BEFORE THE FEDERAL TRADE COMMISSION

TESTIMONY
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President and Chief Executive Officer
of Columbia/HCA Healthcare Corporation

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Chairman Pitofsky, Commissioners:

Thank you for the opportunity to participate in these important hearings. I compliment all of you on your willingness to devote time and thought to the related questions (1) of how competition really works in our day and age in particular industries, and (2) of when government intervention should be used to protect it.

Your hearings, I hope, will be productive in giving you, as government regulators, a fuller understanding of the many different competitive forces at work today in the varied product and service markets in this country. And I hope that the hearings will give you (and the Justice Department's Antitrust Division) a better understanding of the limits and faults of the tools you use to evaluate when to intervene and overrule the decisions of business firms.

Columbia/HCA Healthcare Corporation is a relatively new player in the healthcare industry. Columbia was founded in 1987 and now has annual revenues exceeding $17 billion. We operate more than 330 hospitals, 100 surgery centers, and a number of other healthcare businesses in 36 states and in two foreign countries. Of the approximately 5,300 hospitals in the United States, about 4,600 (86 percent) are tax-exempt facilities. The remaining approximately 700 hospitals are taxpaying, generally owned by publicly-held companies. Columbia operates approximately six percent of the hospitals in the United States. From a national perspective, there are a plethora of players who already compete in the market for hospital facilities, and who are capable of entry into any community which is under-served (if such exists) in a very short period. In short, the United States is an intensely competitive hospital facilities market.

Columbia represents a new kind of competitive force in this highly competitive industry. It should be obvious from our statements and, more importantly, the innovative competitive activities on which we have staked our future, that Columbia believes strongly in the value of free markets and the competitive process. We believe that our mission, as a provider of healthcare services, is to compete aggressively to provide high quality healthcare services at lower costs. We have an extremely strong track record in fulfilling this mission and we will continue to bring new and innovative technologies to the healthcare marketplace.

Let me also emphasize Columbia's deep belief in and respect for the antitrust laws. Columbia does not want to deal with monopolies or cartels in connection with any of its purchases. And we recognize the importance of well-reasoned antitrust enforcement in protecting competition and consumers.

We believe we have filed more Hart-Scott-Rodino pre-merger notifications than any other single company. You have investigated Columbia up, down, and sideways. You and the Justice Department have together required us to supply literally over two thousand boxes of documents, and pay for the time and expense of countless lawyers and economists, in order to justify our competitive activities. You have forced us to divest ten hospitals and one surgery center and undo one joint venture. You have used a great part of your staff resources investigating us and the healthcare industry. Thus, we are particularly pleased that you have invited us to testify in your present hearings. In the spirit in which I know these hearings have been convened, I want to give you a candid appraisal of how we see your work, and how we believe it could be improved upon.

It will come as no surprise to you that I believe that the totality of your efforts, directed at Columbia, have in the end resulted in actions that were totally irrelevant to protecting competition in real world healthcare markets. The divestitures have not, in my opinion, improved competition in the hospital and healthcare industry or in any way benefited the affected communities. On the contrary, my belief is that your actions in many cases have entrenched dominant hospitals and inhibited consolidations which would have reduced costs and improved

care.[1] One of my theses to you in this testimony is that the nature of the hospital industry, as a supplier of healthcare facilities for the medical profession to use in the interests of patients (the ultimate consumers), is such that what you call illegal coordinated interaction is relatively improbable over the long term. In short, the market mechanism itself will in fairly short order eliminate conduct that does not benefit consumers.

Thus, while Columbia applauds your efforts (and those of the Antitrust Division) to stamp out collusive behavior that is a per se violation of the Sherman Act, and to uncover covert conduct that harms the free market, it sincerely doubts whether your efforts in overt merger and acquisition transactions will ever really contribute to the competitive process in the real world so long as you utilize the current inflexible concentration model. That model posits six (6) players, with any reduction in that number bringing investigation and, sometimes, government intervention. The hospital industry in this country simply will not support six (6) hospital players in every community and produce the lower healthcare costs the public and the Congress are demanding. Indeed, most communities can support three, at best, with many requiring only two competitive systems. Some of your actions (and those of the Antitrust Division) are beginning to show appreciation of the fact that the hospital industry does not require a plethora of players to be competitive. Additionally, Columbia believes that the techniques you use to investigate hospital transactions can now, with the knowledge you have already gained, be streamlined extensively to reduce costs to us and costs to you in enforcement resources.

I. The Healthcare Landscape

Let me sketch briefly the healthcare landscape as I see it in 1995, emphasizing several key points

Radical change is overhauling the whole of healthcare delivery in the United States.

[1] I say this not to complain about you as Commissioners or about your able and dedicated staffs, many of whom we have grown to know and respect. Rather, it is candidly to set the stage for our suggestions to you about future enforcement actions in the healthcare industry.

The growth of managed care, with numerous different forms, is a major fact of life for all providers: hospitals, surgical centers, nursing homes, physicians, nurses, pharmaceutical manufacturers, durable equipment suppliers, medical schools and teaching hospitals, and research centers. Illustrative is the fact, reported in The Washington Post of October 25, 1995, that a KPMG Peat Marwick study shows that the percentage of insured workers in managed care programs has risen from 29% in 1988 to 70% in 1995, with a dramatic reduction in the rate of increase of companies' spending on healthcare. Technological advancements, including the major new uses of computers and telecommunications networks, are drastically changing the landscape, affecting such areas as the length of stay of patients, the place where various surgical and diagnostic procedures are done, the very nature of diagnosis and treatment, and the use of "wellness" concepts. As patients and third-party payors try to cut their healthcare costs, imaginative new concepts of cooperation among providers (with attendant sharing of risks and rewards) are being introduced every year.

Consolidation of facilities is continuing at a swift pace. This consolidation is a good thing, because it not only allows economies of scale to be achieved, but also lets the market correct for the governmental interventions of the past which created a vast overcapacity of hospital beds in this country. Today, 36 percent of the nation's hospital beds are empty. Occupancy rates, on average, are at their lowest rates in decades. In a number of states, 40 percent or more of the hospital beds are empty. The costs and overhead of maintaining this over-capacity are high and add to the health care costs to consumers. Whether the antitrust agencies like the reduction in capacity that is occurring in this country, it is going to happen. It can be achieved most efficiently through private transactions rather than through awkward government mandates.

New healthcare products, resulting from new networking arrangements are being devised by the providers. Columbia, for example, is not only offering various hospital and related service plans to providers, but is also involved in negotiating joint ventures with HMO-type organizations that rest on the risk-sharing involved in capitated rates. Columbia is similarly involved with some of the country's leading teaching institutions to provide, as part of its product mix, access to those centers of excellence. Antitrust enforcement should encourage this, not

discourage innovation by burdening those who try with costly and lengthy investigations.

Provision of facilities---which is the essence of the hospital business---is evolving. Distinctions between hospital facilities, surgery centers, nursing care facilities, is blurring, as more and more procedures are being performed in non-traditional locations. Often, it makes economic sense for one entity to own and operate several different types of facilities, in order to maximize and coordinate their use, and gain acceptance by the public and the medical profession of lower-cost ways to operate.

Tax-exempt institutions are turning to tax-paying, for-profit institutions for help in bringing market discipline to their affairs. Columbia, for example, now has joint ventures with several tax-exempt, non-profit institutions. Examples are Cedars Medical Center, Winter Park Memorial Hospital, and Southwest Texas Methodist Hospital. If antitrust enforcement is not to impede genuine progress, then it must accommodate imaginative arrangements between tax-exempt and tax-paying corporations, recognizing the Internal Revenue Code as a fact of business life. Put another way, the economic integration sufficient to pass antitrust muster should be defined in ways that accommodate to the realities of the tax code so that disparate institutions can work together to lower healthcare costs.

The time periods within which provider arrangements are fixed is becoming shorter. Traditionally, providers of hospital facilities looked to the long-term to compete. Today, the contractual arrangements, the input purchases and the third-party payor arrangements are generally for shorter periods. Put another way, the points of competition along a time-line are more numerous. Companies that do not or cannot act and react swiftly to changing needs will be the losers. This, in turn, should caution antitrust enforcers about investigations and approval periods that constrain hospital company actions while they are pending. It also means that the market itself is more likely to correct any temporary non-competitive situations, without the necessity of any government intervention.

Quality and reputation continue to be important characteristics. While there is wisely a renewed emphasis on keeping the cost of healthcare to the consumer under control (i.e. to keep prices for our services down), you should never underestimate the reality that quality and reputation for service is the key to successful provision of healthcare, including the provision of healthcare facilities. Thus, it is imperative in dealing with the hospital and healthcare industry to keep your enforcement perspective on quality and reputation, as well as on price, in judging the competitive impact of different suppliers.

In the complex, evolving, and dynamic industry that I've just described, rigid application of enforcement rules that were designed to deal with more stable, static markets carries a high risk of doing more harm than good. The effect of government intervention in an environment of rapid change and complexity is highly uncertain. In my view, antitrust enforcement officials should approach each potential market intervention with the essence of the Hippocratic Oath in mind: Above all, do no harm.

II. Limitations of Your Economic Models and Analytical Tools

The costs and potential harm of government interventions -- including the unintended consequences -- suggest that antitrust enforcement policies must be based on sound economic theory and supported by empirical evidence. Moreover, the application of those policies in any particular industry must reflect the true nature of competition in that industry. Antitrust enforcement officials must attempt to identify the forces that actually determine the competitive conduct and performance of firms subject to their antitrust review.

Concentration Presumptions Are Unrealistic and Unsupported

Unfortunately, in my view, the federal Horizontal Merger Guidelines embody a model of competition that does not reflect the realities of the health care industry. In particular, the Guidelines establish a presumption that a merger resulting in a relatively small increase in market concentration will increase the probability that competitors in the identified market will tacitly or

explicitly collude. Use of the Guidelines' concentration-based presumption in evaluating hospital mergers fundamentally misconceives the forces that drive hospital competition and hospital consolidation.

