5 (1998) 159-180) are cross-sectional studies of the relationship between price and a measure of concentration, such as the Herfindahl index (D. Dranove, M. Shanley, W. White, "Price and competition in hospital markets," Journal of Law and Economics, 36 (1993) 179-204; W.J. Lynk, "Nonprofit mergers and the exercise of market power," Journal of Law and Economics, 38 (1995) 437-461). Longitudinal studies, if they could control appropriately for all of the relevant factors that affect price, may provide a more direct test of merger effects. (See Krishnan, 2001, Page 216)

The study does not differentiate between price and utilization effects. The Hay study recognizes the problem that is inherent in any study of healthcare expenditures—distinguishing price changes from utilization changes. As the Hay study states: "In a field of rapidly evolving technology like medical care, it is very difficult to partition expenditure increases neatly into these two components."[13] In lieu of attempting to address the "controversial" separation of price and utilization effects, the Hay study evaluates overall expenditures. The inability to separate the two effects, however, undermines the Hay study's conclusions as far as they pertain to antitrust issues. Price increases (as well as quality decreases) are well within the domain of an antitrust analysis, but utilization changes can obscure changes in price or quality, thus limiting the applicability of an analysis of overall expenditures.[14]

<div align="center">Econometric Issues</div>

The study uses a flawed regression analysis, which in itself provides no empirical support for its conclusion that hospital consolidation accounted for 18 percent of increases spending on inpatient services.

- **Flawed econometric approach.** A serious econometric problem with the Hay study involves how the econometric model is determined. Dozens of state-level factors, including various measures of demographics, health status, health insurance attributes, provider supply and organization, provider payment and operating costs, healthcare regulation, medical technology, and economic variables, were considered in the Hay study. Because the number of explanatory variables was greater than that which could be accommodated by the data for both state-level and the health insurance company data, the Hay study undertook stepwise regression processes to exclude from the final regression analysis those variables that did not contribute enough explanatory power. The Hay study notes that "stepwise regression methods have been criticized because there is no guarantee that the final model specification is fully correct, and therefore the resulting estimates may be subject to omitted variables bias."[15] Stepwise

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[13] Hay Study, p. 6.

[14] For example, increased use of a particular procedure or drug without a price increase would increase overall expenditures. Such an increase in expenditures would have no relevance for an antitrust analysis. In addition, the study does not account for the possibility that an increase in hospital expenditures may be caused by an increase in the quality of care, an element for which the study has no measure. It also cannot account for more complex trade-offs in which "expensive" high-tech care results in avoided hospital stays. For example, the incidence of coronary artery bypass graft surgery may be reduced by the use of arterial stents. In sum, the Hay study does not take into account the effect of increased utilization or improvements in quality, yet both of these are relevant to a clear understanding of the antitrust questions of market structure. A more complete conclusion about the effects of market structure or any other factor on hospital expenditures should take these factors into account.

[15] Hay Study, p. 9. While there are advantages to stepwise regressions, the Hay study notes that their results should be considered "exploratory" rather than definitive. The results of the Hay study are reported in the "Executive Summary: Hospital Costs in the US." Among those results is the claim that 18 percent of the increase in inpatient hospital expenditures is attributable to

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regressions have been generally discredited as blatant examples of the "specification search," the problems of which were identified and analyzed by Edward Leamer.[16] An involved search for a specification (in which many different models are tested sequentially and the final model choice is determined by the data itself) can negate the inferences one can draw from the resulting model. As Leamer notes:

> "The fact that the process is data-dependent obviously has consequences for the interpretation of the final result of the data-selection search. It seems clear that when the data evidence is partly spent to pick a data set, the regression equation that is finally selected to convey the data evidence at least overstates the precision of the evidence and likely distorts it as well."[17]

The Hay study's problem of having many more potential dependent variables than he can use, given the number of observations, can be addressed by using economic theory to limit the number of dependent variables or by finding more data. Instead, the Hay study chooses to maximize the R-squared, subject to some unstated side constraint on the ultimate number of independent variables he will use. The result of this approach is a model with unknown and unknowable statistical properties.

- **The Hay study also relies on what he calls "variance component factors" to reduce the number of explanatory variables.** This is an obscure though acceptable econometric method, more commonly referred to as "principal components."[18] Principal components involves the transformation of the independent variables into a new set of variables that are pairwise uncorrelated, but which have much of the variation of the original set. In standard regression analysis, principal components can be used to deal with the situation of a large number of highly correlated independent variables relative to the sample size. When applying the principal component approach in this case, two things should be kept in mind. First, the coefficients on the transformed variables have no

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"market structure" discussed previously. With regard to the finding based on the individual coefficients that a 1% increase in the market structure variable produces a 2% increase in inpatient hospital expenditures, the Hay study itself indicates that a focus on the individual coefficients is inappropriate. The Executive Summary also characterizes some of the Hay study findings differently from the way they are presented in the study itself. For example, the Executive Summary states that "hospital market & finances" is one of the key drivers of recent increases in inpatient expenditures. The Executive Summary describes "hospital market & finances" with the terms "competitive markets", "hospital closures", and "profit vs. non-profit." Only the last of these is actually examined in the Hay study. The study does not even measure hospital closures, and makes no specific conclusions about competitiveness of markets.

[16] E. Leamer, *Specification Searches, Ad Hoc Inference with Non-Experimental Data*, John Wiley & Sons, 1978.

[17] Leamer, p. 259.

[18] See J. Johnston, *Econometric Methods*, Second Edition, McGraw-Hill, 1972, at Chapter 11.

obvious interpretation, beyond their statistical significance.[19] Thus, while principal components is a more benign method compared to the stepwise regression method described above, it does not provide any interpretive results. In addition, using principal components does not resolve any of the other data issues discussed above. The variable definition problem and the ad hoc specification search (discussed above), as well as the simultaneous equation problem and the time-series/cross-section problem (discussed below) still remain.

- **Failure to account for possible simultaneous relationships between variables.** Hay's study also does not take into account the possible simultaneous relationship between the market structure variables and the dependent variable. It is not clear whether the share of hospitals that are system-owned affects inpatient hospital expenditure, or inpatient hospital expenditures affect the share of hospitals owned by a system, or both. That is, are system-owned hospitals more likely to exist in circumstances in which inpatient hospital expenditures are higher. Possibly, both of those relationships are determined by other factors. Hay's reduced form regression assumes that market structure is endogenous. That assumption is directly analogous to the original profits-concentration debate. Concentration was assumed to determine profits, until economists began to realize that concentration does not arise spontaneously, it is endogenous to a variety of factors that determines both concentration and profits. Just as concentration is not endogenous, neither is system ownership of hospitals. For example, if urbanization affects both inpatient hospital expenditures and system ownership, then one might find the relationship between expenditures and system ownership, even if one controls for urbanization in a reduced-form model. A simultaneous equation approach should be used, or at least there should be an explanation of why the reduced form approach does not involve a simultaneous equation bias.

- **Time series implications derived from cross-section analysis.** It is also well understood in econometrics that one should not draw time-series implications from cross-section analysis. Just because two variables, x and y, are positively related across states does not mean that increasing x will lead to an increase in y over time. There is no reason to presume that the time-series relationship will exist to the same magnitude or even in the same direction as the cross-section relationship. Econometrically, the issues are quite distinct. For example, there may be a strong relationship at the state level between income and expenditure on health care, which is driven by large differences in income across states (income levels in Maine are much higher than Arkansas). The average cross-section effect may be one-to-one, so that 1 percent more income is associated with 1 percent more expenditure on health care. An increase in income across the country of 1%, however, will not necessarily result in a 1% increase in nationwide health care expenditures. For example, increases in income might have much less of an effect on health care expenditures in high income states than in low income states. If

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[19] As Hay admits (p. 8) "While factor analysis confirmed the overall significance of the different groups of variables included in the stepwise regression, the variance components developed with factor analysis do not have obvious policy meaning."

that were true, then there will be a less than proportional increase in high income states and the overall increase in the country will be less than 1%. The effect over time within any given state can be far different from the cross-section effect across any one state or all of the states together.

The 18 percent number is additionally flawed by the unsound methodology that was used to derive the estimate from the regression results, which included among other elements, adding together disparate factors into composite measures, and assuming all factors "were to increase by an equal percentage" so as to cause healthcare expenditures to increase.

- **Derivation of the 18 percent and other expenditure shares are based on flawed methodology and assumptions counter to fact.** Figure 6 of the Hay study purports to show a summary of the relative "expenditure growth contributions" of all of his variable groups, which includes the 18% figure attributed to market structure. These percentages are derived from the regression coefficients shown in Table 10. Even if one were to ascribe some significance to the regression analysis, these expenditure growth contributions shares are not meaningful. The Hay study does not explain how he derives the 18% figure, or any of the other percentages for that matter, and we are unable to replicate the exact figures arrived at. The Hay study appears to (a) sum the coefficients within his explanatory groups (although it is unclear whether he allows positive and negative signs to cancel or deletes variables with "wrong" signs), (b) recast the grouped variables, as necessary, so that the combined coefficient is positive and (c) calculate those within-group sums as a percentage of the total of all of the coefficients.
- The combined variables that the Hay study creates for econometric purposes are collections of individual variables that ostensibly have economically meaningful relationships. The four most important factors, which the study finds together account for 72% of the growth in inpatient hospital expenditures, are medical wages (20%), hospital technology (19%), market structure (18%), and hospital underutilization (15%). The Hay study characterizes these shares as the proportional contribution of each group in the event that all of the independent variables increased by equal percentage. This is a technique that was expressly critiqued in the Lewin Group study.
- The Hay study notes that Figure 6 "shows the percentage of total inpatient expenditure growth that would be attributable to each of these groups of factors if all factors increased equally by one percent."[20] It is inappropriate to claim, as the Hay study does, that market structure changes accounted for 18% of expenditure growth. Rather, even if one accepts the Hay study's faulty regression analysis and calculations, a more appropriate interpretation of his result would be that market structure changes would account for 18% of expenditure growth if it and all other factors increased by the same percentage. Increasing all factors by the

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[20] Hay Study, fn. 24.

same percentage is, itself, a distortion.[21]   The expenditure shares derived are largely a function of how many variables were included within each group. For example, the contribution of population to expenditure growth would be a function of how many population variables were included in the initial set of variables. That sort of procedure is ad hoc and unjustifiable. No economic or policy significance should be attributed to these calculations.

- Although the study notes that two-thirds of the growth in overall expenditures is attributable to growth in expenditures for outpatient and pharmaceutical services, the study focuses entirely on the growth of inpatient hospital expenditures.[22] Consequently, the contribution of any factor identified by the Hay study to the increase in overall health care expenditures must be scaled for the share of the overall figure accounted for by inpatient hospital services. For example, the Hay study claims that 18%[23] of the growth in inpatient hospital expenditures is accounted for by "market structure" and that inpatient hospital services account for about 34% of overall health care expenditures[24]. To the extent that those calculations are correct, the Hay study would claim that about 6% of the increase in overall healthcare expenditures would be attributable to the effect of market structure on inpatient hospital services; such a conclusion, however, would still not be valid.

