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KEY ECONOMIC ISSUES IN NETWORK MERGER ANALYSIS

Network industries such as telecommunications and automatic teller machine systems have undergone dramatic consolidation and restructuring in the past five years and are likely to receive increased antitrust scrutiny in the future. The prime motivating factors for the effusion of vertical and horizontal mergers, joint ventures, and licensing arrangements in these industries are the significant economies of scale and scope as well as the network externalities that are characteristic of network industries. Because of these characteristics, consolidation or joint ventures in network industries can have greater potential efficiencies than in non-network industries. These network features, in turn, can account for the tendency of many network industries to be characterized by relatively few market participants. Consequently, a far greater proportion of network industry mergers are likely to receive antitrust scrutiny than in most other industries.

The feature common to all network industries is the linkage of multiple points into a single system, where the linkage, either individually or collectively, can involve some degree of network externalities. Network externalities occur when the addition of more points to the network makes the network more valuable to its customers. This is especially common in electronic networks like shared ATM systems. ATM networks link together multiple banks' ATMs via a central switch, allowing customers to access their accounts at any ATM in the system. Network externalities also distinguish a true network industry from an arrangement such as a manufacturer-distributor system (which may be referred to as a network). Two other types of networks are "product system" networks such as computers and networks that involve physical connections such as pipelines and railroads. Physical networks tend to have smaller network externalities, but more pronounced scale or scope economies.

The economic analysis of network mergers follows the same principles as in other industries. Market definition and identification of alternative suppliers can, however, be especially complicated in network industries experiencing rapid technological change, such as the telecommunications and computer industries. Newly emerging technologies could provide substantial competition to existing technologies, thereby increasing substantially the number of firms providing products competitive with those of the merging companies. Correct identification of the relative costs of technologies and the extent to which their products are substitutes can be very difficult when technologies are emerging at a rapid rate, but have yet to be relied upon significantly by customers. Similarly, in a merger among providers using different technologies it can be difficult to determine whether competition is actually reduced by the merger. Technological change has the capacity to change not just the products that are capable of substituting for those of the merging firms, but also the scope of the geographic market.

Another aspect of network mergers that complicates the antitrust analysis is the prevalence of cost structures that lead to relatively few firms in the market. In some network industries, economies of

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scale are so substantial that the lowest cost means of providing a product to meet market demand could be a single firm (a natural monopoly). If one party to a merger is a regulated natural monopolist, there may be concerns about the exercise of market power in otherwise competitive markets. The analysis of the merger of two providers with substantial economies of scale should consider factors such as whether the providers are well-established incumbents that are operating in multiple markets or whether one is a new, smaller provider. In addition, the analysis should consider the relative merits of competition as an inducement to efficient production versus regulation as a means to enforce outcomes comparable to competitive markets. Moreover, it is important to evaluate whether there are new technologies that are alternatives to the natural monopoly technology used by the merging parties.

The combination of substantial scale and scope economies, a tendency toward few market participants, and the prevalence of rapid technological change indicate that network mergers will tend to raise the prospect of both substantial efficiencies and antitrust concerns. While these factors suggest that certain of the economic principles that underlie all merger analysis will require greater attention, both in theory and in development of the relevant facts, they also demonstrate that understanding the framework and the facts of a specific industry and merger are the critical aspects of sound merger analysis in network industries.

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FTC REGULATION OF FOOD ADVERTISING

The food market is about to witness a remarkable but unheralded clash between the Food and Drug Administration (FDA), which regulates food labels, and the Federal Trade Commission (FTC), which regulates food advertising. The dispute is about how to regulate advertising, and the consequences will be important for consumer nutrition and health. Underlying the dispute are differences in how advertising and labeling communicate information to consumers in a competitive market.

Recently, the FDA implemented an elaborate set of labeling requirements for most of the food industry. Labels must list the amounts of various ingredients and show how those amounts compare with benchmarks called "Daily Reference Value" (roughly equivalent to the old "Recommended Daily Amounts"). Only specified ingredients can be described, and then only in terms of a few narrowly defined words such as "high," "low" or "reduced." There are also tight restrictions on health claims about birth defects and chronic diseases such as cancer, heart disease, and osteoporosis.