Given this disconnect between the Guidelines methodology and hospital market reality, we asked the distinguished economists of Economists Inc. (many of whom have served in the Federal Trade Commission and the Antitrust Division) to review the theoretical and empirical foundations for the concentration presumption. More specifically, we sought a better understanding of (1) the reasons for the specific quantitative concentration standards incorporated in the Guidelines and (2) the relevance of those standards to predicting the competitive effects of hospital mergers.

Economists Inc. has described its analysis and conclusions in Appendix B to my written testimony. In summary, these distinguished economists conclude that the relevant economic literature does not provide a basis for a presumption of anticompetitive effects based on concentration levels.

> First, the theoretical models on which the Guidelines' analysis of differentiated products appears to be based do not provide a clear relationship between concentration and market performance.
>
> Second, there is no theoretical or empirical literature that suggests a critical concentration level -- for example, an HHI of 1800 -- above which coordination becomes likely. For example, a fairly typical community with two large hospitals with market shares of say 40% and 35% and two smaller hospitals with shares of 15% and 10% produces an HHI of 3,150. These findings are not at all surprising for those of us who live and breath competition among hospitals. For us, it is hard to imagine that anyone would suggest, in the current competitive environment, that an acquisition reducing the number of hospital systems in a community from four to three, or even from three to two, could have an adverse effect on health care

consumers. And, indeed, there is absolutely no reliable empirical evidence that it would. On the contrary, a major FTC staff report could not find any relationship between concentration and price, and other empirical studies found evidence consistent with an efficiency rationale for hospital consolidation. Yet, the Guidelines would raise a presumption of a competitive problem -- and would subject us to yet another costly investigation (or worse) -- if we proposed to integrate one of six equal sized hospitals into our system locally.

Third, and perhaps most important, the relevant economic models suggest that concentration is less relevant to predicting anticompetitive effects than factors such as the ease and speed of detecting defections from coordination and the speed and severity of punishment for such defections. When these non-concentration factors are carefully evaluated in hospital markets, it becomes clear that successful coordination is nearly impossible. Hospitals compete along literally hundreds of dimensions, they provide literally hundreds of discrete services, and their customers are represented by powerful bargaining organizations. Moreover, no two hospitals or hospital systems are alike -- they have widely varying organizational forms, missions, and cost structures, among other things. The more sophisticated economic models of competitive behavior confirm what hospital operators already understand: illegal coordination under these conditions is not a reasonable possibility.

Time Periods On Entry Are Unrealistic and Unsupported

The Horizontal Merger Guidelines adopt, quite arbitrarily and with no citation of supporting empirical or theoretical evidence, a two-year time period for entry as a remedy for any possibility of increased risk of collusive behavior or illegal coordinated interaction. To suggest that one arbitrary time period should apply across all industries and markets in the United States

is itself a problematic assertion, when what you are really saying is that, if entry cannot be proved predictably to occur within 24 months, government intervention will occur, largely without regard to the actual pro-competitive efficiency benefits that the consolidation would have been producing for that period and thereafter.

In the case of the hospital industry, where practically any hospital can be built and put into operation in two years (and many in 18 months), it is in my opinion a terrible waste of government resources and an unnecessary government intrusion into the market-based functioning of the hospital industry for the government to intervene because, in some cases, it may take 25 months or longer to get a new hospital in operation.

In short, your entry guidelines do not work well for the hospital industry, because its entry parameter is at the margin of your arbitrary Guideline period.

The 5% Test Is Purely Arbitrary

With the unfortunate focus on concentration and HHI numbers, the antitrust agencies evaluation of hospital consolidations requires market definition which in turn causes your staffs to rely on the "5% Test" as a means of defining a market. Various antitrust officials over the years have noted, and admitted, that the 5% test is purely arbitrary; Assistant Attorney General William Baxter could have chosen 6% or 10% or 20% when the current generation of Horizontal Merger Guidelines were announced in 1982.

I wish you could hear the stories we hear from healthcare professionals in the field who have been called by your staffs and asked simply whether a 5% increase in price would cause them to shift patients to another location; they are puzzled, confused, and irritated by what they consider a ridiculous question. Yet, so long as your staffs are not given better directions, that is the type of question that will be asked. The question never gives the interviewee the other alternatives, nor does the question suggest time frames, quality considerations, or other extremely important factors in actual decisions by third-party payors and others as to where they will seek hospital facilities. A better recognition of the arbitrariness of the 5% test and the limits on simplistic questioning about it would materially improve the analysis of how competition works

in real hospital markets.

Some Suggestions For Change In Your Policies

What does this mean for antitrust policy regarding hospital mergers? Given the tenuous relationship between concentration and competitive performance in the hospital industry, and in light of the impossibility of successful coordination in hospital markets, Columbia strongly suggests that the Commission (and the Antitrust Division) revise its hospital merger analysis in at least the following ways:

- eliminate the use of the concentration presumption in evaluating hospital mergers; in fact, you should presume that three, or even two, hospital systems in a community will provide effective competition;

- before you intervene, require an affirmative showing that anticompetitive effects are likely as a result of the particular transaction at issue; you must be able to demonstrate how coordination among hospitals would work in a particular geographic market (which we strongly suspect you can seldom show);

- recognize more formally the substantial efficiencies achieved through hospital integration under current cost and capacity conditions in the United States; given the overwhelming evidence that hospital consolidation has achieved efficiencies and benefitted consumers -- evidence that is probably clearer and more available than in any other industry -- it is simply unconscionable to continue to evaluate efficiencies justifications for hospital mergers with the degree of skepticism you currently accord them.

III. Reform of the Investigative Process

I want to say a few words about the need for procedural flexibility in your review of hospital mergers. In my view, hospital merger review imposes enormous, and largely unnecessary, discovery burdens on merging hospitals. Enforcement agency analysis of hospital mergers is not in its infancy. It is a mature enterprise, dating back well over a decade. The documents and information that are really necessary are, or should be, well-established. The Commission's experience with hospital mergers and the large hospital systems should have removed some of the uncertainty upon which broad discovery could possibly be justified. In fact, the lawyers and economists that we employ and those that you employ seem largely to agree on which questions are important and on what forms of evidence will likely provide the answers. Nevertheless, Columbia faces essentially the same excessive breadth and depth of HSR Second Request (and CID) discovery on current acquisitions that hospitals faced a decade ago. We continue too receive the same standard Second Request as if the issues have not been joined, and as if little has been learned, from previous hospital merger investigations. Greater recognition of this long history of enforcement would likely reduce unnecessary investigational burdens.

Of course, some problems with the investigational process arise from problems with the substantive analysis. A significant measure of the unnecessary burdens of hospital merger enforcement can probably be traced to the Guidelines' market concentration presumption and the agencies apparent unwillingness to recognize the hospital entry is easy (that it would occur within two years or sooner if the buyers believed supra-competitive prices were collusively being established). It appears to us that markets are often defined in order to find concentration figures high enough to establish the concentration presumption and that investigation efforts center on finding someone willing to say that entry would take a few months longer than two years. With respect to the talented people on your staffs who are doing this, I believe that the efforts are misguided if the real issue presented to them by you were simply phrased in terms of whether government intervention is really required to remedy a market defect. If, instead, hospital merger analysis held a greater appreciation for the qualitative factors that make coordination implausible in this industry, many fewer investigations would be initiated and investigations could be

streamlined. Finally, a greater and earlier focus on the business purposes of a hospital transaction would also likely shed sufficient light on its potential effects that burdens could also be reduced.

There are two other procedural contexts (other than HSR) in which burdens on hospital systems could be greatly reduced without adversely affecting the Commission's ability to do its work. I am referring to the procedures you have in place for consideration of applications for Commission approval of divestitures, and your current view that prior notification provisions should be contained in consent orders. (I compliment your recent action is eliminating prior approval provisions.) To suggest, as your Compliance Division routinely suggests to us, that it will take a minimum of three months (90 days) to process a deal to divest a hospital in accordance with a Consent Order seems to us an admission that procedures need to be improved or more resources devoted to the task. If you can review major mergers under Hart-Scott-Rodino in 30 days, it ought not to take three times that amount of time to review a deal to divest a hospital under a Consent Order. As to prior notice requirements, Columbia will shortly be filing a Petition in which we hope to persuade you that prior notice should not routinely be required in hospital Consent Orders.

Having offered these suggestions, let me emphasize that they are really suggestions directed to the Commission itself. Your staffs have been notable in their willingness to work with us to minimize burdens, within the limiting parameters of what they consider your directives. My suggestions, therefore, should not in any way be considered as a adverse reflection on anyone on your staffs. But in the spirit of these hearings, I did want to note that some further changes need to be made to reduce the cost and burden of antitrust investigations.

IV. Innovation: the Real Point of Competition That Should Be Encouraged

In the health care industry, as in many industries today, the principal mechanism for improving consumer welfare is dynamic innovation. The breadth and speed of innovation in health care is striking. Innovation in diagnostic and treatment technology continues at a rapid pace. Broad-based advancements in information systems, including the major new forms and uses

of computers and telecommunications networks, is particularly important to the health care industry. Finally, providers and third party payors continue to introduce imaginative new concepts of cooperation to reduce health care costs. I described earlier some of Columbia's groundbreaking activities in this regard.

Antitrust enforcement officials should take extreme care that they do not deter any of these forms of welfare-enhancing innovation in the name of protecting competition among hospital facilities. It should be obvious that the continuing consolidation of facilities has not reduced the breadth or speed of any form of innovation. Indeed, consolidation improved the conditions for innovation by permitting firms to achieve economies of scale and scope, and by rationalizing the elimination of costly excess capacity. Antitrust enforcement should encourage this, not discourage innovation by burdening those who try with costly and lengthy investigations.

The antitrust agencies' Health Care Policy Statements were a useful attempt to provide guidance so that many clearly efficient forms of competitive activity were not deterred. Nevertheless, these Statements still have built into them a model of competition that presumes adverse effects when the number of competitors falls below six or according to some other fairly arbitrary concentration figure. The Commission must recognize that the factors that drive competitive performance in the health care industry -- most importantly, those factors that drive the multi-faceted innovation in this industry -- cannot be captured by models of static rivalry.