In summary, the foregoing set out a number of the issues associated with the Hay study. The study does present two large data bases that have a rich variety of information on a wide variety of cost data and demographic information. Additional analysis of these data might prove to be productive. As the Hay study notes, a useful additional research project may be to conduct an investigation of healthcare expenditures issues at a more detailed level rather than the state level of Hay's study. The conclusions reached by the Hay study regarding the impact of "market structure," however, are not relevant from an antitrust perspective. Despite the use of the term "market structure," the Hay study examines neither markets nor structure. Without a more appropriate antitrust-based analysis and a sound regression methodology, the Hay study's conclusion that 18 percent of the growth in inpatient hospital expenditures is attributable to a mixture of statewide system ownership and for-profit status is not valid and should not be used to formulate antitrust policy.

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[21] This assumption runs counter to well-known facts in several instances. Hay assumes that the birth rate is increasing; it is decreasing. Hay assumes that the rate of smoking is increasing; it is decreasing. Hay assumes that the percent of beds in networks is decreasing; it is increasing. Hay assumes the occupancy rate is decreasing; it is increasing.

[22] The Hay study finds that inpatient hospital expenditures per member of a large, national health insurance plan increased by 5.9% annually in 1998-2001. Prescription drug expenditures increased by 11.1% annually and outpatient expenditures increased by 15.0% annually over the same time period.

[23] Hay's econometric analysis results in an aggregation of explanatory variables with system ownership and for-profit status being combined to create what Hay characterizes as "hospital market structure."

[24] Hay study, p. 3.

III.   Cross-Checking the Hay Study's Results With Merger Trend Data

The Hay study provides no sound empirical basis for concluding that hospital consolidation over the period studied has been a factor in overall increases in hospital or healthcare spending. Further, the Hay study is inconsistent with the review of merger data and trends.

Hospital merger activity, whether measured by facilities involved or number of transactions, decreased from 1999-2001, both in total and as a percentage of hospitals. In 2000 and 2001, fewer than 6 percent of hospital facilities were involved in a transaction. The following chart compares the number of hospitals in each year with the number involved in a merger or acquisition.
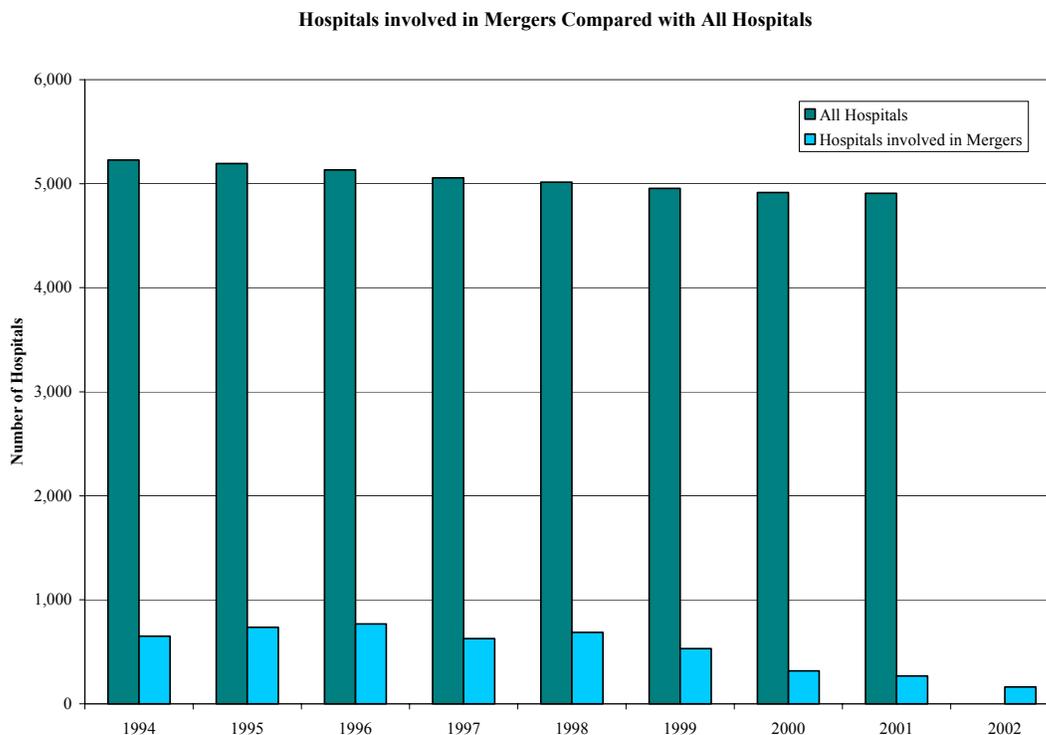
**Hospitals involved in Mergers Compared with All Hospitals**

Source: Analysis of American Hospital Association Annual Survey data for community hospitals; Modern Healthcare.

The statistics used for the above chart and the following ones were developed by reviewing a number of sources on hospital merger activity. While the numbers vary to some extent, the findings are consistent. The most comprehensive historical data were available from Modern Healthcare, which reports hospital merger and acquisition activity measured both by transactions and facilities for the period 1994 through part-year 2002.[25] The following chart depicts the number of individual merger and acquisition "deals" for

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[25] Similar patterns are found in data compiled by Irving Levin Associates, who report 110 transactions in 1999, 86 in 2000, 83 in 2001 and 48 in 2002. The data presented here are based on hospital transaction by year announced (Modern Healthcare's By the Numbers, December 23, 2002 at p.6)

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each of these years. As the chart shows, the number of transactions peaked in 1996 at 235 and has declined steadily each year to a low of 60 in 2002. The number of transactions in 2001 was less than half of the number in 1996 and declined even further in 2002.

Hospital Merger Activity - Number of Deals
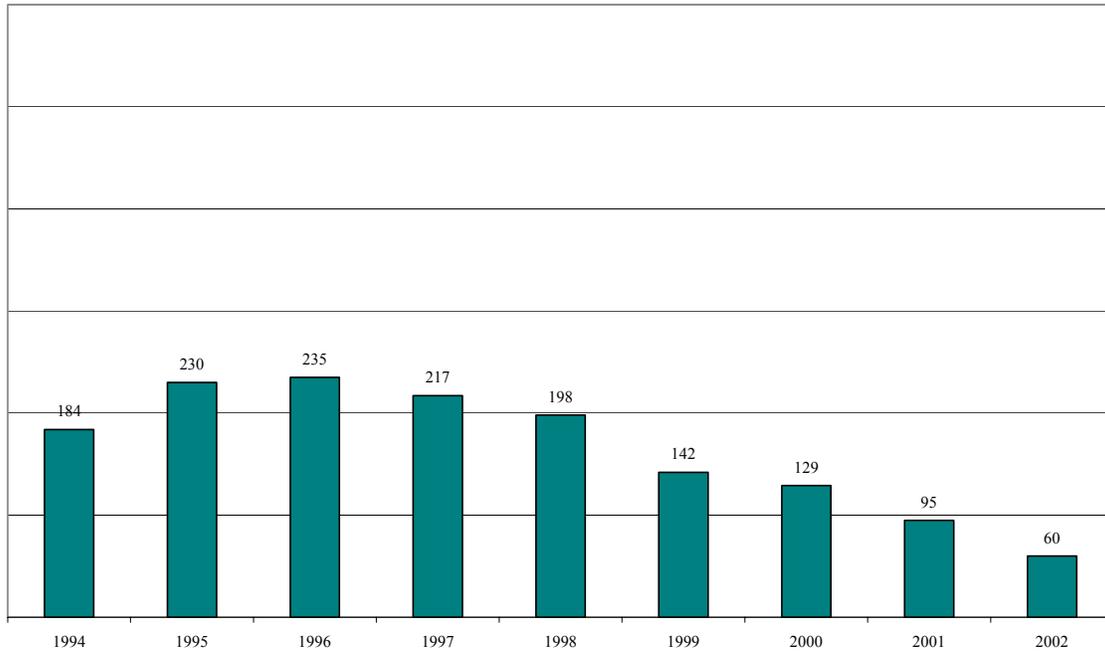
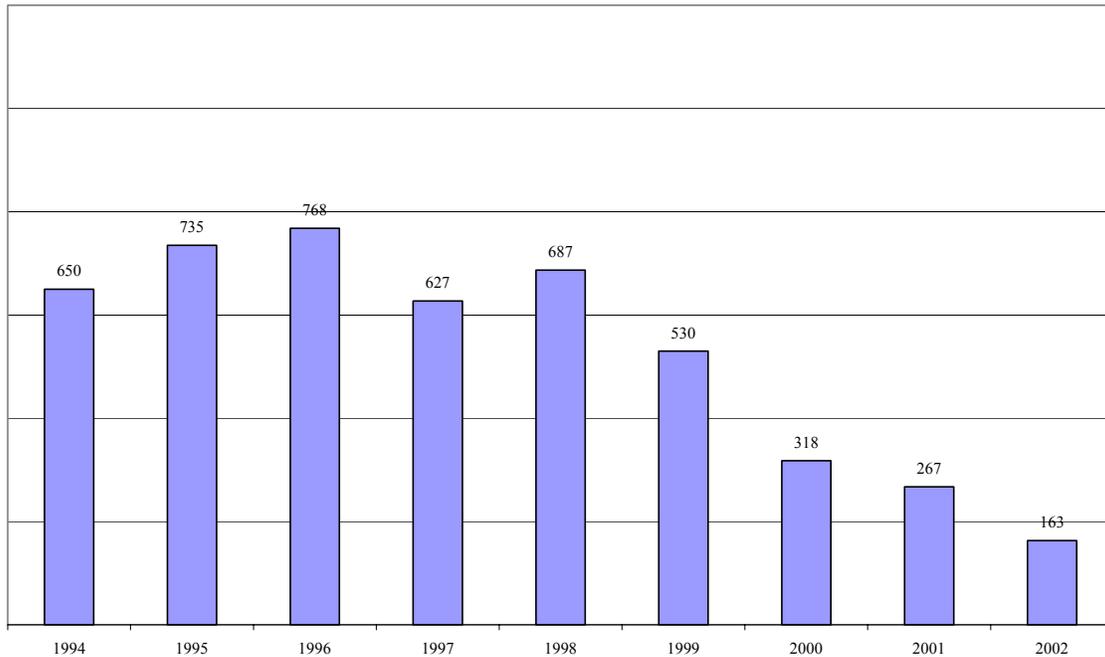|								
184	230	235	217	198	142	129	95	60
1994	1995	1996	1997	1998	1999	2000	2001	2002

Note: Includes deals completed and pending in 2002. Includes mergers, acquisitions, joint ventures, long-term leases and other partnerships.

Source: Modern Healthcare staff reports; Modern Healthcare, January 28, 2003; Modern Healthcare, January 11, 1999.

The pattern of merger and acquisition activity as measured by the number of facilities involved follows that of the deals – the peak is reached in 1996 with 768 facilities. In general, the number of hospitals involved in transactions has tended to decline each year since 1996, with substantially fewer facilities being involved in mergers in the years 2000, 2001 and 2002.[26]

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[26] Other sources that track hospital merger and acquisition activity and were reviewed include: Irvin Levin Associates, reported in Modern Healthcare, and the AHA.

Hospital Merger Activity - Facilities Involved

|								
650	735	768	627	687	530	318	267	163
1994	1995	1996	1997	1998	1999	2000	2001	2002

Note: Includes deals completed and pending in 2002. Includes mergers, acquisitions, joint ventures, long-term leases and other partnerships.

Source: Modern Healthcare staff reports; Modern Healthcare, January 28, 2003; Modern Healthcare, January 11, 1999.