In May, the FTC issued an enforcement policy statement indicating that in regulating food advertising, it intends to follow FDA rules where possible. The statement also suggests the FTC would prefer to follow *all* FDA rules. It cannot do so, however, for the simple reason that the FTC is limited to prosecuting claims that are deceptive, and the FDA rules make no pretense to applying only to deceptive statements. Proposed legislation would require the FTC's regulation of advertising to follow FDA rules for labeling regardless of whether ads are deceptive. This legislation is not expected to pass, but the issue of FDA rules in FTC regulation will undoubtedly continue to attract political attention.

There are compelling reasons to believe that public health would suffer if the FTC were to mold its advertising policy around the FDA's labeling rules. For one thing, the FDA rules are simply too strict. Ingredients can be described on labels only if they are on a list approved by the FDA, which does not include some widely advocated ingredients such as complex carbohydrates. Comparative statements such as "50% less saturated fat" are so tightly constrained that a manufacturer usually cannot describe a reduced fat version of its own brand. Only with great difficulty can a manufacturer emphasize that its brand is superior to another by having, for example, more fiber, less fat or less sodium. Simple factual statements like "high in complex carbohydrates" or "no cholesterol" are prohibited or hemmed in by disclosure require-

ments. New health claims require a lengthy petition process and must be based on a very stringent research standard.

The most important reason for not expanding FDA labeling policy to encompass advertising is that advertising is fundamentally different from labeling. Advertising is constructed differently from labels, serves different purposes, is used by consumers differently, and tends to reach different consumers (nonbuyers and the less educated, for example). Labels can purport to some degree of completeness; advertising can never do so. Most important, advertising is a superior competitive tool for bringing new information to the market and for exploiting the advantages of new or improved products. These differences between labeling and advertising account for much tension between the FDA and traditional FTC approaches.

The stringency of the FDA rules is illustrated by research findings about the effects of trans-fatty acids (found in margarine and other foods) on blood cholesterol, and therefore presumably on heart disease. A widely publicized report in the *American Journal of Public Health* recently concluded that trans-fatty acids cause more harm than the ordinary animal fats they replace. The immediate problem is that the new FDA rules make it impossible for the market to respond to this development by putting new information on labels. It is illegal for labels to mention the possible connections between trans-fatty acids and heart disease. It is illegal for labels to state that a product contains a natural fat rather than trans-fatty acids, or to state that a product "contains less" or is "reduced in" trans-fatty acids. This information need not be lost to consumers, however, if the FTC does not depart from its traditional standards in order to accomodate the FDA labeling rules.

These circumstances raise basic questions about the role of advertising and commercial speech. Advertising is a safety valve in markets threatened by heavy-handed regulation of information. There is every reason to believe that vigorous advertising on topics such as trans-fatty acids and complex carbohydrates will improve the market and benefit consumers. This supposition is reflected in current FTC policy. Through its long tradition of avoiding pre-clearance of claims, attacking artificially imposed restraints on competitive advertising, and examining how advertising claims work in the marketplace rather than on paper, the FTC has permitted an immense amount of valuable information to reach consumers through competitive markets. This has contributed to improvements in products, markets, and consumer awareness, including lower prices and an enhanced role for nutrition in food choices. The proper focus in advertising regulation is on the competitive process and its inevitable consumer benefits. The FDA's labeling policies threaten to halt such processes, and the FTC should not be a party to such an error.