Moreover, to the extent that antitrust enforcers believe that models of static rivalry are in any way descriptive of the real world, they must give greater weight to the reality of actual and potential entry into hospital facilities markets. There are literally thousands of firms capable of building hospitals, and hospital entry continues. Thus, the threat of entry should be considered a strong disciplining force on any potential anticompetitive conduct by incumbent firms.

Conclusion

Your work in enforcing the federal antitrust laws--which the Supreme Court has called the Magna Carta of our economic liberties--is vital. Columbia supports vigorous enforcement. Columbia particularly supports your efforts in these hearings to come to grips with the realities of competition in the varied, and highly different, industry and service markets, and find better ways of determining when government intervention is really required to ensure competitive markets.

We have suggested that improvements are needed in your understanding of the hospital industry and changes are needed in your ways of thinking and acting on government intervention in hospital situations. I sincerely hope my testimony, and the appendices to it, will aid you in your endeavors.

Thank you.

Appendix B

Survey of Economic Studies

Barry C. Harris and David D. Smith[1]

Economists Incorporated

I. Introduction and Summary of Conclusions

Health care markets in general, and hospital markets in particular, continue to experience profound changes from the traditional ways in which services were provided. In the past, hospitals principally provided inpatient services and were reimbursed through cost-based indemnity insurance. Now, they are moving quickly away from that model. The American Hospital Association reports that the number of inpatient days at community hospitals fell from 278 million to 216 million between 1982 and 1993, while outpatient visits increased from 248 million to 367 million. More than half of all surgeries currently are performed on an outpatient basis, and many of these occur in non-hospital facilities. In addition, patients are increasingly likely to be covered by a managed care plan (principally an HMO or PPO) or even an employer that contracts directly with the hospital for services. This trend is reflected in the growth of HMO enrollment, from 10.8 million to 49.0 million between 1982 and 1993.

As a result of these and other changes, many hospitals face a difficult financial future with reduced patients and reduced revenues. These difficulties are reflected in the

[1] David Argue, Paul Godek, and Kent Mikkelsen of Economists Incorporated helped review the literature discussed in this survey.

more than 400 hospitals that have closed over the past five years. In an attempt to obtain much needed cost savings, many other hospitals have entered into merger agreements.[2] This promise of potentially significant cost savings means that it is particularly important that antitrust merger policy be cognizant of the particular characteristics of hospitals.

As with mergers in other industries the Department of Justice and the Federal Trade Commission apply the analysis described in the 1992 Horizontal Merger Guidelines. The Guidelines analysis provides the flexibility that, if followed, requires consideration of the many unique characteristics of individual markets, including hospital markets. As the Guidelines acknowledge, these characteristics can have a significant impact on the competitiveness of a market.

The Guidelines, however, also consider markets with fewer than six firms to be concentrated.[3] In such a market, the Guidelines presume that small changes in the level of concentration are likely to create or enhance market power or facilitate its exercise.[4] There is no basis for this presumption. Many markets with higher levels of concentration behave competitively, due in part at least to the presence of factors such as those described in Section 2.1 of the Guidelines. Moreover, the economics literature provides no theoretical or empirical basis for the existence of a unique critical concentration level above which the

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[2] It is interesting to observe that the same increased tendency to merge occurred in other industries that had a great deal of excess capacity as they entered a period of reduced regulation. Two clear examples occurred with the virtual end of airline regulation in 1978 and of federal motor carrier regulation in 1980. The earlier regulation had kept rates above competitive levels, which allowed inefficient suppliers to function profitably. The introduction of competition made it necessary to reduce costs.

[3] Specifically, the Guidelines define markets with a Herfindahl-Hirschman Index (HHI) above 1800 to be concentrated. A market with an HHI of 1800 is mathematically equivalent to one with 5.56 equal-sized firms each with an 18% share.

[4] Specifically, these presumptions apply to mergers that increase the HHI by at least 100 points. An increase in the HHI from 1800 to 1900 increases the share of an equal-sized firm from 18% to 19% and reduces the number of equal-sized firm equivalents only from 5.56 to 5.26.

exercise of market power is likely or for the specific concentration levels identified in the Guidelines.

This study provides a review of the theoretical and empirical economics literature that addresses these issues. Some of the important conclusions that come from this review are:

- Overall, the economics literature does not provide the basis for a merger enforcement policy based principally on concentration levels.
- The results of the theoretical models are quite sensitive to each model's assumptions.
- The principal model (i.e., Cournot) that predicts a relationship between the HHI and greater-than-competitive pricing does not indicate the existence of any critical concentration level, including the 1800 HHI level used in the Guidelines.
- The assumptions of the Cournot model are generally unrealistic and do not accurately describe the behavior of most firms.
- More sophisticated Cournot-type models take into account the importance of non-concentration factors such as differences in cost structure among firms, product heterogeneity, different demands faced by different firms, buyer concentration, and the frequency of transactions.
- Many of the non-concentration factors that make greater-than-competitive pricing unlikely are present in hospital markets.
- Some versions of other models with more realistic assumptions (e.g. Bertrand) indicate that only a small number of firms are needed to achieve

a competitive result.

- Recent research involving dynamic oligopoly models indicates that, rather than concentration levels, the principal determinant of greater-than-competitive pricing by a group of competitors is the group's ability to quickly detect and punish competitive pricing by individual members. This ability does not characterize hospital markets.
- Much of the empirical literature suffers from fundamental problems (e.g. the failure to define antitrust markets) that cause their results to be unreliable.
- The empirical literature does not indicate the existence of any unique critical concentration level, including the 1800 HHI level used in the Guidelines.
- Even when the empirical literature identifies statistical relationships between higher prices and concentration, these relationships
  - vary from study to study
  - vary from industry to industry
  - often indicate only a small price impact associated with increased concentration.
- There are very few empirical studies that look at hospitals. These studies suffer from some of the basic statistical problems present in studies of other industries. Moreover, they provide no basis for employing concentration levels as the primary determinant of antitrust merger enforcement or for establishing a critical concentration level.

II. Background and Overview

The Horizontal Merger Guidelines issued on April 2, 1992 by the United States Department of Justice and the Federal Trade Commission describe the analytical framework and specific standards used by the federal antitrust agencies in analyzing mergers. The Merger Guidelines specifically state in their introduction that because these standards, "…must be applied to a broad range of factual circumstances, mechanical application of those standards may provide misleading answers to the economic questions raised under the antitrust laws." The introductory section concludes: "…the Agency will apply the standards of the Guidelines reasonably and flexibly to the particular facts and circumstances of each proposed merger." [Emphasis added.]

Other sections of the Guidelines, however, identify concentration levels that create presumptions that mergers in these markets will reduce competition. A review of the economics literature, both theoretical and empirical, indicates that there are no numerical concentration standards that apply across product and service markets. Consequently, this literature supports the need to maintain the flexibility in analyzing mergers emphasized in the introduction to the Guidelines, while viewing concentration levels as a secondary consideration at best in evaluating the effects of mergers.

The application of the Guidelines' standards is designed to address their unifying theme, which is that mergers should not be permitted to create or enhance market power or facilitate its exercise. Market power held by a seller or group of sellers refers to their ability to profitably maintain prices above competitive levels for a significant period of

time.[5] Specifically, the Guidelines indicate that mergers can have adverse competitive consequences in two general ways: by making coordinated interaction among firms more likely, more successful, or more complete or by enabling a merged firm to exercise market power unilaterally.

Particularly with regard to analyzing coordinated interaction, the first step in analyzing a merger under the Guidelines is determining if a merger would significantly increase concentration and result in a concentrated market. The Guidelines state that markets in which the Herfindahl-Hirschman Index ("HHI") is above 1800 are considered to be highly concentrated.[6] The Guidelines state that mergers producing an increase in the HHI of more than 50 points in a highly concentrated market potentially raise significant competitive concerns, depending on other factors. The Guidelines also indicate that the agencies will presume that mergers in highly concentrated markets that increase the HHI by more than 100 points are likely to create or enhance market power or facilitate its exercise. This presumption may be overcome through a consideration of other factors such as those described in Sections 2 through 5 of the Guidelines.

The Guidelines' recognition that factors other than concentration are relevant in analyzing the competitive effects of mergers, even in highly concentrated markets where the HHI exceeds 1800, is consistent with the economics literature. Simply, the economics

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[5] The Guidelines make clear that the potential exercise of market power by buyers, which depresses both price and output, will also be examined. This view is consistent with an enforcement policy seeking to maximize overall economic welfare ("…the result of the exercise of market power is a transfer of wealth from buyers to sellers or a misallocation of resources.") While related, preventing the exercise of market power and maximizing overall economic welfare are not identical. A pure economic-welfare standard would require a more central role for consideration of cost savings. In addition, Joseph Farrell and Carl Shapiro (1990a, pp. 107-126) show that in a Cournot oligopoly, mergers can both raise price and increase welfare. Cournot models of oligopoly provide the theoretical economic basis for much of the Guidelines' methodology.

[6] The HHI is calculated by summing the squares of the individual market shares of each market participant.

literature provides no theoretical or empirical basis either for the existence of a unique critical concentration level above which the exercise of market power is likely or for a specific critical HHI level of 1800. The absence of a universal critical level of concentration that would apply across markets simply reflects significant differences in the structural and behavioral characteristics of these different markets. In particular, there is no credible study indicating that the evaluation of hospital mergers should start with the presumption of enhanced market power in markets with HHIs over 1800.

The question to be addressed in analyzing a merger is as follows: for a particular market with particular non-concentration structural and behavioral characteristics, to what extent does a change in concentration increase the likelihood that market power will be exercised? To address this question it is necessary to understand what a particular HHI level means. Any HHI level indicates the share that would be held by one firm if all firms in the market held identical shares. That is, the HHI translates actual market structures into a hypothetical market where all firms have the specific share indicated by the HHI. For example, an HHI of 1800 indicates a market where all firms have the mathematical equivalent of an 18.00% share, which in turn is equivalent to a market with the equivalent of 5.56 equal-sized firms.[7] A change in the HHI of 100, which under the Guidelines creates a presumption of enhanced market power, only has the effect of raising the share of each equal-sized firm from 18% to 19% and reducing the number of equal-sized firms from 5.56 to 5.26, a reduction of less than one-third of a firm. Similarly, a change in the

[7] If each firm has an 18% share, then there will be (100%) ÷ (18% per firm) or 5.56 equal-sized firms. This is sometimes called the "numbers equivalent" of an HHI. It can be calculated quickly by taking the reciprocal of the HHI (in its decimal form bounded by 0 and 1). That is, 1/.1800 = 5.56. See Waterson (1984, p. 169). Obviously, there is no such thing as a fractional firms in real markets.