Aggregate downward margin trends in the hospital field over the same period (and for the 5 preceding years) are inconsistent with findings that merger activity has led to substantial profits. These downward trends are consistent with findings that increased expenses and not increased revenues have driven increased spending on hospital services.[27]

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[27] The PricewaterhouseCoopers study "Cost of Caring: Key Drivers of Growth in Spending on Hospital Care" (February 19, 2003) examines the sources of expenditure increases that stem from volume and input cost changes.

Trends in Hospital Mergers and Margins
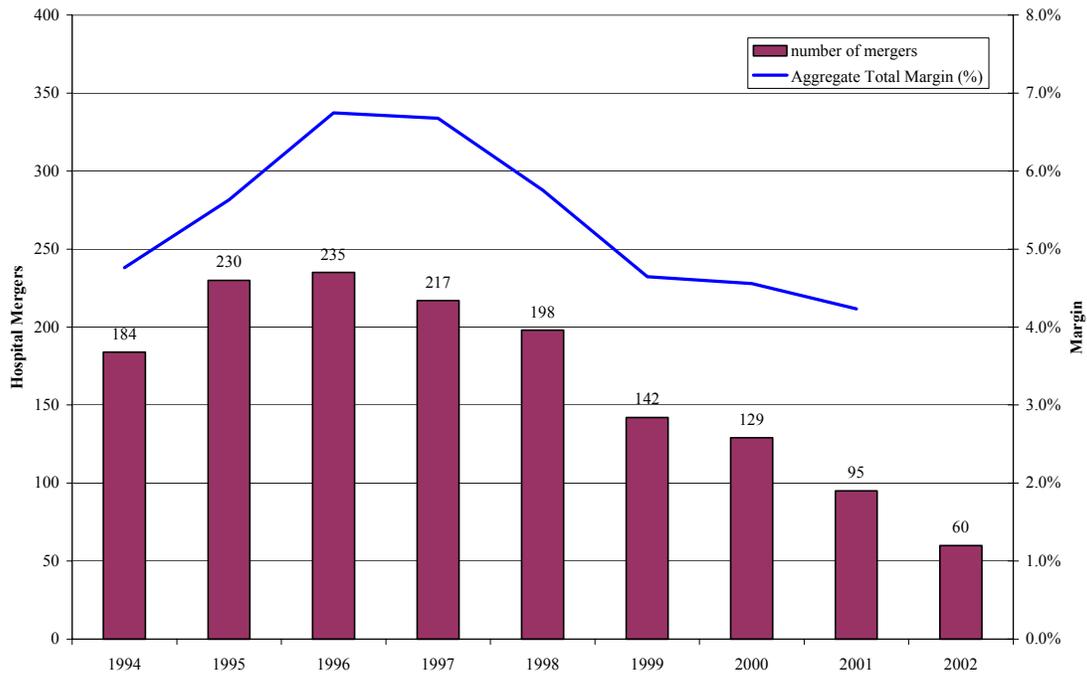
Source: Analysis of American Hospital Association Annual Survey data for community hospitals; Modern Healthcare.

Fewer than 10 percent or 450 hospitals facilities have been involved in a merger since 1999. It is inconceivable that increased spending on hospital services at these facilities could account for the 18 percent increase in spending on hospital services that the Hay study imply are merger related**.** To put this problem with the Hay study in context, hospital care expenditures increased by $57.5 billion between 1999 and 2001; 18 percent of this increase would be about $10 billion.[28]

Even this unrealistically high value significantly understates the problems with this result of the Hay study. A very large proportion of the mergers shown in the chart raise no competitive issues because they involved hospitals with small market shares or hospitals in different product or geographic markets. Mergers that were regarded as potentially raising anticompetitive issues by the antitrust agencies, as detailed in their statements, represent a very small fraction of the consolidation activity shown in the chart above and, therefore, at most could account for only an insignificant fraction of increased spending on hospital services. According to the *Statement of Department of Justice and Federal Trade Commission Enforcement Policy on Mergers among Hospitals*:

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[28] The $57.5 billion in increased expenditures is based on the Centers for Medicare and Medicaid Services, Office of the Actuary, National Health Statistics Group data, and represents the overall increase in expenditures on hospital care; inpatient care expenditures represent a portion of this total. The Hay study is not clear as to the origins of the expenditure increases due to merger. If the assumed source of increased expenditure is price increases, the 18 percent estimate (the BCBSA interpretation of the Hay study's findings) implies an unrealistically high increase in the prices charged to commercial insurers.

"Antitrust challenges to hospital mergers are relatively rare. Of the hundreds of hospital mergers in the United States since 1987, the Agencies have challenged only a handful, and in several cases sought relief only as to part of the transaction. Most reviews of hospital mergers conducted by the Agencies are concluded within one month."[29]

Moreover, there have been relatively few hospital mergers actually challenged in the last five years.[30]

The merger activity that occurred during the period reflected in the chart above was part of a complex period in which significant numbers of hospitals experienced poor financial performance (and in some cases, even closed) and all faced increased pressure to improve services and facilities. The BCBSA studies, for example, note that 70 percent of hospitals in so-called "competitive" markets may not have financially sustainable performance in 1999-2000.

Other trends during the same period, such as increased input costs and increased utilization of services help explain hospital performance and spending trends. See Section IV for a more detailed discussion of these trends.

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[29] http://www.usdoj.gov/atr/public/guidelines/0000.htm#CONTNUM_8.

[30] These include challenges by the DOJ, the FTC or a state: *California v. Sutter Health System, 130 F.Supp.2d 1109 (N.D. Cal.), aff'd, 217 F.3d 846 (9th Cir. 2001); FTC v. Tenet Healthcare Corp., 17 F. Supp. 2d 937 (E.D. Mo. 1997), rev'd, 186 F.3d 1045 (8th Cir. 1999); United States v. Long Island Jewish Med. Ctr., 983 F. Supp. 121 (E.D.N.Y. 1997); FTC v. Butterworth Health Corp., 946 F.Supp. 1285 (W.D. Mich. 1996), aff'd, 121 F.3d 708 (6th Cir. 1997); FTC v. Freeman Hospital, 911 F. Supp. 1213 (W.D. Mo.), aff'd, 69 F.3d 260 (8th Cir. 1995); United States v. Mercy Health Services, 902 F. Supp. 968 (N.D. Iowa 1995), vacated as moot, 107 F.3d 632 (8th Cir. 1997)*. Succinct summaries of some of these cases can be found at: The DOJ Health Care Task Force Recent Enforcement Actions, http://www.usdoj.gov/atr/public/health_care/2044.htm; David Scheffman, Malcolm Coate, and Louis Silvia "20 Years of Merger Guidelines Enforcement at the FTC: An Economic Perspective," http://www.usdoj.gov /atr/hmerger/11255.htm and FTC Chairman Timothy Muris, "Everything Old Is New Again: Healthcare and Competition in the 21st Century. http://www.ftc.gov/speeches/muris/ murishealthcarespeech0211.pdf.

Summary of Closures and Openings by State

State	Closures			Openings	
	2000	2001	2002	2001	2002
AL		1	1		
AZ					1
CA	8	1	3		1
DC		1			
FL		2		1	
GA		2			
IA	1				
ID				1	1
IL	2	3	2		
IN		1		2	3
KS		1	2		
KY	1				
LA		1			
MI	3		2		
MN		2			
MO	3	2			
NC		1			1
NJ	3	3			
NM				1	1
NY	1	1	2		
OH	5	3		1	
OK	2	1	1	1	
OR	1				
PA	3	2	3		
SC		1			
SD				2	
TN	1				
TX	6	3	1	2	
UT		1			
VA	1	1			
WA				1	
WI	1	1		1	
WV	1				
WY	1				
Grand Total	**44**	**35**	**17**	**13**	**8**

Source: Modern Healthcare.

The result of these closures and consolidation activity has been a reduction in the overall number of beds. The following chart demonstrates this and also shows the distribution of beds among the for-profit, not-for-profit, and public sectors. While the first has remained somewhat stable, there has been a substantial reduction in beds in the second.

Number of Beds by Profit Status
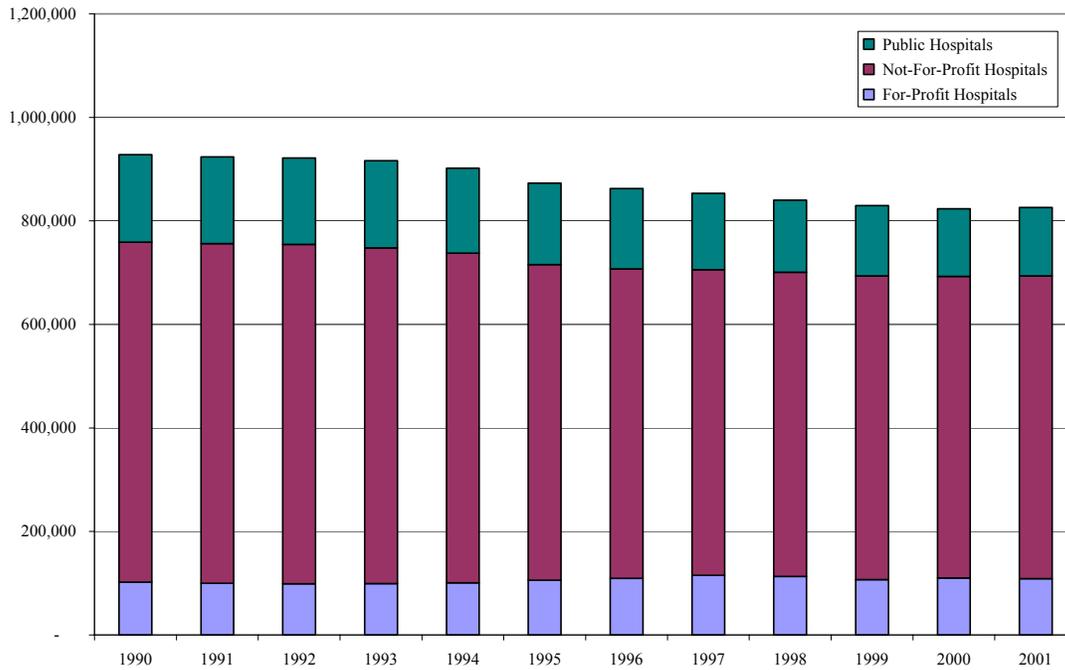
Source: Analysis of American Hospital Association Annual Survey data for community hospitals.

