

have been alerted to the fact that relative price increases alone could not have assured increased employment in service industries. Better they had tried to disabuse the minds of those who think a rising share of manufacturing output and employment is the only true sign of national economic strength than to have engaged in the kind of data manipulation and interpretation conducted in the book. Similarly, recognition of the role of growing demand could have prevented the authors from making the unbelievable assertion that natural resources with fixed quantities could be supplied in perpetuity.

Documenting the shift in policy regime in the U.S. between 1960 and 1980 towards higher government spending, increased taxation, and greater economic regulation in association with the economic productivity slowdown also might have been a more helpful research effort. The qualifications the authors note regarding the French and Japanese models of public sector direction of private enterprise would also have fitted well with this approach. They could have warned those calling for a government-led re-industrialization plan in the U.S. that public sector agencies are not good at picking winners, and that the Japanese MITI (Ministry of International Trade and Industry) is reported to have discouraged Honda from investing in automobiles and Sony from going into electronics!

However, the book has some fine points. It is written in readable style, even if frequent switches of emphasis or qualifications of argument appear confusing. For example, it is not really clear from the discussion (pp. 239–240) whether welfare productivity is easy to measure. Also, it is hard to know what to make of culture or race as a factor in economic development from the discussion (pp. 177–180), even as culture is invoked to “explain why every brilliant economic success in the post-war era has occurred in the Far East [and] almost every example of a profoundly disappointing economic performance has occurred in Latin America” (p. 177). What explains the much poorer performance in most African economies? Anyhow, I find the culture argument quite uninformative.

Putting the numerous mathematical proofs and derivations in the appendixes is also a plus: few readers would have the time and patience to go

through mathematical exercises that do not appear to advance understanding of the real issues at stake. The attempted proof of “perpetual increases in the effective inventory” of non-renewable resources (pp. 357–358) is a good example. Finally, the authors may be credited with having assembled relevant data and references to other studies which may help further examination of the sources and solutions to economic productivity slowdown in the U.S. before the early 1980s.

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Lee G. Cooper and Masao Nakanishi, *Market Share Analysis*. Boston, Dordrecht, London: Kluwer Academic Publishers, 1989. ISBN 0-89838-278-5.

Cooper and Nakanishi provide a valuable guide to the analysis of market shares of competing products. As they emphasize, the advent of optical scanning systems (the ubiquitous bar codes) for sales and inventory control has made available a wealth of data for packaged consumer goods. Data needed for store-level analyses are routinely available to retailers, and consumer-panel data are collected by several market-research firms. Although attention is directed towards branded, packaged consumer products, the methods described can be extended to other products as well.

The book appears to be directed primarily to two audiences: management scientists and others who develop tools for business management, and brand managers and other business decision makers. The authors make a commendable effort to clearly explain the analytic tools they propose, but I fear that some of the elements (e.g., principal components) are sufficiently subtle that few brand managers or business-school students will have the background to fully understand the tools. Thanks to the careful exposition, the book should be readily accessible to graduate students with statistical or econometric backgrounds; the comprehensive citations to previous literature will assist those who wish to delve more deeply into the methodology.

The key starting point in analysis of market shares is that the share one brand commands

depends on the interaction between pricing and promotion strategies of all competing brands. In order to properly analyze market shares, Cooper and Nakanishi rely on a general *attraction* model where the market share of the  $i$ th product,  $s_i$ , is proportional to the ratio of the  $i$ th product's attractiveness to the total attractiveness,  $A_i$ , of all products in the market:

$$s_i = \frac{A_i}{\sum_{j=1}^m A_j}.$$

Attractiveness is not defined except by the model; it depends on price, advertising, coupon distribution, and other marketing characteristics of product  $i$ , and potentially on the marketing characteristics of all competing products as well. In the most general formulation presented,

$$A_i = \exp(\alpha_i + \varepsilon_i) \prod_{k=1}^K \prod_{j=1}^m f_k(x_{kj})^{\beta_{kj}}, \quad (1)$$

where  $x_{kj}$  refers to the  $k$ th market characteristic (e.g., price, coupon distribution) for the  $j$ th product. The authors consider two special cases, for which the transformation  $f_k$  is either linear or exponential.

Cooper and Nakanishi emphasize the value of *elasticities* to characterize the relationship between market share and marketing instruments. Their primary use of the attraction model is as a tool to estimate the own and cross-price elasticities for each product, as well as the corresponding elasticities for other market instruments. Using the "fully extended" specification (1), the elasticity of brand  $i$ 's share to the market characteristics of each competing brand  $j$  can be estimated.