HHI of 200 (i.e., from 1800 to 2000) only reduces the number of equal-sized firms by slightly more than one-half of a firm from 5.56 to 5.00. In fact, a reduction of one equal-sized firm in this HHI range requires a change in the HHI of approximately 400 or 500.[8] Similarly, a change in the HHI from 2500 to 3333 (i.e., a change of 833) reduces the number of equal-sized competitors from 4 to 3.

Understanding the meaning of the HHI underscores the large changes in the HHI necessary to create a relatively small change in the number of equal-sized competitors and to contrast this change with the effects of non-concentration factors. Non-concentration factors are potentially important in merger analysis because successful coordination requires that a group of firms reach terms that are profitable for each of the firms involved.[9] The coordination problem facing any group of firms attempting to exercise market power is related to the tension between individual incentives and group incentives. Non-concentration factors are relevant because they bear directly on whether individual firms may have incentives to deviate from any terms of coordination reached by the group. In order for a merger that does not create a dominant firm to reduce competition, conditions in that market must be conducive to having firms ignore their individual incentives and coordinate their actions to pursue group goals.

The common element in evaluating the significance of non-concentration factors is the extent to which their presence creates incentives for a particular firm to abide by or cheat on a group agreement. Simply, a firm can be expected to cheat if it expects cheating

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[8] An increase in the HHI from 1800 to 2195 or almost 400 is the equivalent of a reduction in the number of equal-sized firms from 5.56 to 4.56. A change in the HHI from 2000 to 2500 is the equivalent of a reduction in equal-sized firms from 5 to 4.

[9] Merger Guidelines, § 2.1.

to be profitable. More specifically, a firm will lower its price or fail to raise its price if it expects to receive additional sales to more than offset the reduced margin associated with the lower price. There are a variety of non-concentration factors that potentially affect the incentives to cheat, including differences in cost structure and firm demand.[10] The impact of cost differences may be particularly important because such differences are an implication of many formulations of the Cournot-like models of oligopoly, which are a principal theoretical foundation for the coordinated effects sections of the Merger Guidelines. Moreover, as the discussion below describes, most of the more sophisticated theoretical models indicate that the timing and likelihood of retaliatory actions by an oligopoly against a non-cooperating member are much more important in determining whether market power is exercised than is concentration.

The remainder of this appendix is organized into three sections. Section III reviews the theoretical bases for the Guidelines. Section IV reviews the empirical literature. Section V considers how the basic economic results identified in Sections III and IV are affected by mergers that produce cost savings.

III. Oligopoly Models and the Merger Guidelines

The theoretical foundations for coordinated behavior and unilateral behavior differ. Generally, the theoretical foundations for coordinated behavior involve Cournot-type models, while the foundations for unilateral behavior involve Bertrand-type models.

Before describing the various models that provide the theoretical underpinnings of

[10] For example, see Section 2.1 of the Merger Guidelines.

the Guidelines, it is useful to compare how prices are theoretically affected by different stylized industry structures. Following the example of Robert Willig, market price-cost equilibrium under different market behavior can be summarized by the following relationship:[11]

$$(P-c)/P = H\beta/E$$

where P is the market price, c is the marginal cost of the market product, H is the HHI expressed as a decimal (bounded by 0 and 1 instead of 0 and 10,000), E is the market elasticity of demand for the product, and ß is a parameter that describes market behavior. Competitive behavior is described by ß=O, which implies that no firm alone has the ability to affect price. When ß=O, price equals marginal costs. Pure cartel behavior is described by ß=1/H, which implies that the price-cost margin [(P-c/P] equals the inverse of the demand elasticity (i.e., the lower the elasticity the higher the price). Finally, the intermediate case of Cournot behavior is described by ß=1. Under Cournot behavior, the price-cost margin is determined by both concentration levels (i.e., the HHI) and the market demand elasticity.[12]

It is this relationship between the price-cost margin and the HHI that makes Cournot-like models so important in understanding the theoretical underpinnings of the Guidelines. With this background, an overview of Cournot and other oligopoly models is

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[11] Willig (1991, p. 287).

[12] As an example, assume marginal cost equals one, and market demand elasticity equals one. Under these assumptions the basic Cournot model indicates that a change in the HHI from 1800 (H=0.18) to 1900 (H=0.19) raises price from 1.22 to 1.23 or about 1%. A change in the HHI from 1800 to 2500 raises prices from 1.22 to 1.33 or about 9 percent.

presented.[13] In the basic Cournot model there are n firms that compete in the sale of a homogenous good. These n firms need not have identical cost curves. Each firm simultaneously chooses its output under the assumption that the output of other firms in the market is set. More specifically, each firm attempts to set its output at a level that maximizes its profits given the assumed output decisions of its rivals. Individual firms do not explicitly set price, but, rather, price adjusts to clear the market (i.e., price moves to the level where quantity supplied equals quantity demanded).

When an industry behaves as postulated by the Cournot assumptions, each firm's price-cost relationship is described by:

$$(P-c_i)/P = S_i/E$$

where P is the market price, c_i is the individual firm's marginal cost, S_i is the individual firm's market share, and E is the market elasticity of demand. When these individual firm price-cost relationships are summed across firms (weighted by each firm's market share), the market-wide price-cost relationship becomes:

$$(P-C)/P = H/E$$

where P is still the market price, C is industry cost, H is the HHI expressed as a decimal, and E still reflects market elasticity. That is, under the Cournot assumptions the price-cost margin increases as concentration increases and as market elasticity declines. It is this relationship which is the fundamental theoretical basis for the use of the HHI in the merger

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[13] Most of this discussion is based on surveys by Shapiro (1989), Tirole (1988), Fundenberg and Tirole (1989), and Jacquemin and Slade (1989), as well as articles by Ordover, Sykes and Willig (1982), Willig (1991), Hay and Werden (1993), Scherer (1980), Farrell and Shapiro (1990b), McAfee and Williams (1988), and Stigler (1964).

Guidelines.[14]

The Cournot assumptions have been criticized as being unrealistic, particularly their failure to allow firms to vary their own pricing, their failure to tie lower price-cost margins to increased social welfare, and their static nature.[15] As Shapiro (1989, p. 343) notes:

> A natural objection to the Cournot quantity models is that in practice businesses choose prices rather than quantities as their strategic variables. Indeed, the actual process of price formation in Cournot's theory is somewhat mysterious.

The Cournot model's failure to incorporate the pricing behavior of individual firms is particularly important with regard to antitrust policy because it is the price-cutting strategy of individual firms that is at the heart of any lessening of competition that might result from coordinated interaction.[16] In response to this omission in the Cournot model, Bertrand introduced a model where each firm in a market simultaneously sets its price under the assumption that the prices of competing firms are given. With this simple change in assumed firm behavior (i.e., firms are free to vary price (Bertrand) rather than quantity (Cournot)), the results change dramatically. Specifically, if it is assumed that all the firms produce the same product at equal constant marginal costs, the Bertrand model indicates that each firm will set price equal to marginal cost. This result is independent of the number of competitors, so long as there are at least two of them. If the Bertrand

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[14] As Shapiro (1989, p. 337) explains, the Cournot equilibrium is not Pareto optimal from the perspectives of the firms but, rather, maximizes some weighted sum of social welfare and profits. Clearly, the pure collusion solution would increase the firms' profits but would reduce the welfare of consumers. Also under the Cournot assumptions the level of output is not produced at the least-cost level, with the larger firms underproducing relative to the smaller firms.

[15] The simple Cournot model assumes that each firm continues to set its quantity level based on beliefs about its competitors that may turn out to be inaccurate. More sophisticated models attempt to incorporate these changing beliefs into the model. These more sophisticated models, however, generally fail to provide the simple concentration-price relationship that results from the basic Cournot model.

[16] Guidelines, § 2.1

assumptions are changed slightly so that the firms' costs can differ, but products continue to be homogenous and firms continue to have constant marginal costs, then the single most efficient firm supplies the whole market at a price just below the cost level of the next most efficient firm. Again, this particular result is independent of the number of firms that could supply the market.

Other adjustments to the basic assumptions of the Bertrand model can dramatically change these results. For example, in the case where firms produce homogenous goods in the range where they experience increasing returns to scale, pricing remains at marginal cost but fails to cover average cost.[17] Similarly, the Bertrand model with homogenous goods fails to establish an equilibrium when firms are producing in the range where they experience decreasing returns to scale up to some capacity constraint.

To summarize, the basic Bertrand model with homogenous goods only identifies equilibria in the case of constant returns to scale. This equilibrium is one in which price equals marginal cost (i.e., the desired competitive result) without regard to either the number of firms in the market or the market elasticity of demand. Consequently, the Bertrand model is not a good theoretical basis for a reliance on concentration levels in analyzing coordinated interaction in a market with homogenous goods.

The Bertrand model, however, does provide some theoretical basis for the

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[17] Shapiro (1989, pp. 344-5) notes that, "Adding even a small fixed cost to the basic Bertrand model of constant costs causes non-existence of equilibrium. Since oligopoly theory is most relevant in markets with significant scale economies, this lack of existence (or reliance on mixed strategies) must be considered a serious drawback to the application of Bertrand equilibria." In a footnote, Shapiro notes that by considering the timing of production and pricing, Bertrand models may produce equilibria. In addition, consideration of exit and expanded production by the surviving firms may either signify a natural monopoly or move the surviving firms out of the range of production where increasing returns to scale exist.