It is useful to put the Hay Study and the other BCBSA-commissioned studies in the context of the broad range of economic literature examining mergers and acquisitions in the hospital industry. Recent empirical studies examining the relationship between hospital market competition, prices and costs have found mixed results – some studies have found that greater competition leads to lower prices, while others have found the opposite.[31] While the Hay study claims that increases in total inpatient and outpatient payments are related to hospital consolidation, other economic studies have found that mergers and consolidations yield a variety of benefits, including efficient means for closure, reduction of service duplication, reduction of financially distressed firms and reductions in average prices and average costs.[32] Spang et al. (2001) find that merging

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[31] "Recent empirical studies examining the relationship between hospital market competition, prices, and costs, have found mixed results. Some studies found that the greater the competition, the lower are the prices (David Dranove and Richard Ludwick, "Competition and Pricing by Nonprofit Hospitals; a reassessment of Lynk's Analysis," Journal of Health Economics 18 (1999) 87-98; Dranove et al., 1993; Emmett B.Keeler, Glenn Melnick, and Jack Zwanziger, "The Changing Effects of Competition on Non-profit and For-profit Hospitals Pricing Behavior," Journal of Health Economics 18 (1999) 69-86; Melnick, Zwanziger, Bamezai, Pattison, "The effects of market structure and bargaining position on hospital prices," Journal of Health Economics 11 (1992) 217-233), whereas others found the opposite result (Connor et al., 1997, 1998; Lynk 1995)." (See Krishnan, 2001, Page 215)

[32] See, e.g., Pautler (2001), Gloria Bazzoli, Anthony LoSasso, Richard Arnould, and Madeleine Shalowitz, "Hospital Reorganization and Restructuring Achieved Through Merger," Health Care Manage Rev, 27(1) 7-20 (2002), and Heather Radach Spang, Gloria Bazzoli, and Richard

hospitals generally have lower growth in costs and prices per adjusted admission than non-merging hospitals (10.1 percentage points and 7.9 percentage points, respectively, for all hospitals).[33] Connor et al. found similar differences between merging hospitals and non-merging hospitals for cost and price growth (7.2% and 7.1% lower for merging hospitals, respectively). Both studies find that the presence and extent of cost growth and price growth savings for merging hospitals vary based on market and hospital characteristics.[34] Spang et al. conclude that horizontal mergers under certain

Arnould, "Hospital Mergers and Savings for Consumers: Exploring New Evidence," Health Affairs, Volume 20 Number 4 (2001). Bazzoli et al. (2002) examine hospital reorganization and restructuring activities for mergers that occurred between 1989 and 1996. The three top reasons for mergers were to achieve operating efficiencies, consolidate services, and strengthen financial position. Bazzoli et al. find that approximately 48% of rural hospital mergers and 39% of urban hospital mergers resulted in post-acquisition closures or service conversions. These authors also find that post-merger service duplication declines for three high-use categories (inpatient medical, emergency room and medical/surgical ICU). Pautler (2001) summarizes results of the several large, multi-hospital studies and indicates that the findings vary by study, with some (by Connor and Sinay finding both efficiencies and lower average costs and average prices for hospitals involved in mergers. One study (Sinay) finds that hospitals are more efficient after mergers. These beneficial effects are more likely if the merging hospitals are of equal size, the pre-merger duplication of services is high and the pre-merger occupancy rates are low. Pautler (2001) also summarizes a case study involving datasets of multiple hospitals as well as studies examining more discrete merger cases. The larger study (Bogue et al.) reviews several hospital characteristics post-merger, including the post-merger use of the assets. This study used surveys to analyze 60 hospital mergers. The study finds that 41% of the mergers surveys converted one of the facilities to an alternative inpatient use (non-acute care, such as psychiatric or long-term care), that 17% of the mergers surveyed closed one of the facilities and that 42% of the mergers surveyed continued to offer acute care at both facilities. These finding suggest that mergers may represent a means of profitably reconfiguring and consolidating assets, regardless of the overall strategy.

[33] Spang et al. (2001) consider data for 1,767 hospitals from 1989 to 1997. Of these hospitals, 204 were involved in mergers, 653 were non-merging rivals (non-merging hospitals in the same MSA as merging hospitals) and 910 were non-merging, non-rivals. This study only analyzes urban hospitals. Spang et al. look at changes in hospital costs and prices per adjusted admissions overall and in various subgroups based on market or hospital characteristics, for the hospitals in their study (a longitudinal study). Spang et al. compare their findings to the longitudinal study undertaken by Connor et al. (a study of 3,500 hospitals from 1986 to 1994 that compared merging hospitals to non-merging hospitals).

[34] Both the Spang et al. and Connor et al. studies find that the presence and extent of cost growth and price growth savings for merging hospitals vary based on market and hospital characteristics. The savings appear to be highest in competitive markets and when low-occupancy, non-teaching or nonprofit hospitals merge. Spang et al. note that while the findings between the two studies are consistent, there is a greater cost difference than price difference in their study. Spang et al. also consider the differences between merging hospitals and rival hospitals compared to the differences between merging hospitals and non-merging, non-rival hospitals (Connor et al. did not undertake these additional comparisons). They find that the differences in price and cost growth are smaller between merging hospitals and rival hospitals than between merging hospitals and non-merging hospitals. These differences in cost and price growth between merging and non-merging hospitals vary for the different subgroup comparisons (based on hospital and market characteristics). The results overall show that while the level of savings may vary, the results do

circumstances hold potential for beneficial cost and price effects. They also conclude that hospital mergers do not fall into a "one size fits all" policy.

While merger activity does not explain increased hospital expenditures, the basic statistics demonstrate that such expenditures are increasing. The following two sections examine the empirical evidence on the factors accounting for increases in the expenditures and the proportion of aggregate healthcare expenditures accounted for by expenditures on hospital services.

IV.   Alternative Explanations for Levels and Changes in Expenditures on Hospital Care: Prices, Costs, and Payments

In assessing hospital expenditures, it is important to note that expenditures[35] may increase due to: (1) increased input costs; (2) increased demand for and utilization of services; (3) increased prices; or (4) changes in the products or services that are purchased. Many of the studies regard price changes and payment changes as synonymous, even though these can be substantially different. In particular, it is important to consider whether changes in demand for services or changes in underlying input costs are the sources of increased total spending rather than changes in total payment being driven by price increases.[36]

Among the major contributors to increased expenditures on hospital services in 1999-2001 were input cost increases, particularly labor cost increases (including the effects of nursing shortages), pharmaceutical cost increases, technology costs, as well as increased demand for hospital services. The BCBSA studies themselves support the conclusion that over 80% of expenditure increases in the hospital sector are due to these and other competitively neutral factors.

First, as is shown in the following chart, total hospital expenses were increasing each year between 1990 and 2001, with an acceleration in the period 1999-2001 after relatively modest percentage changes in the mid-1990s. In 2001, about half of total expenses are attributable to labor costs and these are anticipated to continue to increase due to nursing

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not support a conclusion that mergers even in more concentrated markets systematically result in increased prices relative to costs.

[35] Throughout the text, the terms expenditures and payments are used synonymously.

[36] Health care costs, and increases in health care costs, are the focus of analyses and presentations by a variety of participants in the health care industry as well as by academic researchers. Much of the research focuses on documenting levels of overall costs as well as changes in costs in the various levels of the industry, including hospitals, pharmaceuticals, medical technology, physicians, outpatient providers (e.g., surgery centers), and insurance premiums. The level of costs at any given point in time are affected by a variety of factors, including inflation, changes in the product or services that are offered, changes in input costs (e.g., labor), and changes in either demand or supply conditions. Comparing costs across time is particularly difficult in health care due to ongoing changes in the products or services provided. In addition, where the "costs" of health care is measured by total payments made, costs may change because price has changed or because the quantity of service consumed has changed. For example, even if the per diem for a given inpatient service stays the same from period to period, payments may increase for the service if the average length of stay of patients for a service increases.

shortages. This is consistent with the BCBSA Summary, which identifies the other factors that contribute to the inpatient expenditure increases – the largest contribution is from hospital wages, with 20% of the expenditure increases attributed to such costs (and particularly to the effect of shortages in nursing staff).[37] This is consistent with the findings of the BCBSA report that examine costs in detail.[38]

Total Expenses and Labor Expenses (billion $)
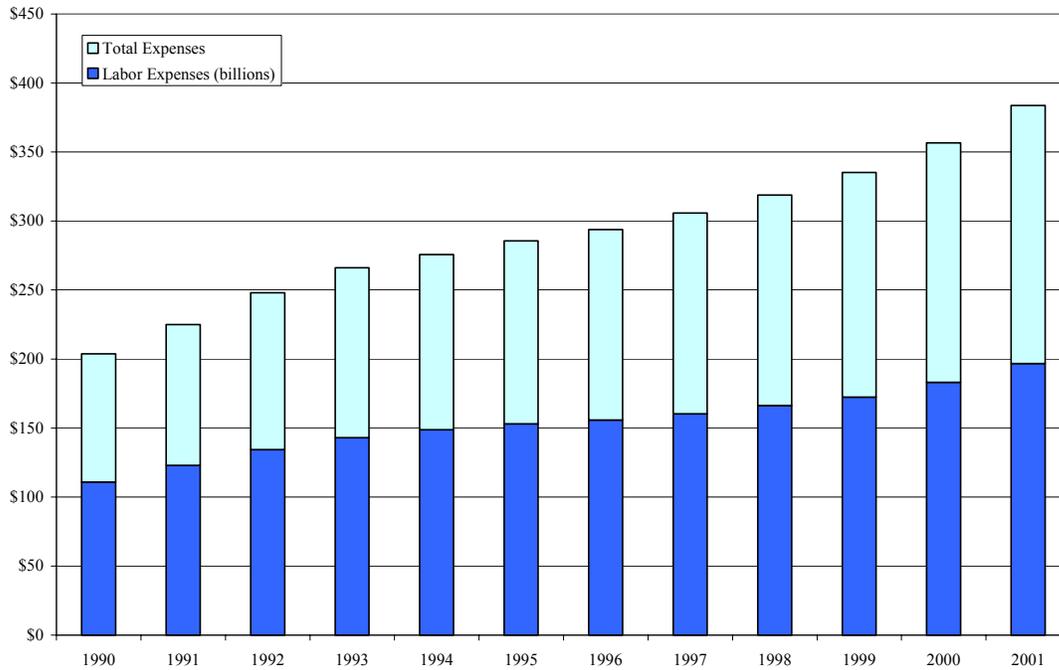
Source: Analysis of American Hospital Association Annual Survey data for community hospitals.

This trend in increased expenses was felt in every region of the country. This suggests that the underlying trend is a nationwide phenomenon of cost increases. While the precise cost levels may vary due to mix of hospitals as well as regional differences in costs, the pattern of cost increases was very similar throughout the country, as depicted in

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[37] http://bcbshealthissues.com/costpressconf/execsum (11/13/02), p. 2. This is also consistent with the Hay study which found that inpatient hospital expenditures per member of a large, national health insurance plan increased by 5.9% annually in 1998-2001. Prescription drug expenditures increased by 11.1% annually and outpatient expenditures increased by 15.0% annually over the same time period.

[38] The Kane et al study found that direct costs associated with nursing cost centers are roughly 44% of total inpatient care direct costs (with payroll accounting for 80% of these costs). Small increases in nursing payroll costs will have relatively large effects on inpatient hospital costs. Hospital payroll increased 3.7% in hospitals in 2000. If this rate is applied to inpatient nursing center payroll, it would account for approximately 47% of the 2.8% increase in inpatient cost in 2000.

the following graph. While the levels are different, the patterns are very similar across regions across time – expenses increased sharply between 1990 and 1993 before leveling off to some extent until greater increases in recent years. This pattern is also consistent with increase penetration of managed care in the mid-1990s.

