

statements about the need to tailor industrial policy to each state's individual capabilities. One solution, which I advocate with my coauthors (Aghion et al. 2012), is to ensure that all industrial policies are conducted in a highly competitive environment. The book is agnostic and sometimes contradictory on the need to combine industrial policy with competition, which it shouldn't be. India's industrial policies and the License Raj would have been much more effective if internal competition had been encouraged. Nevertheless, the book is engaging and refreshing in its perspective. All too frequently, collected volumes put together a disparate set of viewpoints, which leave the reader bewildered. In this volume, the authors speak with nearly one voice. While not everyone will agree with this book, it presents a viewpoint which has resonated in East Asia. For that reason alone, readers should take note.

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The Economics of Collusion: Cartels and Bidding Rings. By Robert C. Marshall and Leslie M. Marx. Cambridge and London: MIT Press, 2012. Pp. xii, 302. \$35.00. ISBN 978-0-262-01732-9. JEL 2012-0682

The Economics of Collusion is a compact treatise that examines cooperative behavior among supposed free-market competitors.¹ Robert Marshall and Leslie Marx (not Alfred and Karl) synthesize recent research on cartels and

collusion in a style that generally is accessible to human beings (vis-à-vis professional economists). The mathematics is limited and examples are numerous, although most references to the literature are, curiously, limited to recent decades. There was serious study of cartels before the 1980s that uncovered many essential insights still used today.

The volume benefits enormously from the authors' experience working on antitrust matters. It would be richer if it incorporated tales from more of the classic price-fixing cases. For example, I would think it is difficult to write a book about collusion in the manufacturing sector (Marshall and Marx focus on homogeneous manufactured intermediate goods) without mentioning the very first federally prosecuted cartel, Jellico Mountain Coal (1891), or the Great Electrical Conspiracy of the 1950s, in which Westinghouse, General Electric, Allis-Chalmers, and several dozen other sellers of large-scale electrical equipment to public utilities were convicted of price fixing. (Lean, Ogur, and Rogers 1982.) Their agreements were varied, involving identical bids, pricing formulas for complicated products, and even a "phases of the moon" system used to allocate the low-bid for high voltage switchgear. The bidding ring eventually was brought to the attention of federal antitrust authorities by a purchasing agent who noticed patterns in the bids. Federal prosecution in 1960–61 led to the incarceration of seven executives, the first time price fixers found themselves staring out at the world through vertical bars rather than off the country club veranda. The story fits into Marshall and Marx's book well, offering numerous examples supporting their theses, and for several decades was *the* big collusion story.

The authors highlight a helpful subtle distinction between a cartel comprised of all firms in an industry and a single-firm monopoly, which superficially may appear to be quite similar. While a monopoly is transparently a single seller with market power, a successful cartel is clandestine, promoting the appearance of a competitive industry, thereby inducing suppliers or customers that deal with it to relax their guard and possibly dispense with strategies to diminish or combat the economic power of the invisible monopolist or monopsonist. Moreover, a clandestine cartel

¹This review was prepared while the author was a Visiting Scholar at the University of South Australia.

consisting of firms that each has less than a 50 percent market share may be tempted to engage in dominant firm behavior that might otherwise be construed by antitrust prosecutors as an abuse of power by a single firm with a dominant market share, for example, pricing below average variable cost with the intent to drive noncartel rivals out of the industry.

The Economics of Collusion focuses on the coordination and control challenges confronting cartels. How do members of a cartel or bidding ring reach agreement, decide how to share the spoils of their crime (cartels are a per se violation of the Sherman Act, Section I, which carries criminal penalties), monitor compliance with the agreement (since legal channels, such as civil lawsuits against conspirators that defect from the terms of the agreement are not available), create incentives for compliance, and minimize the profitability of cheating on the agreement? Minimizing incentives to defect is a considerable challenge when a cartel elevates the price of sales or reduces the price of purchases because it creates a situation where a small deviation from the agreed (elevated or depressed, respectively) price can offer considerable enticement to a firm willing to risk cheating on the agreement. After all, the participants in a cartel have already demonstrated their low regard for ethics as well as legal niceties. Monitoring, communication, and transfers of revenue are the keys to a successful cartel. Observing monitoring, communications, and transfer activities can facilitate enforcement of prohibitions against explicit cartels.