Guidelines' unilateral effects standards because it identifies other equilibria when the goods produced by competing firms are heterogeneous. The specific nature of the equilibrium for heterogeneous goods depends, in part, on the specific sets of demands for the competing products. With regard to the impact of a merger on prices, the model indicates that the greater the share of at least one of the merging parties and the smaller the own-price elasticities facing the competitors, the greater the price impact.[18] While the Bertrand model with heterogeneous goods may indicate that shares matter in evaluating the competitive consequences of mergers under certain narrowly defined conditions, it does not provide any support for the particular concentration standards used in the Merger Guidelines.

These basic models present antitrust enforcers with a dilemma. The Cournot model of quantity competition does provide a nexus between concentration (specifically the HHI) and market performance, but it is based on behavioral assumptions that are not generally realistic.[19] By contrast, the Bertrand models employ more realistic assumptions but fail to

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[18] See Willig (1991, pp. 299-305). The importance of shares in this version of the Bertrand model is a partial reflection of an assumption that a higher share reflects the attractiveness of that product as a substitute for the product of its merger partner. Because of the heterogeneous nature of the products under consideration, this assumption need not be accurate. Willig (p. 301) notes that when these assumptions are not accurate, "…merger analysis that focuses exclusively on market shares is likely to go awry." While Willig does discuss the value of concentration in understanding the effect of a merger involving heterogeneous products under some well-defined conditions (including the lack of specific information concerning the demand for the various products in the market), he ultimately concludes that, "It is critical to recognize that this conclusion rests sensitively on the substance of the assumptions." In particular, he notes that, "The analysis here [i.e., the use of shares] also points to the strong need to develop information beyond shares in markets with differentiated products, particularly the relative proximity of the products of the merging firms in the space of salient characteristics."

[19] The Cournot assumptions also fail to capture the extent to which firms attempt to steal business away from competitors. This failure is critical because it is such competition that antitrust merger enforcement is designed to protect. The importance of this interfirm rivalry is captured in Ordover, Sykes and Willig (1982), which incorporates a term reflecting interfirm rivalry into the basic Cournot model. In particular, the authors conclude (pp. 1872-3):

> Finally, we have demonstrated that changes in the value of the Herfindahl Concentration Index can be useful indictors of the effects of mergers, provided that such changes are evaluated in light of other evidence concerning the efficiency gains from the merger, the elasticity of market demand, the market share and supply

provide a clear relationship between concentration and market performance. This dilemma is addressed by Shapiro (1989, p. 351):

> The choice between a pricing game and a quantity game cannot be made on a priori grounds. Rather, one must fashion theory in a particular industry to reflect the technology of production and exchange in that industry. For example, competition via sealed bids between firms without capacity constraints fits the Bertrand model quite nicely, whereas competition to install sunk productive capacity corresponds to Cournot.

In a footnote, Shapiro notes that the most appropriate models to study are dynamic ones with price-setting, which he later considers in his review of the "price-setting supergame" literature.[20] Again, Shapiro (1989, pp. 356-7) provides a succinct overview of these models:

> The limitations of static oligopoly have been evident at least since Stigler's (1964) classic paper. Stigler identified and stressed the importance of such factors as the speed with which competitors learn of a rival's price cut, the probability that such a competitive move is in fact detected, and the scope of retaliation by the other oligopolists. Stigler's view of oligopoly theory as a problem of policing a tacitly collusive industry configuration is now the norm. In the years since Stigler's paper was published, a great deal of work has been done to develop the theory of tacit collusion, particularly the role of defections and the reactions to them.
>
> Quite generally, the success of oligopolists in supporting a tacitly collusive scheme depends upon their ability to credibly punish any defector from the scheme. Stronger, swifter, or more certain punishments allow the firms to support a more collusive equilibrium outcome.

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elasticity of the actual and potential competitive fringe, and most importantly, the nature of interfirm rivalry in the market.

[20] The term "supergame" refers to models where there are infinite repetitions of price or quantity setting by firms in the market, with the ability to respond to previous decisions made by rivals. Most of these models continue to have prices set simultaneously by the competitors. The importance of a firm's ability to respond to previous decisions made by rivals is that it allows each firm to evaluate this behavior and consider its impact in making its current and future decisions.

The Stigler model cited by Shapiro does predict that price-cost margins should be roughly proportional to the HHI but does not predict either a critical HHI level or a unique relationship between the HHI and the exercise of market power that would apply across different markets.[21] Moreover, Stigler identifies buyer and seller homogeneity, the number of buyers, and frequency of sales as affecting the relationship between concentration and price. That is, intermarket differences among non-concentration factors are important in understanding the competitive impact of mergers. Abstracting from these intermarket differences, Stigler's theory, as described by Weiss (1974),

> …examined the conditions contributing to the enforcement of effective cartels. The participants in effective cartels must be able to detect secret price cutting. The evidence of such 'chiseling' is the diversion in sales in excess of what would occur by chance. He concluded that fewness of sellers and disparity of relative seller size both make the detection of chiseling easier, though the effect of additional sellers diminishes rapidly after the second one. He also predicted that the effectiveness of seller collusion would decrease as buyer concentration rose. His theory pointed unequivocally to a positive relation between concentration and price.

The literature on dynamic oligopoly models, including those involving supergames, supports Stigler's insight that interfirm cooperative behavior depends critically on the ability of the firms to detect and punish any deviations from the group profit-maximizing price level. Basically, these models indicate that when deviations from this price level can be observed quickly, it does not pay any firm to increase short-term profits by reducing price at the expense of lowering long-term coordinated prices. These results are summarized by Shapiro (1989, p. 364):

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[21] Despite his theory, Stigler presented some rudimentary statistical results in his 1964 paper suggesting the existence of a high critical HHI. Specifically, he reported (p. 5) that:

> In general the data suggest that there is no relationship between profitability and concentration if [the HHI] is less than [2500] or the share of the four largest firms is less than about 80 percent.

> This leads us to one of the most important conclusions with genuine policy implications that comes out of oligopoly theory. Whatever one believes about the various π's [profit payoffs], it is clear that lower values of ∂ [a discounted and probability adjusted measure of the cost to competitors of non-cooperative behavior] inhibit tacit collusion. If industry behavior permits each oligopolist to rapidly and surely observe rival defections, the scope for tacit collusion is great. Policies designed to make secret price cuts possible are valuable in undermining tacit collusion, or "conscious parallelism." And industry practices that inhibit secret price-cutting should be subject to close antitrust scrutiny.
>
> The feasibility of tacit collusion when detection lags are short is rather sobering for those who would conclude on theoretical grounds that oligopolistic behavior tends to be quite competitive. After all, supergame theory tells us that the fully collusive outcome is an equilibrium, quite independently of demand conditions or the number of oligopolists, so long as firms can rapidly detect and respond to "cheating" on the tacitly collusive scheme. The lower prices threatened as a price war never actually are charged. Worse yet from the point of view of industry performance, structural remedies would appear to hold out little hope of undermining tacit collusion if swift reversion to a noncooperative equilibrium is possible. Nor need the entry of more firms improve industry behavior.

There are two principal problems with employing the dynamic oligopoly literature as a basis for antitrust merger policy: (1) there are numerous equilibria that result from it; and (2) it does not indicate that changes in concentration levels in the range identified in the Merger Guidelines affect the likelihood that market power will be exercised.[22] The specific problem associated with the existence of numerous equilibria is that, "…game theory does not predict the collusive outcome; it simply indicates that such an outcome is supportable as a noncooperative equilibrium." [Shapiro (1989), p. 379] That is, the dynamic oligopoly literature indicates that the collusive outcome is one of numerous possible outcomes.

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[22] A third and related problem is that other than identifying the importance of detecting noncooperative pricing by individual firms, the results of the dynamic oligopoly literature are very sensitive to the specific assumptions employed in the different models. Among other things, these assumptions differ in how individual firms react to observed industry behavior and the accuracy and speed in which the information on industry behavior is obtained. (Jacquemin and Slade (1989, pp. 443-9); Fundenberg and Tirole (1989, pp. 282-5)).

The second problem associated with this literature is that, in some sense, it proves too much. Under plausible conditions, when punishment is relatively severe and detection and punishment occurs quickly, interfirm coordination will produce a monopoly-like result even with a large number of firms.[23] That is, these models indicate that concentration matters but only far outside the range identified in the Merger Guidelines.[24]

The principal point to be drawn from this brief review of the theoretical literature of oligopoly behavior is that the determinants of interfirm behavior are varied and complex and that a simple change in pre-merger and post-merger concentration levels provides little basis for predicting changes in market conduct and performance. In fact, the overall literature provides little, if any, support for the specific concentration standards employed in the Merger Guidelines. More specifically, the literature does not provide support for the presumptions concerning the exercise of market power in markets with a post-merger HHI above 1800. The theoretical literature, however, does indicate the importance of non-concentration factors. As with many other points in this review, Shapiro (1989, p. 409) provides a clear summary of these conclusions:

> Let me close with a sort of user's guide to the many oligopoly models I have discussed. By "user," I mean one who is attempting to use these models to better understand a given industry (not someone out to build yet another model). Here is where the "bag of tools" analogy applies.

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[23] Shapiro (1989, pp. 365-366) considers a Cournot-type supergame model and finds that when detection and punishment are swift the monopoly result obtains if the number of competitors is no more than 400. Consideration of a Bertrand-type supergame model (p. 371) indicates that the monopoly-like result obtains unless the number of competitors is at least 100. These dynamic models also provide an apparent paradox in that the likelihood of cooperative behavior may be greater in potentially more competitive markets. The logic of this result is that potentially greater levels of competition imply a greater difference between the collusive outcome and the competitive outcome, which in turn implies a greater reluctance to deviate from the collusive result.

[24] The literature of dynamic oligopoly models include many variations such as changes in assumption about pricing rules, punishment rules, and the ability to detect deviations. Often the results are sensitive to the specific change. Generally, these extensions of the literature do not indicate that concentration matters in the range identified in the Merger Guidelines.