Index (1990 = 100) of Expenses per Adjusted Admission by Region
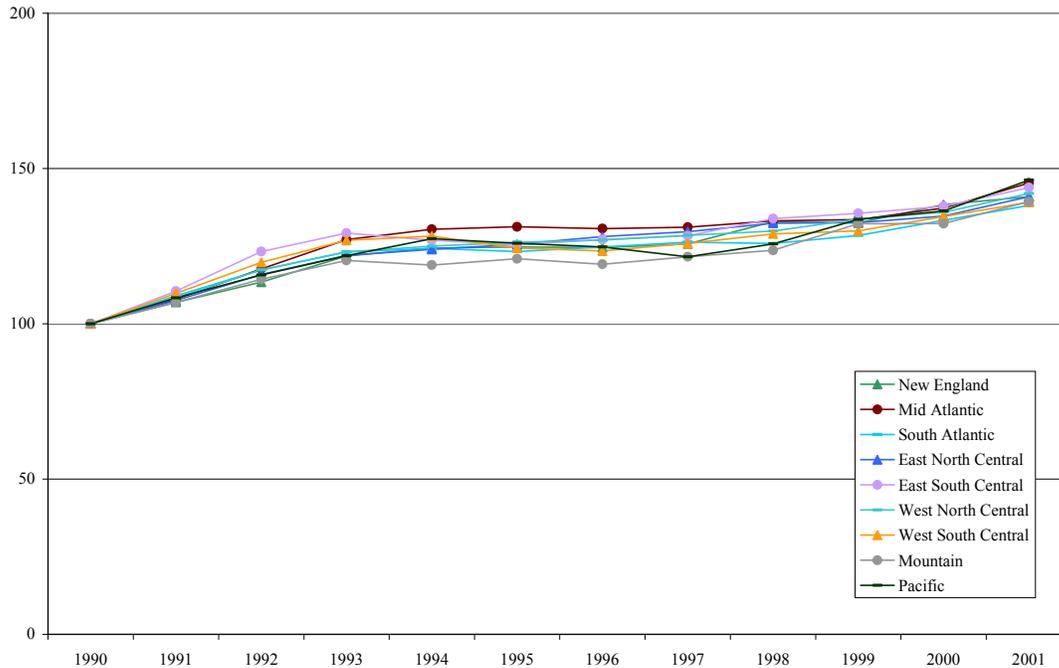
Source: Analysis of American Hospital Association Annual Survey data for community hospitals.

Demand for services also increased. One measure of increased demand, the number of admissions, is shown in the following table. The table shows that admissions had declined somewhat in the mid-1990s and then began increasing in the late 1990s.[39] The table also shows that Medicare and Medicaid admissions increased, both absolutely and as a percentage of total admissions. Finally, the table and the following chart show that outpatient visits have increased dramatically over the period.

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[39] There are a number of factors that are cited for increased admissions as well as increases in other measures of utilization. These include the shift of consumers from HMOs to PPOs, regulatory changes, product changes and demographic factors that may increase utilization of services. There are other factors, such as shifts to outpatient services, which may offset the effect of these changes.

Hospital Admissions Trends

Year	Total Admissions	Medicare Admissions	Medicare Admissions as % of Total	Medicaid Admissions	Medicaid Admissions as % of Total	Outpatient Visits
1990	31,181,046	10,692,845	34.3%	4,381,747	14.1%	300,514,516
1991	31,064,283	10,776,239	34.7%	4,767,762	15.3%	321,044,324
1992	31,033,557	11,126,925	35.9%	5,159,007	16.6%	347,847,202
1993	30,748,051	11,354,240	36.9%	5,360,368	17.4%	366,533,432
1994	30,718,136	11,596,940	37.8%	5,465,877	17.8%	382,780,358
1995	30,945,357	11,944,865	38.6%	5,366,258	17.3%	413,748,403
1996	31,098,959	12,116,070	39.0%	5,254,457	16.9%	439,863,107
1997	31,576,960	12,424,571	39.3%	4,989,342	15.8%	450,140,010
1998	31,811,673	12,390,196	38.9%	4,689,760	14.7%	474,193,468
1999	32,359,042	12,458,136	38.5%	4,686,123	14.5%	495,346,286
2000	33,089,467	13,567,553	41.0%	5,210,907	15.7%	521,404,976
2001	33,813,589	13,884,333	41.1%	5,462,091	16.2%	538,480,378

Source: Analysis of American Hospital Association Annual Survey data for community hospitals.

Medicare and Medicaid admissions currently account for close to 60% of total admissions at hospitals and an important source of revenue for most hospitals and disproportionately for many. Reimbursements for Medicare and Medicaid in recent years have reflected a lower proportion of total costs of care, which when coupled with the costs associated with uncompensated care, have resulted in increased pressure on hospital margins and financial stability.[40] In the aggregate, hospital revenues did not keep pace with the increase in expenses for hospitals.

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[40] In 2001, costs for Medicare, Medicaid and uncompensated care, collectively, exceeded their payments (including tax subsidies) by $23.3 billion. Regulatory requirements to serve patients and reimbursements from government payors has been studied as an important factor in hospital service provision, margin levels, and explanation for the necessity to cover a somewhat larger share of overall cost of services from private payors. In general, these studies show that if reimbursements for government services and uncompensated care do not keep pace with overall costs of care, then there is greater pressure to shift such costs to private payors.

Trends in Number of Outpatient Visits
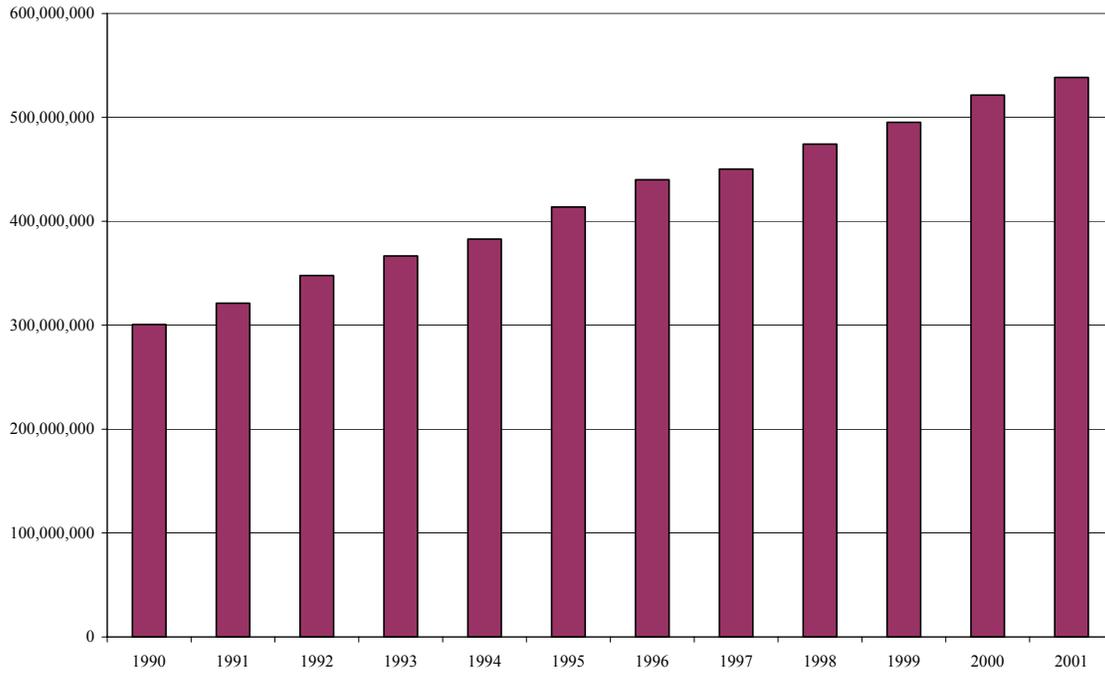
Source: Analysis of American Hospital Association Annual Survey data for community hospitals.

In the aggregate for hospitals, revenues did not keep pace with the increase in expenses for hospitals. Revenues on an adjusted admission basis or aggregate basis increased by less than costs -- the ratio of revenues to expenses declined from 1998 through 2001.

Total Revenue and Total Expense per Adjusted Admission Trends for All Hospitals
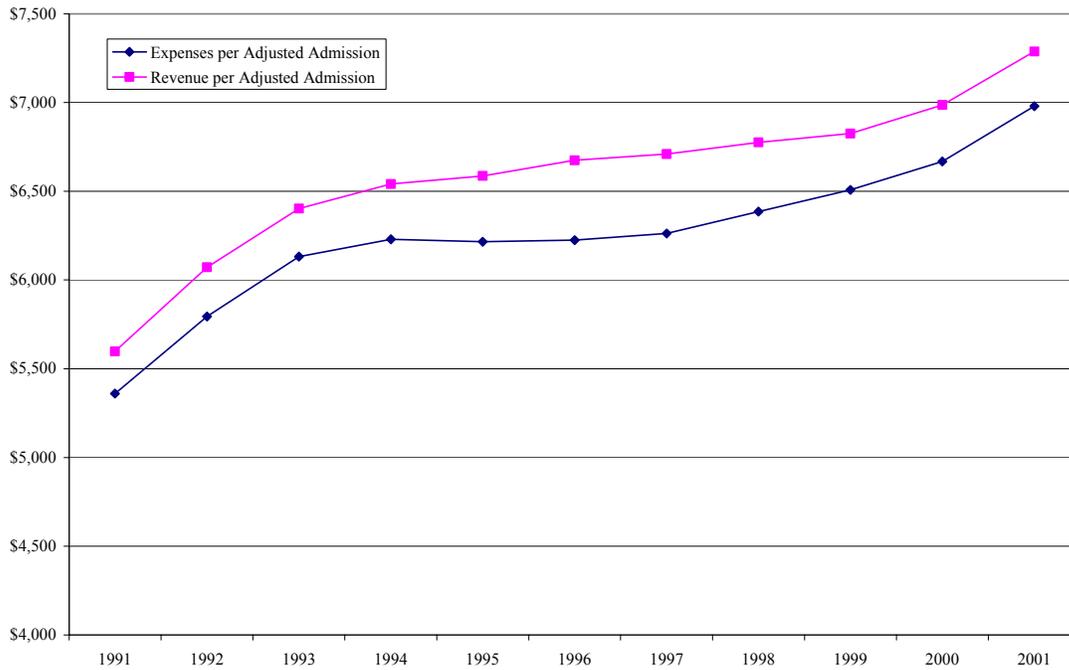

Source: Analysis of American Hospital Association Annual Survey data for community hospitals.

Other trends during the same period, such as increased utilization of services, increased demand for less restrictive PPOs in lieu of tightly controlled HMOs, and the relaxation of restrictions within HMO products, also help to explain hospital performance and spending trends.[41] As is shown in the charts below, enrollments in PPOs increased in the late 1990s, while enrollments in HMOs flattened.[42]

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[41] See, for example: D. Draper, et.al. "The Changing Face of Managed Care," Health Affairs, Jan/Feb 2002. According to a recent Modern Healthcare article, HMOs are developing "tiered" systems of hospitals, with narrower and broader networks, depending on the willingness of enrollees to pay higher co-pays: "Indeed, these new products represent an about-face from HMOs' recent push to lure customers by providing fewer restrictions, more services and broader networks. That strategy, health plans say, has led to higher costs-and higher premiums-because enrollees have lacked any financial incentive to choose lower-cost care options." L. Benko, "HMOs aren't shedding tiers," Modern Healthcare, (12/03/2001).

[42] This may understate the effect of changes in consumer preferences for broader networks and hence a reduction in the ability of managed care plans to commit sufficient volumes to obtain large discounts. Many HMOs moved from offering narrower and more exclusive networks to broader networks.

