

1 Introduction

Mergers between firms in oligopoly industries often inspire intense debate between economists, newspaper reporters, government officials, and consumers. A merger will generally imply transfers of large sums of money, as well as causing important changes in capital and labor markets. Naturally, there will also be significant effects on the production of goods and services, and their prices. Each of these effects implies changes in the welfare of many consumers, workers, investors, producers of substitute and complementary goods, and the treasury department. In principle, a merger should be judged to be “socially favorable” if the aggregate effect on social welfare is positive, and “socially un-favorable” otherwise. However, social welfare, and changes in social welfare, are impossible to calculate, or at best, require significant value judgements as to which members of society should weigh more heavily in the social welfare calculation. Consequently, decisions regarding mergers made on behalf of a society often inspire heated debate.

In all developed economies, there exist antitrust commissions that pass judgement upon the social favorability of proposed mergers. For example, in the United States, the Department of Justice evaluates proposed mergers according to their anticipated effects upon competition and the creation of monopoly power. The basic guidelines upon which the final decisions are based are contained in a document that was first published in 1982, and then revised in 1984 and again in 1992 (see Salop (1987), White

(1987), Fisher (1987) and Schmalensee (1987) for a discussion of this document). Aside from considerations regarding the contestability of the market, the guidelines are heavily dependent upon the anticipated effects of a merger on the Herfindahl-Hirshman index (here-in-after denoted by H). For example, a merger that leaves the market with a value of H below 1,000 should not be opposed, while a merger that leaves the market with a value of H that is greater than 1,800 should always be opposed. If the merger leaves the market with a value of H between 1,000 and 1,800, it will only be opposed if it causes H to increase by more than 100 points. However, in general, it is impossible to express social welfare as a monotone function of H , and so guidelines that are based strictly on H may well lead to socially favorable mergers meeting with strong opposition, or socially un-favorable mergers to be passed.

In contrast to guidelines based on the measure H , economists tend to evaluate the social effects of mergers by how they affect social welfare, or the sum of consumer and producer surplus, which we will denote by M . Given a market demand curve, M can be calculated once a model of how the firms that are active in the market compete has been established. Naturally, models based on different assumptions as to how the market operates will generally give different values for M , because they give different values of total production and of how this total production is distributed among the firms.

One of the most curious aspects of the use of the H index in practically all of the

antitrust debates concerning mergers is the absolutely naive manner in which it is used. The usual approach used by competition authorities consists in calculating the value of H before the merger, and then recalculating it after the merger assuming that the share of the merged entity equals the addition of the shares of the pre-existing firms, and that the shares of all other firms (those that do not participate in the merger) remain constant. This is obviously a severe abstraction from all reality, as any model of competition clearly reveals - a merger will necessarily affect the final market shares of all firms. It is very simple to show that the naive method always results in an increase in the value of H after a merger. However, being more realistic, one should contrast the pre-merger and the post-merger situations in terms of the equilibrium market shares in each case, which requires the application of an economic model of industrial competition. The result is that, in reality it is not true that a merger will always increase the value of H . In this paper we use a model of quantity competition known as the “extended Stackelberg model”. In this model, there exist a hierarchy of levels of firms, leading to many different sizes of firms (as measured by their output) and hence many different market shares. Any given firm at any given level acts as a Stackelberg leader with respect to all firms at lower levels, and as Stackelberg followers with respect to all firms at the same level or greater. As simple special cases, the extended Stackelberg model admits all traditional quantity competition models, and so it can be seen to be quite general, covering an enormous