> After learning the basic facts about an industry, the analyst with a working understanding of oligopoly theory should be able to use these tools to identify the main strategic aspects present in that industry. One industry may be competitive because rapid expansions in capacity are possible in short order and consumers are willing to switch suppliers in response to small price differentials. In another industry, advertising may serve a key strategic role, since brand loyalty is significant. Yet another industry may succeed in achieving a tacitly collusive outcome because secret price-cutting is impossible. And so on. Hopefully, as further progress is made, we will learn about additional modes of strategic behavior and understand more fully the strategies already identified.

Similar views are expressed by other prominent economists. Fudenberg and Tirole (1989, p. 322) concluded:

> …at present we would not want to base important predictions solely on formal [i.e., theoretical] grounds. In evaluating antitrust policy, for example, practitioners will need to combine a knowledge of the technical niceties with a sound understanding of the workings of actual markets.

Similarly, Jacquemin and Slade (1989, pp. 448-9) state:

> At this stage some broad conclusions can be suggested. The most striking result is the multiplicity of theoretical possibilities for tacit collusion, …
>
> We return to the (too) broad result that almost all industries can be tacitly collusive almost all of the time. To go beyond this, it is necessary to analyze the particular circumstances of an industry in an attempt to determine the feasibility of collusion. In many cases, this will lead us back to the old notions of factors that facilitate or hinder collusion that were discussed in Section 2.

The failure of the theoretical literature to provide the basis for the Guidelines' concentration standards raises the question of whether these standards can be supported on the basis of empirical studies. The review presented in the next section of this appendix indicates that while the economics literature does provide some empirical support for a positive relationship between concentration and the exercise of market power, there is no

empirical basis either for the existence of a unique critical concentration level above which the exercise of market power is likely or for a specific critical HHI level of 1800. This inability to identify general concentration-based standards simply reflects the extent to which markets can differ in their structural and behavioral characteristics.

IV. Empirical Analysis

In this section of the study various empirical studies of the competitive effects of market structure are examined and summarized. As in the theoretical literature, the empirical literature provides no basis for the application of specific concentration standards to be used across different markets, and thus, supports a flexible approach to merger policy. The overall focus is to identify the extent to which the empirical evidence shows that concentration has an impact on prices. More specifically, this section considers whether any impact occurs at critical concentration levels. Additionally, the issue of whether the effects of concentration on prices are similar across industries is addressed.[25]

The overall conclusions that are drawn from the review is that the empirical studies: (1) suffer from fundamental problems that render their results unreliable; (2) provide ambiguous results that differ among studies and across industries; (3) generally identify a relatively small price impact associated with increasing concentration; and (4) do not identify a critical concentration level that would be applicable across markets.

The small number of hospital-specific studies report ambiguous results and do not provide a basis for employing concentration as the primary determinant of antitrust merger enforcement or for establishing a critical concentration level.

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[25] A list of the publications reviewed for this section on empirical analysis appears in Exhibit A. The discussion in this section also relied on four survey pieces: Pautler (1983), Weiss (1989), Schmalensee (1989), and Werden (1991).

Before describing the empirical studies, a number of fundamental shortcomings typically present in this type of research are noted. These problems are important and may make this literature unreliable as a basis for antitrust policy.

First and foremost is the problem of market definition and, as a consequence, the measurement of concentration. While these studies often use the best concentration data available, these data are often preexisting and do not generally correspond to antitrust markets. That is, concentration data may be used for a particular set of products and geographic areas even when the products and geographic areas do not correspond to relevant product and geographic markets.

Failure to define relevant markets in these empirical studies can be a significant problem. Experience with actual merger investigations indicates that market delineation can be difficult and that slight differences in market definition can lead to major differences in measures of concentration. Viewed from this perspective, the results of any concentration studies that rely on data not specific to relevant antitrust markets must be considered suspect. Simply, these data would typically not withstand the scrutiny of standard merger analysis.

The serious conceptual flaws of concentration/profit studies, and the relative advantages of concentration/price studies are explained below. Briefly, the flaws in the concentration/profit studies occur because the goal in measuring anticompetitive effects is to determine whether prices are above the competitive level (as a proxy for a welfare loss). Since profits can be increased either by increased prices or by decreased costs, changes in profits do not necessarily reflect changes in prices. Indeed, estimation bias may be

introduced to the extent that costs are inversely correlated with concentration.[26]

There is still the potential for major practical weaknesses in empirical studies even when price data are used, particularly when the product being studied varies among suppliers (i.e., it is heterogeneous). When products are heterogeneous, price differences may simply reflect product differences which in turn may cause costs to be different. When cost data are taken into account in an attempt to alleviate this problem (by using price-cost margins), many of the errors associated with using profits data are reintroduced. Once again, there is a fundamental problem with the analysis, which may cause these results to be biased and unreliable as a foundation for policy.

Finally, even if the conceptual problems inherent in using profit or cost data in these studies could somehow be eliminated, a practical problem still arises because of the reliance on accounting data. The standards used when collecting data for accounting purposes do not necessarily comport with those of economic theory.[27]

A. Concentration/Profit Studies

The earliest empirical studies in industrial organization analyzed the effect of concentration on profit, not price. For example, in his pioneering 1951 article, Joe Bain studied the relationship between concentration and profits, and found a positive correlation.[28] For about 15 to 20 years, the empirical work in this area focused on the concentration/profit correlation. Subsequent studies modified the original Bain approach

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26 Demsetz (1973) and Peltzman (1977).

27 Fisher and McGowan (1983).

28 Bain (1951).

by accounting, for example, for entry barriers in different ways, adjusting the way in which profit was measured, or using different industry samples.[29] In 1974 Leonard Weiss reviewed 46 of these studies and found that 42 of them showed a positive correlation between profits and concentration.[30] Schmalensee notes however, that there have been many other studies that have found no significant linear relationship between concentration and profitability.[31] Others have even found statistically significant negative correlations between concentration and profitability.[32] Werden points to other survey articles on this subject.[33] He agrees that they are of little use now, and provides a comprehensive historical summary of work on the topic.

These early studies suffer from the fundamental flaw that anticompetitive effects are better measured by prices than by profits. That is, the goal of the analysis is to measure the extent to which prices exceed the competitive level. While profits can vary because of differences in prices, they can also vary because of differences in costs. Where scale economies exist, higher concentration may be associated with lower costs, which will then indicate that higher concentration is associated with higher profits. When it is the result of lower costs, a positive concentration/profit relationship is hardly evidence of a relationship between concentration and market power. Furthermore, the profit and cost data generally

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[29] Some of the more important work during this era includes: Bain(1956), Mann (1966), and Stigler (1963).

[30] Weiss (1974).

[31] Comanor and Wilson (1967), Comanor and Wilson (1974), Ornstein (1972), Ornstein (1975), Vernon and Nourse (1973), Boyer (1974), Gort and Singamsetti (1976), Cattin and Wittink (1976), Porter (1976), Strickland and Weiss (1976), Martin (1979a), Martin (1979b), Lindenberg and Ross (1981), and Bradburd (1982).

[32] Grabowski and Mueller (1978), Connolly and Hirschey (1984), and Hirschey (1985).

[33] Ross and Scherer (1990), Ch. 11; and Salinger (1990).

available for these studies are accounting data, with their own inherent flaws.[34] In an attempt to address these issues, new studies replaced measures of profit with prices.

B. Concentration/Price Studies

Despite the conceptual advantages of using prices rather than profits, there are practical limitations on this type of research. Systematic data on prices are generally harder to find than those on profits. Nevertheless, research was undertaken in some industries where data were available.

In his 1983 survey article, Pautler summarizes the empirical results of studies in numerous industries, including banking, bonds, food chain stores, retail gasoline, and newspapers.[35] In addition, Weiss's 1989 book describes price/concentration studies of additional industries such as cement, auctions, labor, airlines, rail freight, and beef cattle. The Weiss book also contains new price/concentration studies on gas stations, supermarkets, and banking.[36] Schmalensee's 1989 chapter in the Handbook of Industrial Organization, Volume II also notes studies in life insurance, banking services, air transportation, newspaper and radio advertising, bond under-writing, gasoline retailing and groceries.[37] Finally, Werden's 1991 survey covers studies on many of these same

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[34] Demsetz (1968), Demsetz (1973), Brozen (1970), Bork (1969), Peltzman (1977), Liebowitz (1982), Fisher and McGowan (1983), Benston (1985), Fisher (1987b), and Liebowitz (1987).

[35] Bell and Murphy (1969), Aspinwall (1970), Heggestad and Mingo (1976), Hester (1979), Kessel (1971), Marion et al. (1979), Lamm (1981), Marvel (1978), Landon (1971), and Bodoff (1975).

[36] Koller and Weiss (1989), Brannman et al. (1987), Belman and Weiss (1989), Stigler (1964), Ferguson (1983), Bloch & Wirth (1985), Town & Milliman (1989), Berry (1988), Briggs, (1989), MacDonald (1989), Marion and Geithman (1989), Marvel (1989), Weiss (1989), and Berger & Hannan (1989).

[37] Cummins et al. (1972), Gilbert (1984), Bailey et al. (1985), Thompson (1984), Stigler (1964), Cotterill (1986), and Geithman et al. (1981).

industries, with updates.[38] More recent empirical work on the concentration/price relationship was also reviewed for this study.[39] While there are exceptions, these concentration/price studies tend to show a positive relationship between concentration and prices. Although these studies generally show a relatively small price effect, they do not identify a critical concentration level at which anticompetitive effects occur. Thus, while they lend some support to the Guidelines approach of considering concentration data in screening mergers, their overall findings support retention of policy emphasizing flexibility in analyzing the effects of non-concentration factors in the particular markets.

The studies of the banking industry provide a good overview of the empirical work that looked at price and concentration. More studies have probably been done on banking than any other industry, possibly because of the relative availability of price (i.e., interest rate) data. Comparisons across studies are interesting in the banking industry because of the wide variety of conclusions and policy implications reached by the studies despite the relatively homogeneous nature of the products.[40]

Weiss has concluded that the banking concentration/price studies provide "massive" support for the hypothesis of a positive correlation between concentration and price.[41] Yet, as Werden points out, the majority of the banking studies in Weiss' book did not find a

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[38] Werden categorizes the studies that he reviews under the headings: 1) Direct Evidence of the Effect of Mergers on Prices, 2) Evidence from the Stock Market on the Effect of Mergers on Prices, and 3) Evidence on the Relationship Between Concentration and Price in Particular Industries. Some of the key additional articles reviewed by Werden include Barton and Sherman (1984), Borenstein (1990), Werden et al. (1991), Moore (1986), Hurdle et al. (1989), Masson and Allvine (1976), Kaufman and Hardy (1989), and Anderson (1990).