Health Plan Enrollment for Covered Workers, by Plan Type

1988	1998	2002

Legend:
- Indemnity
- HMO
- PPO
- Point of Service
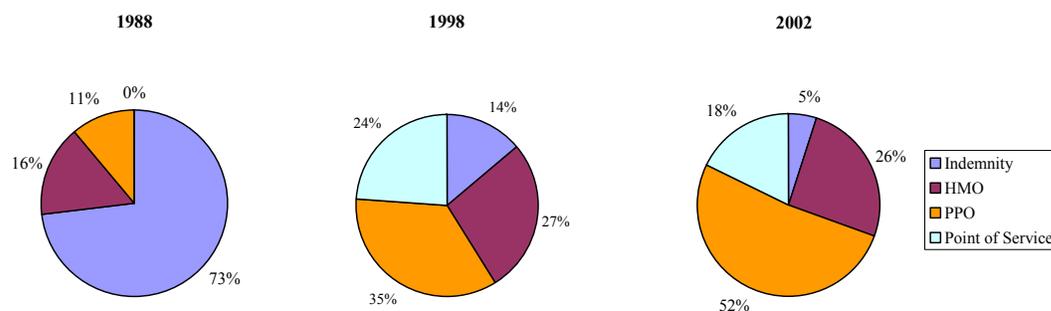
Source: The Kaiser Family Foundation and Health Research Educational Trust, Employer Health Benefits, 2002 - www.kff.org.

The BCBSA studies focused particularly on identifying recent trends in spending on hospital care (e.g., between 1998/1999 and 2001).

V. Spending on Hospital Care in the Context of Overall Healthcare Expenditures

More than 70% of the increase in healthcare expenditures in the period 1999-2001 was from sources other than hospital services; and some non-hospital sectors experienced larger percentage increases.

Hospital services are only one part of the overall healthcare sector in the US. The following table reports each sector's contribution to total healthcare costs in 2001.

National Health Expenditures, Aggregate and Per Capita
**Amounts, And Share of Gross Domestic Product**

Spending Category	2001	% of NHE
NHE (billions)	$1,424.5	
Health services and supplies	1372.6	96.4%
Personal health care	1236.4	86.8%
Hospital care	451.2	31.7%
Professional Services	462.4	32.5%
Physician and clinical services	313.6	22.0%
Other professional services	42.3	3.0%
Dental services	65.6	4.6%
Other personal health care	40.9	2.9%
Nursing home and home health	132.1	9.3%
Home health care	33.2	2.3%
Nursing home care	98.9	6.9%
Retail outlet sales of medical products	190.7	13.4%
Prescription drugs	140.6	9.9%
Durable medical equipment	18.4	1.3%
Other nondurable medical products	31.8	2.2%
Program (Government) administration and net cost of private health insurance	89.7	6.3%
Government public health activities	46.4	3.3%
Investment	52.0	3.7%
Research	32.8	2.3%
Construction	19.2	1.3%
Population (millions)	282.9	
NHE per capita	$5,035	
Personal health care deflator	115	
Real NHE, billions of dollars	$1,301.9	
GDP, billions of dollars	$10,082	
Chain-weighted GDP index	109.4	
Real GDP, billions of dollars	$9,215	
NHE as percent of GDP	14.1%	

Source: Centers for Medicare and Medicaid Services, Office of the Actuary, National Health Statistics Group; and U.S. Department of Commerce, Bureau of Economic Analysis and Bureau of the Census.

Total healthcare expenditures are projected to continue increasing over the next decade, with total expenditures in 2012 (17.7% of GDP) projected to be double the levels in 2001.[43]   While spending on hospital care is expected to increase, it will represent a declining portion of overall healthcare expenditures – projected to drop from 31.7% of expenditures in 2001 to 27.9% in 2012. In contrast, pharmaceutical costs are expected to increase from 9.9% of overall expenditures in 2001 to 14.5% in 2012. The following chart, which shows graphically the magnitude of expenditure increases between 1990 and 2012, highlights the increasing influence of medical products (including pharmaceuticals) on overall healthcare costs.

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[43] Centers for Medicare and Medicaid Services, Office of the Actuary, National Health Statistics Group

Total National Health Expenditures by Component (billions $)
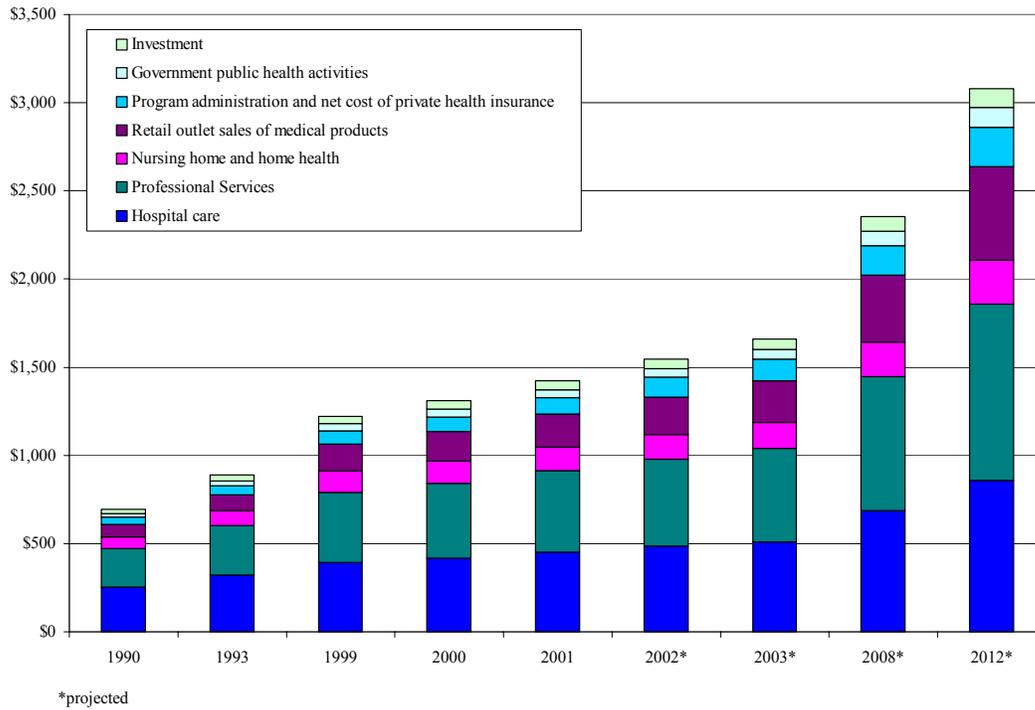
*projected

Source: Centers for Medicare and Medicaid Services, Office of the Actuary, National Health Statistics Group; and U.S. Department of Commerce, Bureau of Economic Analysis and Bureau of the Census.


The following table and pie charts put changes in spending on hospital care between 1999 and 2001 in the context of overall changes in healthcare spending. Expenditure levels are shown for each category of expenditures as well as the dollar and percentage differences between 1999 and 2001 levels.

National Health Expenditures, Aggregate and Per Capita Amounts, And Share of Gross Domestic Product

Spending Category	1999	2001	Percent change from 1999 to 2001	Dollar change from 1999 to 2001	Percent of Dollar change from 1999 to 2001
NHE (billions)	$1,219.7	$1,424.5	16.8%	$204.8	
Health services and supplies	1178.7	1372.6	16.5%	193.9	94.7%
Personal health care	1064.6	1236.4	16.1%	171.8	83.9%
Hospital care	393.7	451.2	14.6%	57.5	28.1%
Professional Services	396.9	462.4	16.5%	65.5	32.0%
Physician and clinical services	270.2	313.6	16.1%	43.4	21.2%
Other professional services	36.7	42.3	15.3%	5.6	2.7%
Dental services	56.4	65.6	16.3%	9.2	4.5%
Other personal health care	33.6	40.9	21.7%	7.3	3.6%
Nursing home and home health	121.9	132.1	8.4%	10.2	5.0%
Home health care	32.3	33.2	2.8%	0.9	0.4%
Nursing home care	89.6	98.9	10.4%	9.3	4.5%
Retail outlet sales of medical products	152.1	190.7	25.4%	38.6	18.8%
Prescription drugs	104.4	140.6	34.7%	36.2	17.7%
Durable medical equipment	17.3	18.4	6.4%	1.1	0.5%
Other nondurable medical products	30.4	31.8	4.6%	1.4	0.7%
Program (Government) administration and net cost of private health insurance	73.2	89.7	22.5%	16.5	8.1%
Government public health activities	40.9	46.4	13.4%	5.5	2.7%
Investment	41.0	52.0	26.8%	11.0	5.4%
Research	23.5	32.8	39.6%	9.3	4.5%
Construction	17.6	19.2	9.1%	1.6	0.8%
Population (millions)	277.7	282.9	1.9%	5.2	
NHE per capita	$4,392	$5,035	14.6%	$643	
Personal health care deflator	107.3	115	7.2%	7.7	
Real NHE, billions of dollars	$1,165.1	$1,301.9	11.7%	$136.8	
GDP, billions of dollars	$9,274	$10,082	8.7%	$808	
Chain-weighted GDP index	104.7	109.4	4.5%	4.7	
Real GDP, billions of dollars	$8,859	$9,215	4.0%	$356	
NHE as percent of GDP	13.2%	14.1%		1.0%	

Source: Centers for Medicare and Medicaid Services, Office of the Actuary, National Health Statistics Group; and U.S. Department of Commerce, Bureau of Economic Analysis and Bureau of the Census.

The data show that each of the major categories experienced large dollar increases between 1999 and 2001, with the largest percentage increases occurring in pharmaceuticals. Spending on hospital care increased at a lower percentage than most categories. During this period, hospital care increased by $57.5 billion from $393.7 billion to 451.2 billion and accounted for about 28% of the increase in healthcare costs over the period 1999-2001. Over 70% of the increase in increase healthcare expenditures was attributable to categories other than spending on hospital care. Prescription drugs increased from $104.4 billion in 1999 to $140.6 billion in 2001. Prescription drug costs accounted for about 18% of the increase in healthcare expenditure between 1999 and 2001, which was about double their share of overall expenditures.
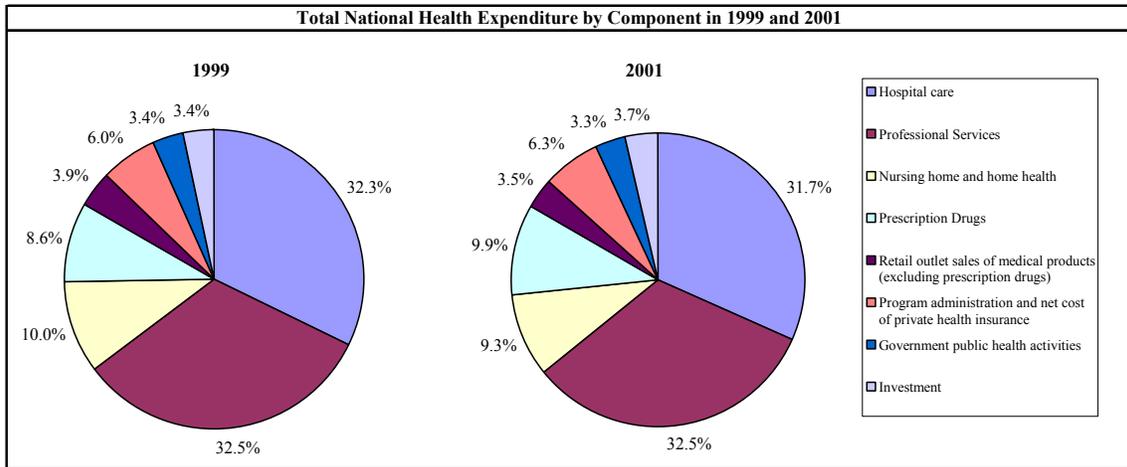
Total National Health Expenditure by Component in 1999 and 2001

Source: Centers for Medicare and Medicaid Services, Office of the Actuary, National Health Statistics Group; and U.S. Department of Commerce, Bureau of Economic Analysis and Bureau of the Census.