In a detailed description of the worldwide vitamins price fixing cartels of the 1990s, Marshall and Marx argue that cartels are more effective, and therefore more likely to occur, with three or more sellers in an industry than with only two sellers. With only two sellers, each may recognize its self-interest in tacit cooperation sufficiently to make explicit (and illegal) collusion unnecessary. It is preferable to avoid the risk of prosecution for explicit collusion if opportunities for tacit agreements are available. As evidence supporting this proposition, Marshall and Marx observe that once the vitamins cartels were exposed and prosecuted, the prices of particular vitamins produced and sold by three or more former cartel members fell 25 to 30 percent, back to precartel

levels, while the prices of vitamins sold by duopolists remained largely at the level they had maintained while the cartel operated. At the other end of the spectrum, cartels consisting of a dozen or more sellers are less likely to be successful because of the greater likelihood that some participants will defect from the agreement in anticipation that such lack of honor among thieves will not be detected by their partners in crime.

There is a brief description of the economic rationale for the illegality of explicit cartels. It describes the social welfare loss of foregone surplus, and explains that consumers' or suppliers' resources devoted to combating price fixing constitute social welfare loss. It does not incorporate, however, the more general rent-seeking literature that has been the basis for Chicago economists' persistent opposition to price fixing, even as one of their tribe (McGee 1960) argued vehemently that, if left alone, eventually all price fixing cartels dissolve either by internal defection, entry that provokes competition, or through technological obsolescence. Before most cartels disintegrate, however, goes the Chicago argument, rents that appear to be mere transfers from customers or suppliers to the cartel are transformed into real social welfare losses as the cartel tries to fortify its position and prevent entry, and potential entrants attracted by cartel profits expend resources to circumvent those impediments to entry (Posner 1976, chapter 1).

Marshall and Marx make only passing reference to the likelihood of nonprice competition raising the costs of cartel members who are unable to anticipate a priori all possible avenues of competition, such as occurred in the airline industry in the 1960s and 1970s, when price-fixing of air fares was legal under the Civil Aeronautics Act. While there was a lot of fuss about the great "sandwich wars" (imagine a lobster tail between two pieces of bread) used to attract customers from rival airlines, the primary result was excessive flight frequency, leading to lower than efficient load factors (the ratio of passengers to seats), and much higher costs and prices than passengers would have preferred to pay to fly on more crowded aircraft (Douglas and Miller 1974). The volume also could benefit from a discussion of the economic costs of a cartel with free entry, which attains equilibrium under conditions similar to

the Chamberlain model of monopolistic competition, with excess profits competed to zero by successive entry, but at a higher average total cost than would have evolved in the absence of the cartel.

Marshall and Marx describe how entry into a cartelized industry can be deterred by limiting price elevation to a level that generates profits just insufficient to attract new firms to the industry. Of course, taking less than full advantage of a cartel situation may also be an optimal strategy to avoid antitrust prosecution, as was modeled and tested empirically by Block, Nold, and Sidak in 1981, and tested more recently by Feinberg in 2006. Implemented in reverse, antitrust enforcement can be used by prosecutors to foster limit pricing, thereby reducing the deadweight loss due to cartels or bidding rings that are not detected or prosecuted.

Thirty-five years ago, Asch and Seneca (1976) tried to estimate the extent of excess profitability spawned by cartels. To their surprise, they found that industries populated with known cartels earned lower profits than those where there was no evidence of cartels. At that point, they realized they had the correlation right, but the causation wrong. When they reversed their equations and tried to explain the appearance of cartels, they found that, in addition to the usual structural characteristics like fewness of firms, barriers to entry, and inelastic demand, an important catalyst of cartel formation is the economic vitality of the industry. It is industries experiencing a decline in demand and excess productive capacity that are subject to intense price wars that breed cartels, often as a last ditch effort to preserve profitability in an industry headed for extinction, or at least for a major shakeout. Poor economic conditions would be an additional “plus factor” for identifying situations conducive to price-fixing.