[39] See Exhibit A.

[40] Note that the conclusions from the earlier studies should be interpreted particularly carefully because they were done during a period of price regulation.

[41] Weiss (1989, p. 259).

significant positive correlation between concentration and price.[42]

Among the studies reviewed by Weiss was an early piece by Edwards.[43] In this study, Edwards looked at small loans made during 1955 and 1957. Metropolitan areas were the units of observation. Edwards regressed loan interest rates on concentration ratios and other control variables. He found a positive relationship between concentration and price, but the magnitude of the relationship depended on bank size (measured in assets) and macroeconomic conditions. For example, the relationship "largely disappeared" during times of tight money in 1957. Although this was one of the earliest empirical studies of the concentration/price relationship in banking, Weiss concluded that Edwards "made most of the right decisions" when doing the empirical work, and that the study's faults are not very serious.[44] Nonetheless, the study does not provide a blueprint for general merger policy because it is not clear, for example, whether tight money or loose money is the norm in banking, nor is it clear how this or other factors might transfer to any possible concentration/price relationship in other industries.

This uncertainty is illustrated by a numerical example using the variations in Edwards' results. In 1955, for loans to firms with assets of one to fifty thousand dollars, Edwards found that a ten-point increase in the three-firm concentration ratio increased price a statistically significant 3.0%. In 1957, the same increase in the concentration ratio

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42 Werden (1991, p. 7). Only twenty-one out of the 47 studies covered showed a positive significant correlation. See Weiss (1989, p. 259).

43 Edwards (1964).

44 Weiss (1989, p. 237).

increased price for the same category of firms by a statistically insignificant 1.2%.[45]

A later study by Bell and Murphy examined the relationship between regular checking account annual service fees, various alternative concentration ratios, and control variables.[46] They used data from 14 different "market areas" and found a positive relationship between these service fees and concentration. In particular, they found that a "ten percent increase in the concentration ratio results in a two percent increase in price."[47] As mentioned above, in a market with firms of equal size a three-firm concentration ratio of 54 is about the same as an HHI of 1800. In this range of concentration, a ten percent increase in the three-firm concentration ratio, to about 59, is an increase of about five concentration-ratio points. If the firms were equal in size, the HHI would be increased to approximately 1980. Thus, according to this research, an increase in the HHI of 180 points would increase price two percent. This finding is interesting because it is much smaller than the five percent price increase used in the Merger Guidelines to define markets. Also, as Pautler notes, the authors felt that this finding could not be used to deny bank mergers because they also found evidence of economies of scale.[48]

Aspinwall evaluated the effects of concentration on mortgage rates.[49] For concentration variables he alternatively used the three-firm concentration ratio in

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45 A market with 5.56 equal-sized equivalent firms, each with a market share of 18 percent, has an HHI of 1800. The three-firm concentration ratio for this market is 54. A three-firm concentration ratio that is ten points higher (i.e., 64%), is the equivalent of an HHI of 2133 if the firms are equal in size. Thus, according to this research, an increase in the HHI of about 332 points is necessary to increase price by 1.2 to 3.0 percent.

46 Bell and Murphy (1969).

47 Ibid., p. 12.

48 Pautler (1991, p. 616).

49 Aspinwall (1970).

time-deposits and the number of mortgage-lending institutions on contractual mortgage rates in each SMSA during 1965. There were 31 SMSAs in his sample. Although Aspinwall does not make any specific recommendations for merger policy, he concludes that there is substantial support for the premise that market structure affects prices (i.e., interest rates). Aspinwall found that the mortgage interest rate increased about ten basis points when the three-firm concentration ratio increased by 20 points.[50] Using the comparisons made above, if the three-firm concentration rate increased ten percent (i.e., five percentage points) from 54 to 59, Aspinwall's results would predict that the interest rate would rise by about 2.5 basis points, which would be a mortgage rate increase of only about one-half of one percent to a level of 5.645%, using the starting mean mortgage rate in his sample of 5.62%.

Pautler also reviewed an article by Heggestad and Mingo which found yet another form of the concentration/price correlation in the banking sector.[51] These researchers evaluated the relationship between the HHI and market shares on several different interest rates for 332 banks in 69 SMSAs. One of their key findings was a nonlinear relationship between each of the interest rate variables and the HHI. In particular, they found that increases in concentration had a larger effect in markets that were initially unconcentrated. Another surprising result was that each bank's own market share was insignificantly correlated with any interest rate or service charge. The implications of this study for merger policy are peculiar. According to this research, all else equal, mergers in less

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[50] Ibid., p. 10. A basis point is 1/100th of an interest rate point. Thus, if an interest rate rose from 7.00 % to 7.50%, it increased by 50 basis points.

[51] Heggestad and Mingo (1976).

concentrated markets are more worrisome than those in more concentrated markets. Also, the results of this study suggest less enforcement concern should be focused on mergers that might create unilateral market power, and more should be targeted at mergers that would increase the probability of collusion.

Weiss describes a study by Scott in which monthly data were examined for two years from 70 banks for 29 metropolitan areas.[52] Scott compared interest rates on small business loans to three different concentration measures: the three-firm concentration ratio, the HHI, and HHI-1/N. The ratio, 1/N is the value of the HHI with N equal-sized lenders, so HHI-1/N is an index of bank size inequality that basically does not measure concentration. Scott found that, although the estimated coefficients on all of these alternative variables were statistically significant, this last concentration measure gave the best fit in his regressions. This result led him to conclude that the effect of concentration worked mainly through price leadership. If merger policy were based on Scott's findings, mergers leading to high concentration levels could be allowed, especially if they tended to make the size distribution of firms in the market more equal. Note that Scott's conclusion on the role of price leadership, as compared to collusive pricing, is contrary to that of Heggestad and Mingo.

The final banking article reviewed is a survey piece identified by Werden.[53] This article by Gilbert reviews about 20 years of concentration/price studies in the banking industry. As Werden reports, four of the five studies that Gilbert identified as being

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52 Scott (1977).

53 Gilbert (1984).

statistically valid, show a positive correlation between price and concentration.[54] Despite these results, Gilbert is hesitant to draw broad policy conclusions based on these studies. He says:

> The fact that the better studies report results that are the most consistent with the structure-performance hypothesis does not necessarily imply that higher market concentration leads to more effective collusion among banks. Studies in this field have only begun to determine whether challenges to the structure-performance framework are relevant for the banking industry.

C. Critical Concentration Level

Critical concentration levels could, in principle, provide a basis for a merger policy based on strict numerical standards. If anticompetitive behavior were limited only to concentration levels in a certain range of concentration, then merger policy would have a clear goal of simply preventing mergers that raised concentration levels into this range.

In general, critical concentration levels can be divided into two basic categories, each of which is a threshold below which there are minimal concerns about anticompetitive effects. For one of these types of thresholds, anticompetitive effects can be regarded as occurring suddenly and significantly above the critical level. For the other type, anticompetitive effects would not exist below the threshold and would occur more gradually above the critical level. To the extent that empirical studies have found any evidence of critical concentration levels, it tends to be of the latter type rather than the former.

Spotty evidence of critical concentration levels has been found in some non-healthcare industries. Some of the best information on this subject was identified by

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[54] Werden (1991, p. 10).

Weiss.[55] Indeed, in some cases when original researchers had not addressed the issue of critical concentration, he replicated their results using alternative concentration variables to test which one best explained price variation. In some of these studies, a functional form using the critical concentration ratio fit the data better than did alternatives.

Based on this research, Weiss concluded that "concentration makes little difference below CR4=50." This conclusion, however, is of little value for merger policy where the more difficult decisions are generally made at higher concentration levels. Additionally, this summary statement belies the variety of empirical results collected in the different industries. Where data were available for various industries, Weiss re-ran regressions using the HHI, various other concentration measures, and alternative critical concentration ratios as explanatory variables. The variety of results, even across similar products or in different years for the same products, is noteworthy.

For example, in cement, Weiss ran cross-section regressions separately for each of seven different years. He found that in two of the years the market structure variable that best explained variation in price was the share of the largest firm in the industry, but that a two-firm critical concentration ratio of 90 was preferred in two other years. In two other years, both the two-firm and the four-firm concentration ratios were equally significant. Strangely, in two of the years when critical concentration ratios provided the best fit, alternative specifications of the regression using the six-firm and five-firm concentration ratios, respectively, provided estimated coefficients that were negative and strongly significant.

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[55] Weiss (1989, pp. 272-283). For reasons described above, studies focusing on the effect of concentration on profit are less useful than those focusing on the effect on price. Some early studies addressing the critical concentration level relationship with profit are summarized by Pautler (1991 pp. 637-648).

Weiss performed a similar analysis in the airline industry and also got conflicting results. He concluded that for minimum unrestricted daytime fares, the HHI provides the best fit, but for average unrestricted daytime fares a three-firm critical concentration ratio of 93 yielded the best results.[56]

Weiss found similar contradictory results when he re-analyzed empirical studies in auctions, retail gasoline, rail freight rates, and banking.[57] Clearly these studies do not point to a critical concentration level, or any other market structure standard that should be applied uniformly across industries.

D. Hospital and Healthcare Studies

Because different industries are likely to remain competitive at different levels of concentration, studies analyzing the effect of concentration on competition in the hospital and healthcare industries may be the most relevant when considering policies for these same industries.

Of the many studies reviewed for this section (See Exhibit A), none found a critical concentration level for hospitals. Indeed, a major FTC Staff Report on competition among hospitals concluded, "In no case…does the magnitude of the Herfindahl coefficient suggest that market structure, as measured by a Herfindahl or concentration ratio, is a substantial determinant of price or expense."[58] When the author tested for a critical concentration level

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56 Ibid., 1989, p. 275.