Thus, while hospital expenditure increases represent a substantial portion of the total increase, they did not account for the majority of the increases in total expenditures in the last few years. Almost 70% of the increase in spending was in other areas including professional services ($422.1 or 32.5%), nursing home and home healthcare ($124.7 or 9.6%) and retail sales of medical products including pharmaceuticals ($121.8 or 9.4%). Each of these categories experienced large dollar increases between 1999 and 2001, with the largest percentage increases occurring in pharmaceuticals.[44]

VI.   Conclusions

The BCBSA conclusions about the effects of hospital consolidations are not supported by their studies and in important respects are either contradicted by or inconsistent with one or more of them. The BCBSA studies recognize that over 80% of the increases in spending for inpatient and outpatient hospital services are attributable to causes other than hospital "consolidation," such as rising labor and pharmaceutical costs. The one study the BCBSA relies on to demonstrate that the remaining expenditure increases are attributable to "consolidation" provides no valid empirical analysis, lacks a conceptual antitrust foundation, employs a flawed econometric analysis, and finds counterintuitive results.

A review of recent merger trends and hospital financial performance further undercuts the BCBSA's conclusions about the effects of hospital "consolidation." Both the rate of mergers and aggregate total margins for hospitals declined over the period covered by the BCBSA studies, 1999-2001. These findings are inconsistent with the BCBSA's conclusion that hospital mergers have led to substantial increases in profits by means of

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[44] This is consistent with the findings of several BCBSA-commissioned studies. For example, the Hay study finds that inpatient hospital expenditures per member of a large, national health insurance plan increased by 5.9% annually in 1998-2001. Prescription drug expenditures increased by 11.1% annually and outpatient expenditures increased by 15.0% annually over the same time period.

anticompetitive use of market power. Instead, these findings are consistent with other findings in the BCBSA studies and other recent studies that indicate that increased spending on hospital services is driven primarily by increased expenses, a function of input costs (e.g., labor) and volume.

Evaluating trends in spending on hospital services is more complex than in many other sectors. Assessment of revenue increases, in particular, need to take into account increases due to changes in the quantity of service provided, increased demand for services – more patients, more services, more expensive services, higher intensity of care for sicker patients – and increases in prices of inputs such as labor or technology. The price for any particular service may change for a variety of reasons; the significant reason is the underlying pressures on the cost side of the hospital.

Recent years have been marked both by dramatic increases in input costs and increased pressure on most hospitals to cover the costs associated with plant maintenance and improvement. Trends in managed care, government reimbursement and uncompensated care have also been significant factors affecting hospitals. As a result, many hospitals are grappling with poor financial performance. These trends and related data provide useful background and valuable context for evaluating the hospital sector, including assessment of the rationale for and potential gains from mergers and consolidation. These trends do not, however, indicate either that past hospital merger activity and changes in hospital market structure due to consolidation have resulted in price increases or that greater antitrust enforcement activity is required in the hospital sector.

Appendix: Review of BCBSA Studies

Nancy M. Kane, "Analysis of Hospital Strategy and Financial Health," April 25, 2002

The Kane study examines hospital integration strategies and their implications for financial performance and cost and quality outcomes. The study considers three different hospital integration strategies: 1) local horizontal integration; 2) non-local horizontal integration and 3) local vertical integration. The dataset for this study includes 30 hospitals from five states (CA, FL, IL, MA and TX), with two hospitals for each integration strategy for each state. Financial, cost and quality information are estimated from 1999 and 2000 (if 2000 data were unavailable, then data were gathered for 1998 and 1999).[45] The Kane study's analyses consist of cross-tabulations and comparisons of means for the three different hospital integration strategies. The analyses also consider cross-tabulations and comparisons of means for the hospitals divided into financial performance categories (defined as financial health – distressed, red flag, sustainable) and HHI-based categories. Inpatient costs were not found to be significantly different among the three hospital strategy categories.

The Kane study gathers detailed information on price, costs and quality indicators for the 30 selected hospitals. While very detailed information is gathered on these 30 hospitals, there are potentially many issues associated with this small sample size. The Kane study does not discuss how the 30 particular hospitals were chosen and whether there are any potential biases associated with the selection. The Kane study does not offer any information on the characteristics of the particular hospitals in each category (i.e., size, urban or rural location, range of services offered, occupancy rate, university or teaching hospital, number of beds, when the selected hospitals underwent consolidation). Some of these characteristics may affect costs and payments. Second, the analyses frequently cannot answer whether the means are significantly different between categories because there are not enough observations per category. To compensate for this small sampling, the Kane study frequently combines categories to make comparisons (such as both horizontal compared to the one vertical or both local compared to the one non-local). However, there does not appear to be any theoretical basis for many of these combinations.

The hospitals included in both horizontal strategic categories also have some degree of vertical integration (as shown in the Kane Study's Table 1). These limitations indicate

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[45] Both AHA data and IRS Form 990 data were used to classify hospitals into system membership and determine whether the parent organization is local or non-local. IRS Form 990 data were used to gather the vertical integration information. The Kane study gives no indication as to how many hospitals in the AHA dataset were reviewed or how many Form 990s were reviewed, nor how hospitals in each category were selected. The study also used IRS Form 990 to estimate financial variables, including profitability, liquidity and solvency ratios. For cost, price, payment, length of stay and case mix adjustment measures, the study uses data from the 1999-2000 Medicare Cost Reports and the 2000 Uniform Hospital Discharge Data Abstracts (UHDDA). The UHDDA also provided data on quality indicators.

that any findings from the Kane study's study must be considered preliminary and tentative. In other words, they are more useful for suggesting further areas of study than for drawing strong conclusions about particular hospital categories.

This study does not consider the effects of integration from an antitrust perspective. It does not compare hospitals involved in an integration strategy to those that are not, nor does it compare integrated hospitals' pre-integration financial/quality variables to their post-integration financial/quality variables.

The BCBSA summary appears to cite the Kane study's finding that *non-local* horizontal integrated hospitals averaged 12% higher payments per discharge than the combined local horizontal and local vertical hospitals for the proposition that *consolidated* systems are able to get 12 percent higher payments per discharge than local independent hospitals. The findings, however, are reached by comparing means across different types of hospitals (based on their integration strategy) without controlling for other characteristics (e.g., payer mix, size, financial performance, investments and upgrading that are not captured in inpatient costs, technology, teaching or university hospital, etc.) that may impact prices, costs, quantity and quality. The study also does not control for whether there are different contracting strategies or types/sizes of payers across the different hospital categories. The Kane study does not consider whether there are characteristics of non-local systems that affect consumer demand, such as one-stop shopping benefits (for which the payer may be willing to be less aggressive on price), quality associated with a particular system or other "brand" preferences that may be associated with a particular system (that can be used by third-party payers to market their own products to insured patients).

The data do not include all the hospitals in any given system. This study cannot control for or consider whether there are any system-wide discounts or benefits that are not captured in an individual hospital's revenue and cost data. The financial performance findings of the study show that the horizontal non-local integration category has the highest proportion (40%) of distressed hospitals (the vertical integration category has 0% distressed and the local horizontal integration category has 30% distressed, see Table 3). The higher percent of distressed hospitals in the non-local horizontal category may be affecting its payments relative to the other two categories.

Interestingly, the study shows that a high proportion of hospitals in the study in "competitive" marketplaces did not experience sustainable financial performance.

Nancy M. Kane and Richard B. Siegrist, Jr., "Understanding Rising Hospital Inpatient Costs: Key Components of Cost and the Impact of Poor Quality," August 12, 2002

This study uses hospital discharge data and Medicare Cost reports data for hospitals in ten states to estimate the gross impact on total inpatient hospital cost of several factors (such as rising payroll costs, rising pharmaceutical costs, etc). This study does not address hospital consolidation or market structure. Cost, charges, quality, patient

demographics data were analyzed for 1880 general acute care hospitals in 10 states.[46] The study analyzes the data for each cost factor listed above (e.g., rising payroll costs, rising pharmaceutical costs, etc.). The study reports numbers, averages and/or percentages broken down by various categories for each cost factor (e.g., for the payroll cost factor, the study reports the percentage of costs attributable to each cost center; for quality indicators, the study compares teaching hospitals to community hospitals). The study also provides a brief literature review for each cost factor. The findings of the Kane et. al. study demonstrate the importance of input costs in the increase in spending on hospital services:

- Nursing cost center direct costs are roughly 44% of total inpatient care direct costs (with payroll accounting for 80% of these costs). Small increases in nursing payroll costs have relatively large effects on inpatient hospital costs. Hospital payroll increased 3.7% in hospitals in 2000. If this is applied to inpatient nursing center payroll, it would account for approximately 47% of the 2.8% increase in inpatient cost in 2000.

- Pharmacy cost center direct costs are 6.8% of inpatient costs.

- * The direct cost of poor outcomes for six common quality indicators accounts for 2.3% of total inpatient hospital expenditures. The authors indicate that the implementation of best practices could result in savings of $2.9 billion per year.

- * The direct cost burden of ambulatory care sensitive condition admissions (ACSC) is approximately 6.2% of inpatient hospital expenditures in 2000.

- * Approximately one-fifth of secondary care patients are treated in teaching hospitals at a direct cost that is 29% higher than in community hospitals (after adjusting for severity of illness). Secondary care represents 93% of the cases and about 78% of the total inpatient costs at teaching hospitals. The authors note that not all of these patients can be shifted to community hospitals. A small fraction of overall inpatient costs -- 1.7% of total inpatient costs -- are associated with the higher costs of having these patients at teaching hospitals.

- Population growth will increase total healthcare costs over the next five years by roughly 7% for males and 6% for females. Near-term impact of aging should not be a factor in the increase of inpatient costs as long as demand patterns by age cohort do not change significantly.

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[46] Data on direct and full cost information at the hospital and hospital cost center level (nursing, pharmacy, surgery, lab, etc.) are from the Medicare Cost Reports for 1999-2000. These data are for inpatient and outpatient combined. Data on charges, diagnosis and patient descriptors (age, sex) are from the 2000 Uniform Hospital Discharge Data Set (UHDDS). UHDDS charges are adjusted to reflect costs using the ratio of cost-center costs to charges. Adjustments also were made for severity of illness using the Refined DRG (RDRG) system from Yale as the basis for the adjustment.

- * The costs associated with non-best practices for cost containment (for those teaching and community hospitals not operating in the lowest cost quartile for each of these categories, respectively) are about 4% of total inpatient hospital expenditures in 2000.

- The cumulative cost burden of the * findings above is approximately 14% of total inpatient cost.

The study contemplates the theoretical notion that cost savings could be achieved if patients could be shifted to Centers of Excellence and from teaching to community hospitals, teaching hospitals were paid at the community hospital rate, and hospitals implement best practices for cost containment, among other conclusions. Even the authors, however, seemed to understand the difficulties associated with implementation of their proposals. There is limited discussion about the underlying factors that may explain the higher costs of teaching hospitals or the financial implications of reducing rates of reimbursement to the community hospital rate. Interestingly, the authors do not consider the ability of managed care plans to steer more patients to the community hospitals as a mechanism by which costs could be managed more effectively. The study does not consider whether market structure or hospital integration strategies impact inpatient costs.