Chapter 4 concerns ways collusion can be inferred from economic evidence. This is a challenging task, because much economic evidence is consistent with competition as well as collusion. For example, the standard model of perfect competition leads to identical prices, as does a cartel. Models of both competition and cartels predict similarly frequent increases in prices if input prices rise (albeit smaller increases by monopolists than by firms in perfect competition). An

obvious possibility the authors describe extensively is to estimate prices based on input prices and quantities in another market that everyone agrees is competitive, and then compare actual prices to predicted prices for the market under suspicion. Unfortunately, this approach cannot be used when there is a single relevant market. The pattern of market shares over time and the frequency of price change announcements can also be useful in targeting situations to investigate.

Another useful insight explored at length in the volume is the need of cartels, and especially bidding rings, to make interfirm transfers either as a “true up” to bring actual sales in alignment with agreed market shares in a price-fixing cartel, or as payment from the highest bidder in a postauction secondary “knock out” ascending bid auction to the other participants in the conspiracy. Marshall and Marx describe various methods of implementing such transfers, including interfirm purchases of product at nonmarket prices, product swaps, sham litigation, and patents. This is an approach that is probably underutilized in terms of pinpointing industries worthy of investigation.

A good portion of chapter 6, on the implementation of collusion by cartels, relies on Stigler’s 1964 article, “A Theory of Oligopoly,” which was cited as one of his signal contributions when he won the Nobel Prize for Economics. Marshall and Marx draw heavily on Stigler to analyze the role of market shares and price discrimination in successful cartel operations. However, they do not emphasize what I have always considered the most important insight from Stigler’s classic contribution, namely that the likelihood of a conspirator attributing a decrease in its sales to deviant behavior by a coconspirator is inversely related to the number of firms in the cartel. As the number of participants declines, the effect of a defection by one on the (diminishing) sales of any other conspirator rises, thereby increasing the chance that it will be detected, interpreted as cheating, and met with retaliation, thereby undermining the stability of the cartel and the prospect of long-run excess profits. Understanding this likely scenario, participants in cartels consisting of fewer firms will resist the temptation to cheat because they anticipate such opportunism to be unprofitable. Consequently, the cartel is more likely to be stable and profitable over time. Indeed, the

ubiquitous Herfindahl–Hirschman Index of market concentration can be derived directly from Stigler’s “cheating detection model.”

Chapter 9 explores the implementation of collusion by bidding rings. Marshall and Marx contend that “rings suppress competitive bidding in an attempt to lower auction prices . . . There is no typical analogue to price discrimination or quantity restrictions within the narrow scope of a ring’s business.” If this is true, why do antitrust authorities care about bidding rings? Absent price discrimination, which can enhance or diminish efficiency, depending on the type of discrimination and circumstances, or a reduction of output that is valued above its cost by consumers, where is the welfare loss? If output is not affected, a bidding ring just redistributes wealth between sellers and buyers and, a priori, there is no basis on which to judge whether the allocation of wealth to sellers or buyers is more “just.” Something seems to be missing here.

If I were still teaching a graduate Industrial Organization course, I would include most of this book on the reading list. I would supplement it with the sections from Blair and Kaserman (2009) on the welfare costs of cartels, and would assign the (admittedly now quite old) articles by Hay and Kelley (1974), and Fraas and Greer (1977), about the structural and institutional characteristics that seem to distinguish industries susceptible to conspiracy from others. Both of these articles provide considerable systematic cross-section empirical evidence that is consistent with the conclusions reached by Marshall and Marx from less comprehensive data, such as the role of market concentration and trade associations in facilitating and solidifying conspiracies. But *The Economics of Collusion* would be the centerpiece of the assignments on this topic. It is also must reading for attorneys either prosecuting or defending cartels, as well as economists trying to identify a role for themselves in an area that historically has been more the purview of private detectives looking for a hot document signed in blood or prosecutors trying to persuade a whistleblower to testify against his former coconspirators in return for immunity or at least a reduced sentence. The book inserts economics into an area of competition policy where it has played a relatively minor role until the past two decades.

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This volume aims at nothing less than promoting consideration of business ethics pan-disciplinarily and in a wider range of business-school