57 Ibid., 1989, pp. 272-275.

58 Noether (1987).

where the HHI equals 3000, she found, "Once again concentration appears to have no significant net effect on prices.…The price coefficients suggest that prices are .7 to 1.1 percent higher (albeit insignificantly)…when the Herfindahl equals or exceeds .3 [i.e., 3000]." While this study does not provide support for any particular merger standard below an HHI of 3000, its results have to be interpreted with care because the data come from a period when there was little price competition among hospitals.

A more recent study of hospital concentration found some efficiency benefits from higher levels of concentration.[59] Specifically, Fournier and Mitchell examined the effects of concentration on costs for various hospital services. They used data for 179 short-term general-care hospitals in Florida for the years 1984-1986. Although their empirical findings were statistically weak, they found small decreases in hospital costs associated with increases in market concentration as measured by the HHI.

An event study by Woolley also identified some perceived advantages and disadvantages of hospital mergers.[60] He found some evidence that hospital mergers, "would be likely to increase hospital profits by allowing them to reduce costs, (due to reduced non-price competition or perhaps by increased efficiency), with prices falling to a lesser extent." He also says that, "it is still not clear what public policy should be

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[59] Fournier and Mitchell (1992). These authors apparently also conducted a 1992 study for the State of Florida Health Care Cost Containment Board, entitled, "Dimensions of Local Competition in Florida, 1984-1990." With some minor exceptions, in the Florida study the authors either found a statistically insignificant or a negative relationship between the HHI and price.

[60] Event studies look at the stock prices of merging companies and their competitors to determine the effects of key events on these stock prices. Since a company's stock value reflects the discounted stream of that firm's expected future profits, events that alter its anticipated profits will affect its stock price. Events studies of competition often focus on the stock price of non-merging competitors. Unlike the merging parties, the cost structures of their competitors are not affected by the merger. Consequently, according to the theory, a merger that harmed competition would help competitors and would raise their stock prices. Among the problems associated with such event studies is the difficulty of identifying what dates to use to measure the impact on stock prices.

towards hospital competition and mergers. Mergers may reduce competition, perhaps by facilitating collusion, but may also serve to increase efficiency by reducing overconsumption of both the quantity and quality of health care."[61] Doubt is cast on the implications of the Woolley results, however, by an important technical problem. Most hospitals compete in local markets. Yet if a hospital has publicly traded stock, which is necessary for an event study, it is probably part of a chain of hospitals. Under these circumstances, local competitive effects are likely to be a small component in the overall variation of stock prices. The implications of this study are further weakened because the data are from a period where there was arguably little price competition among hospitals.

A recent paper by Wholey, Feldman, and Christianson examines the effect of market structure on HMO premiums.[62] They used data for all HMOs operating in the United States from 1998-1991. These authors find that the greater the number of HMOs in a region, the lower are the HMO premiums. This effect, however, was found to be different for IPA-HMOs than for staff model HMOs.[63] Moreover, the impact of concentration for IPA-HMOs occurs only at very low levels of concentration. That is, premiums are the lowest when there are very large numbers of IPAs, but after an initial reduction in the numbers (when the number of IPAs is reduced from the fourth quartile to either the first, second, or third quartile), there is essentially no relationship between the number of IPAs and premiums.

This result is puzzling. The dividing line between the third and fourth quartiles in

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61 Ibid., p. 285.

62 Wholey et al. (1995).

63 These results are difficult to interpret. It is generally believed, and recent agency enforcement behavior appears to support, that IPAs and staff model HMOs are in the same antitrust market.

this database is about 13 IPAs. Very few markets have this many IPAs, let alone the 17 that would presumably be the upper bound of the fourth quartile. Nonetheless, it is surprising to have a study indicate that the competitive problem occurs when the number of IPAs drops below such a high threshold—13—and not find a price effect when the number of IPAs drops to lower numbers.

A study by Melnick, Zwanziger, Bamezai and Pattison also addressed the issue of concentration/price relationships for hospitals.[64] Using data for 190 hospitals, the authors regressed the prices paid by the Blue Cross of California PPO on dummy variables covering three different HHI ranges, and variables that controlled for provider characteristics, market position, and payor mix.[65] Although this study found a relatively weak relationship between concentration and prices (a merger from three to two hospitals, raising the HHI by 1667 points to 5000 increased prices nine percent), its methodology is fundamentally flawed. The HHIs used in this study are meaningless because each hospital was assigned a separate HHI calculated for its service area, not an antitrust market. That is, different hospitals competing in the same market were assigned different HHIs. From an antitrust perspective, this concept is meaningless because coordinated behavior arguably depends on the concentration level in the market, which should be the same for all firms in that market. Moreover, there is no reason to expect service areas to approximate actual antitrust markets. An antitrust market must include all hospitals that would need to be

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64 Melnick et al. (1992).

65 Provider characteristics include teaching status, relative costliness, and provider ownership, (i.e., not-for-profit, investor-owned, or government). The market position variables include the Blue Cross share of the hospital's inpatient days, the hospital's share of all Blue Cross days within its market, the hospital's share of all Blue Cross days within the county, and the hospital's occupancy rate. The payor mix variables show the percent of Medicare discharges and the percent of MediCal discharges.

included in a successful cartel.[66] In effect, the use of firm-specific HHIs illustrates the market definition problems in this study.

Even abstracting from these problems, the authors still did not call for broad policies to be based on their conclusions. They caution that, "This study is highly specific. Before findings can be generalized they must be replicated for different payors in different areas under different time periods."[67]

E. Summary of Empirical Studies

Various methods have been used to estimate the effect of market concentration on the level of competition in an industry. Even the conceptually most appropriate studies, which look at the effect of concentration on price, have shortcomings that may be sufficiently serious that their results do not provide a reliable basis for specific policy standards.

Although there are numerous exceptions, many of the studies show only a small positive relationship between market concentration and price.[68] These studies, moreover, do not show a unique relationship that holds across studies, much less across industries. Consequently, the empirical economic literature provides no basis for the existence of a unique critical concentration level or for a specific critical HHI level of 1800. Indeed, the variation among the empirical results suggests that non-concentration factors are likely to

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66 In a densely populated area, for example, where hospital A's service area significantly overlaps with that of hospital B, and hospital B's service area significantly overlaps with that of hospital C, hospitals A and C could be in the same antitrust market even though their service areas do not overlap.

67 Melnick, et al., p. 232.

68 See the summary table in Weiss (1989, pp. 223-236).

be a more important determinant of a market's competitiveness then is the concentration level. In particular, the empirical studies of hospital markets provides no basis for employing concentration as the primary determinant of hospital performance or for establishing a critical concentration level for enforcement.

V. Efficiency Considerations in Merger Enforcement

Mergers generally create cost savings or efficiencies. These efficiencies are another factor mitigating against the employment of strict market concentration standards in merger analysis. The effects of efficiencies on merger policy can be categorized into two groups, static and dynamic, which are explained below.

Ever since Williamson's articles on the role of efficiency analysis, economists have recognized the crucial role of efficiency analysis in a broad-based merger policy.[69] Williamson's insight is that even relatively small efficiency gains resulting from a merger can be sufficient to offset concerns about market power. That insight has been confirmed and extended by Muris, Bumpass, and Weiss.[70]

The 1992 Merger Guidelines state explicitly that the Agencies will take efficiencies into account:

> Some mergers that the Agency otherwise might challenge may be reasonably necessary to achieve significant net efficiencies. Cognizable efficiencies include, but are not limited to, achieving economies of scale, better integration of production facilities, plant specialization, lower transportation costs, and similar efficiencies relating to specific manufacturing, servicing, or distribution operations of the merging firms. The Agency may also consider claimed efficiencies resulting from reductions in general selling, administrative, and overhead expenses, or that otherwise do not relate to specific manufacturing, servicing, or distribution

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69 Williamson (1977).

70 Muris (1980), Bumpass (1987), and A. Weiss (1992).

> operations of the merging firms, although, as a practical matter, these types of efficiencies may be difficult to demonstrate. In addition, the Agency will reject claims of efficiencies if equivalent or comparable savings can reasonably be achieved by the parties through other means.

It has been argued that efficiencies cannot be analyzed within the context of merger analysis and that the safe harbors of the Guidelines should be set high enough so that efficiency claims can be discounted when compared to the likely anticompetitive consequences of a merger.[71] That is, efficiency claims are perceived to be too speculative and complicated to be analyzed on a case-by-case basis because efficiencies necessarily will only be realized in the future and only in the context of a new organizational structure. Of course, similar arguments could be made about the competitive impact of mergers. Any reduction in competition will necessarily only occur in the future in a market with a different structure.[72] An argument to discount efficiency claims, whether or not it is correct, ultimately begs the issues of whether such discounting implies the use of some critical concentration level and whether the (efficiency-discounted) critical concentration level should be the same for all industries.[73]

Efficiencies created by mergers also may have an independent impact on a market's competitiveness. One factor influencing the ability of firms to collude is their relative costs. All else equal, the greater the variation among the costs of firms in a market, the

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71 Fisher and Lande (1989).

72 In fact, the ability to predict cost savings may be greater than the ability to predict competitive effects. Cost savings resulting from a merger will occur within the facilities of the merging parties. In principle, the post-merger realignment of production facilities can be specified with precision. By contrast, a prediction about competitive effects necessarily requires consideration of how unrelated firms will each balance conflicting group and firm goals and how a relatively small change in market structure will affect this balancing. Overall, it would appear that efficiency claims would often be less speculative than would be the competitive analysis.

73 Williamson and Muris both argue that efficiency considerations are possible and appropriate in the context of merger analysis. They, along with Kwoka and Warren-Boulton, make several specific and operational suggestions on what sort of information might be helpful in considering efficiencies. See Kwoka and Warren-Boulton (1986).

more difficult it is for them to collude successfully. To the extent that the post-merger firms will have lower costs than they had pre-merger, collusion may be made more difficult. For any given price level, a competitor with lower costs has a greater incentive to ignore group goals and to pursue its independent goals, since its lower costs increase the profits it earns from each additional sale.

Exhibit A
Theoretical Literature Reviewed

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