John E. Calfee, Special Consultant to EI, is an Adjunct Scholar at the American Enterprise Institute, where he is writing a monograph on health information in advertising. This article is an expanded version of an op-ed piece in the WALL STREET JOURNAL *on September 12, 1994.*

DISCOUNTING CASH OUTFLOWS OF ENVIRONMENTAL REMEDIATION

Claims for environmental damages often involve an estimate of the value today of future corrective action costs. Estimates of such costs can be highly uncertain, and the cost stream can extend for years into the future. This raises the issue of how to calculate the present value of risky future cash outflows. For those accustomed to discounting risky future cash inflows, the answer may seem obvious. Risky investments are typically discounted with a risk-adjusted discount rate that is higher than the risk-free rate. This is wrong for risky negative cash flows, however, such as the costs associated with corrective action.

When calculating what future cash flows (positive or negative) are worth today, two adjustments must be made; one to account for the time value of money, and one to account for uncertainty in the cash flows. The time adjustment reflects the fact that a dollar today is worth more than a dollar a year from now, even when the future dollar is absolutely certain. The certainty adjustment is also important; the less certain one is to receive a dollar, the less one is willing to pay for it.

When converting future uncertain cash flows to present values, analysts usually adjust for both time

and uncertainty in a single step with a risk-adjusted discount rate. The risk-adjusted rate is higher than the risk-free rate when investors demand a higher expected return for accepting the risk associated with uncertain future payoffs. Equivalently, the adjustments for time and uncertainty can be made separately by converting the cash flow from an expected value to a "certainty equivalent" and then discounting that at a risk-free rate.

For illustration, consider two alternative investment opportunities: one would return $1,000 for certain in one year, and the other has a 50 percent chance of paying off $1,500 and a 50 percent chance of paying off $500 in one year. The expected value of these two cash flows is the same ($1,000), but a risk-averse investor would prefer the certain payoff, and would be willing to pay more for it. Suppose that the investor would be willing to pay $100 to eliminate the uncertainty, so that he would be indifferent between an uncertain payoff with an expected value of $1,000 and a certain payoff of $900. The $900 is the certainty equivalent of the risky cash flow. Using a risk-free discount rate of 5 percent, the present value of this investment opportunity is $857, implying a risk-adjusted discount rate of 16.7 percent.

Now consider a risk-averse party who faces *negative* cash flows one period hence; these cash flows are not returns on an investment, but costs such as environmental remediation expenses to be paid out in the future. If there is a 50 percent chance that the costs will be $500 and a 50 percent chance that the costs will be $1,500, the expected value is $1,000. The risk-averse party is willing to pay a premium to avoid uncertainty. With a premium of $100 to avoid the uncertainty, the certainty equivalent of that cash flow would be $1,100. Discounting the certainty equivalent of $1,100 at the risk-free rate yields a present value of $1,048, which implies a risk-adjusted discount rate of -4.6 percent.

A negative discount rate may be counterintuitive, but in this case it is correct. A risk-adjusted discount rate is a shorthand method for making two distinct adjustments to cash flows: one for time and another for risk. Most individuals are accustomed to discounting positive cash flows, which requires increasing the discount rate to reflect risk. A risk-adjusted rate that is higher than the risk-free rate always serves to move the present value of a future cash flow closer to zero. This is correct for positive future cash flows, but not for negative cash flows. Increasing the discount rate to adjust for uncertainties in negative cash flows results in a higher present value (a lower present value *cost*) than would be derived using a risk-free rate. This is clearly wrong; it implies that the greater the risk a responsible party must bear, the less it should be compensated. The adjustment for risk should serve to reduce the future value of cash flows, whether they are positive or negative. For negative cash flows, this would imply a risk-adjusted discount rate that is less than the risk-free rate, and perhaps, even less than zero.

For negative cash flows, a risk-adjusted discount rate will be less than the risk-free rate and may even be negative.

Environmental remediation often involves uncertain future cash outflows. Calculating the present value of such negative cash flows can require the use of a negative risk-adjusted discount rate, which can be counterintuitive. Use of the certainty equivalent and a risk-free rate in a two-step process is a more transparent and intuitively appealing approach for calculating the present value of negative cash flows.

EI Director of Environmental Analysis Susan E. Dudley has been involved in several recent cases that required discounting future environmental costs. A more detailed treatment of this topic is forthcoming in the Environmental Claims Journal.