Sharon Forrest, Mireille Goetghebeur, and Joel Hay, "Forces Influencing Inpatient Hospital Costs in the United States," October 16, 2002

This study reviews a broad range of literature to identify evidence on forces that may be driving increased hospital costs in the United States. Potential factors examined include the following: rising staff salaries, greater hospital negotiating leverage, higher demand for inpatient services, changes in population characteristics, broader health insurance coverage, increased number of uninsured, and more costly techniques and new procedures.

The authors rely on findings in the published literature. For each potential factor, the authors report findings from published data and if data permit, the authors identify or discuss trends pertaining to each potential factor. The authors also undertake a selected literature review for each potential factor. The authors state that although many of the contributors to the rise in inpatient costs overlap and are interrelated, the following are the major cost drivers identified in their review of the literature:

- Workforce shortage and costs
- New technology costs (including drugs) and underlying consumer demand
- Retreat from tightly managed care
- Legislation changes related to public and private healthcare spending
- Shifts in hospital business directions (e.g., mergers, increased negotiating strength with private plans)

The findings presented in this paper suggest that future trends in inpatient cost will depend on many factors. Consumer-driven health and evolution of new technology are the two factors that the authors indicate may have a major impact. The authors also indicate that there is a debate in the literature as to whether the recent increase in growth of hospital expenditures will be short lived or more permanent. The authors indicate that a multi-faceted public policy approach may be needed and present several interesting findings from published studies or data, including the following:

- As a percentage of total healthcare expenditures, hospital costs have declined from 42% in 1980 to 31.7% in 2000. (Table 3)

- The average annual growth in spending on hospital care from 1994-1999 was 3.5%. In 2000, it was 5.1%. (Table 3)

- Managed care faced consumer backlash and HMOs experienced declining enrollment in the 1990s. In the population of employed persons, 44% were enrolled in HMOs in 1996. By 2000, this had declined to 33%. During this same period, PPO enrollment increased from 28% to 44% and POS enrollment increased to 16%. (Page 29 and Table 3)

- Hospital payroll annual growth has increased from 2.6% in 1999 to 3.7% in 2000. The projection for 2001 is 7.6%.

- The annual percent change in employment-based insurance premiums grew from 0.8% in 1996 to 4.8% in 1999 to 11% in 2001. A study by PricewaterhouseCoopers in 2002 estimated a 13.7% increase for large employers between 2001 and 2002 – provider expenses were estimated to drive 18% of this growth. Of interest is that employment-based insurance premiums are growing much more rapidly than inpatient hospital expenditures, and that they grew even when inpatient hospital expenditures were experiencing negative growth (based on the estimates from other studies that show growth in per capita inpatient hospital expenditures ranging from about -2% in 1994 to about -5% in 1997 to about 2.8% in 2000, see Figure 1 of the Kane and Siegrist study).

- A recent report from the Center for Studying Health System Change estimates that the increase in spending on hospital care (both inpatient and outpatient) between 2000 (7.3%) and 2001 (8.7%) was due to increased use of services (62%) and higher prices for care (38%).

- One recent estimate indicates that new technology accounts for 22% of the increase in healthcare spending between 2001 and 2002. (Page 41)

- It is likely that recent legislative acts (the Benefits Improvement and Protection Act (BIPA) of 2000 and the Health Insurance Portability and Accountability Act (HIPAA) of 1996, for which compliance is effective April 14, 2003) have and will contribute to recent and future increases in hospital costs.

The Lewin Group, Inc., "Study of Healthcare Outpatient Cost Drivers, October 16, 2002

The Lewin study analyzes state-level outpatient costs data from three sources: 1) a large national, private commercial health insurer (not identified); 2) Hospital Cost Reporting Information System (HCRIS); and 3) Medicare Outpatient Standard Analytic File (SAF) in order to identify, analyze and discuss variables that drive healthcare costs in outpatient settings.[47] In addition to these data, the authors used a number of different data sources such as population statistics from U.S. Census Bureau, Centers for Disease Control and Prevention, SMG Marketing Group Data, U.S. Bureau of Labor Statistics, the American Medical Association, and BCBS information on health insurance mandates for the independent variables used in the regression analyses. The authors also conducted a literature review and undertook 31 interviews with a variety of industry experts, including health service researchers, healthcare economists, trade association representatives, hospital administrators and BCBS plan actuaries, medical directors and provider network management staff.

Two different approaches were used for the regression analyses based on the data source (a pooled cross-section model for the large national insurer data and state-level random effects models for the HCRIS and SAF data). All three models are estimated using state-level data. The pooled cross-section model for the large national insurer data (Model 1) is used in order to be consistent with the BCBSA-sponsored (Hay) study of cost drivers of inpatient care.[48]   For the random effects models for the HCRIS and SAF data (Model 2 and Model 3), the authors relied on information from their literature review, expert interviews and their own judgment to select the independent explanatory variables. Several versions of each model were estimated.

In all the models, variables from each of the nine cost driver categories were included. In cases where cost drivers from a single category were highly correlated, the authors

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[47] The large health insurer data included claims for over three million continuously-enrolled beneficiaries between May 1998 and April 2002. The HCRIS data only include operating costs for hospital outpatient departments. Data used in this study were from Fiscal years 1996 through 1999 (later years' data were very incomplete). To develop outpatient operating costs, the total operating expenses for each hospital were multiplied by the ratio of outpatient charges to total charges. The SAF file (1995 to 1999) contains all final outpatient claims for a five percent sample of Medicare beneficiaries. The file includes data for services provided at hospitals, hospital-based ambulatory surgery centers, skilled nursing facilities and clinics (i.e., dialysis, rehabilitation and community mental health centers). The file does not include data for services provided at freestanding ambulatory surgical centers. State-level estimates of real average allowed charges per beneficiary are constructed from these data

[48] This model uses a backward-selection stepwise regression approach. This approach begins by including all the independent variables in the regression model and at each step, the variable showing the smallest contribution to the model is deleted. The process continues until all non-significant variables are removed. Thus, this study forces three variables to enter the regression for comparability across all the models: total number of physicians per capita, specialists as a percentage of all physicians and average hospital wage.

eliminated the variable(s) that seemed to be less important based on the literature review process, expert interviews and the authors' judgment. Many of the proxy measures for technology and health status were eliminated if they were not significant or had unexpected signs. The regression analyses are conducted at the state-level. This limits the testing of health insurance products, health benefit design, provider structure and provider supply to broad changes at the state level, not to relevant antitrust markets.

The reported results are very sensitive to the methodology employed for applying the regression results. To show the relative importance of each cost driver category, the authors summed the individual regression coefficients within each cost category. This aggregation sums negative and positive coefficients. It may also combine variables that have cost-effective impacts on outpatient cost growth with those that have cost-ineffective impacts. The contribution of a factor is then estimated based on one of two methods: looking at actual changes in the explanatory factors or assuming each factor changes by the same percentage.

If actual changes in the factors are used, then provider market structure contributes relatively little to growth in outpatient expenditures (see Figure 17, page 35 – these factors changed little in recent years). For example, while provider market structure variables have high coefficients, they contributed very little (below 5 percent) to the actual growth in Medicare per-capita and hospital outpatient expenditures between 1995/1996 and 1999. Also, while the health status variables have low coefficients, their contribution is more significant when the actual changes in these variables are considered. Looking at actual changes in key factors over the study period results in demographic, general economic conditions and general price inflation accounting for more than half of the growth in outpatient expenditures.

The purpose of this study is to determine factors that drive outpatient costs and growth in outpatient costs. Yet, an increase in outpatient costs may be associated with a decrease in total healthcare spending. Thus, as the authors recognize, at least some level of outpatient cost growth may be cost-effective. However, the authors do not attempt to assess what amount of outpatient cost growth is likely to be cost-effective and what amount is likely to contribute to growth in total healthcare expenditures. The regression analyses conducted in this study are unable to separate or determine which factors may drive cost-effective outpatient cost growth, as opposed to those that do not.

Further, the major findings of this study report the relative importance of different cost driver *categories*. Some of the cost driver categories include factors that theoretically may drive cost-effective growth as well as factors that may, theoretically, drive cost-ineffective growth (or any given factor may have some aspects of both driving cost-effective and cost-ineffective growth). For example, the provider supply and organization category includes several factors for each of the three models (with some variation across the different models), such as hospital beds per thousand population, number of diagnostic imaging centers per thousand population, number of freestanding outpatient surgical centers per 1000 population, number of rehabilitation centers per 1000

population, percent of for-profit hospitals (bed-weighted), percent of hospitals in a medical system (bed-weighted) and the number of medical residents per 1000 population.

The authors seem uncertain as to how to measure the medical technology category at the state-level. They create proxy variables primarily using information about the treatment patterns and the availability of treatment services at hospitals within a state. Many of these proxy measures were eliminated from the final regressions presented in the study because they were not significant or had unexpected signs. Thus, this study finds that the technology and treatment category ranks only as the fifth most important cost driver (in relative importance), compared to one study cited that finds that technology accounts for one half to two-thirds of the annual increase in U.S. healthcare spending that is not attributable to inflation.

While the discussion focuses on how each cost category contributes to outpatient expenditure growth, the outpatient cost data used in the regression analyses are levels of per capita outpatient expenditures by state, not growth in outpatient costs.

Nine types of cost drivers were found to have affected the growth of outpatient costs: Provider Market Structure, Physician and Specialist Supply, General Price Inflation, and Demographic and General Economic Conditions; Treatment Patterns and Technology and Provider Operating Costs. Cost drivers that are less influential include Provider Payment, Health Status, and Health Insurance Benefit and Product Design. Findings from further analyses include, among others, the following:

- The introduction of new medical technologies raised outpatient costs.

- Areas relying more heavily on outpatient care (as a percent of total healthcare services) tend to have lower total healthcare expenditures. In some areas, outpatient services appear to have substituted for inpatient hospital care.

- The healthcare field is experiencing severe shortages in non-physician labor, especially nursing.

- On August 1, 2000, Medicare began reimbursing outpatient providers based on Ambulatory Payment Classifications (APCs). The effects of APCs were not measured in this study and are not yet known.

- Poor health status contributes to higher healthcare costs (e.g., obesity, high-blood pressure). Several health status indicators have deteriorated in recent years.

- Some level of outpatient cost growth may be cost-effective.

- The combined impacts of an increase in the number and proportion of specialty care physicians, the continued development of new clinical approaches for the control of chronic diseases and an aging population imply that the current increases in healthcare costs could continue unabated.

The authors of the Lewin study address a number of issues that could potentially affect the interpretation or the reliability of the study's results. The authors recognize that both provider payment strategies and hospital contracting have changed dramatically over the 1990s. Many hospitals shifted from capitation to shared risk. Some payers have implemented case rates that bundle inpatient and outpatient services. The authors discuss some of the issues related to the regression analysis, including limitations of the stepwise regression approach, which may produce a biased R-squared and overstated significance levels and the fact that there may be correlations between the independent variables. The authors discuss that the physician supply, in particular the supply of specialists, may be correlated to the technology proxy variables. Other independent variables may be correlated. The authors do not discuss whether they considered the correlation between other variables, such as the hospital system variable with the HMO penetration variable in Model 2. Nor do they discuss whether a coefficient on any given independent variable may be capturing the impact from omitted variables.