Estimation of total market size constitutes a subsidiary theme, receiving much less emphasis than that of market share. Explanatory variables for predicting market volume include volume in the previous period combined with the current prices and values of other market instruments.

The book begins with the formal models used to analyze market shares and competition. It includes a chapter on the scanner or point-of-sale (POS) data relied on for estimation, and a long chapter on the statistics of estimating market-share elasticities. These are followed by chapters on the "competitive map" (a tool for detecting competitive relationships among products), deci-

sion-support systems, and a concluding section suggesting important unresolved issues for future research.

The introductory chapter motivates the analysis by contrasting hypothetical conversations between a brand manager and marketing vice president. In the first conversation, the two wallow without reaching any understanding of their brand's situation; in the second they share a common language and tools for describing market outcomes and the relationship of outcomes to their own and competitors' strategies.

The second chapter develops the attraction model, provides alternative theoretical justifications for it, and relates market shares to consumers' probabilities of choosing each brand. The third chapter characterizes a range of monopolistic-competitive market structures relying on elasticities to describe the relationship between brand  $i$ 's share and brand  $j$ 's tactics. Issues of the differential effectiveness between types of market actions and the brands employing them are considered. An interesting transformation that can be applied to explanatory variables is introduced, the "index of distinctiveness." This transformation is comparable to replacing each observation by its exponentiated standard-normal transformation, except that it is much flatter near the mean of the variable across observations. The rationale is that minor differences in price or other attributes across brands are not important; the difference must exceed some minimum level for consumers to notice.

Chapter 4 provides useful background on the availability of POS data and issues involved in aggregation to the total market. The discussion of data reliability, including the various causes of error, is particularly valuable.

The fifth chapter addresses the statistical issues involved in estimating the attraction model in its various formulations. The various specifications can be estimated as linear regression models; in their attempt to make the techniques accessible, the authors go so far as to present data tables illustrating how the dummy variables are constructed and explain how to interpret the output from a standard linear-regression package. The methods are applied to sales data on several brands of ground roast coffee. I find the discussion of problems arising from zero market shares (the

dependent variable involves the logarithm of the share) to be somewhat misleading, as it seems to confuse a zero share with the separate issue of missing data.

Chapter 6 introduces the "competitive map" and illustrates it with the coffee example. The map is an attempt to aid interpretation of the large matrix of own- and cross-price (and other marketing action) elasticities by plotting brands in a lower dimensional space defined by eigenvectors of the estimated elasticity matrix. Two vectors are plotted for each brand, corresponding to the brand's "clout" (its influence on other brands' market shares) and its "receptivity" (the effect of other brands' actions on its share); the extent to which brand  $i$  is influenced by brand  $j$  is proportional to the cosine of the angle between  $i$ 's receptivity and  $j$ 's clout vector. Use of these maps appears to have promise, but the subtleties in their construction and the apparent inability to interpret the dimensions of the map pose difficulties. The authors seem to acknowledge as much by their disclaimer: "The full meaning of [the signals offered by a map] is better interpreted by managers and management scientists involved in these markets than by academic researchers involved in methods development" (p. 201).

Chapter 7 describes a market information system oriented to market-share analysis, developed by one of the authors. The system appears to be most useful as a training device, for classroom or corporate use. It provides graphical devices for analyzing market experience and the capability to simulate the results of a variety of market strategies.

The concluding chapter offers a fairly short list of topics the authors suggest are most deserving of future research. These range from estimation of the current models to integration of game theory and use of POS data from consumer panels. In my view, issues of the reliability of estimated elasticities and the stability of competitive maps are also important. Although not addressed in the book, the reliance on observational data to estimate tens or perhaps hundreds of elasticities is problematic, as each brand's mix of marketing variables is determined endogenously. Further work is required to determine how reliably simulations embedding these estimates can forecast the effects of new strategies, and thus how useful the esti-

mated elasticities are as guides for marketing decisions.

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Charles Brown, James Hamilton, and James Medoff, *Employers Large and Small*. Cambridge, Mass.: Harvard University Press, 1990. Pp. 144. ISBN 0-67425-162-8.

The basic argument of this 91 page presentation is that small firms, compared to large firms: (1) provide [only] a modest share of new jobs; (2) have lower wages; (3) poorer fringe benefits; (4) confront a higher per-employee cost for their labor force; (5) have poorer working conditions; (6) provide less job security; (7) are owned by wealthy individuals; and (8) have considerable political influence, particularly with regard to decisions undertaken by the Federal government. They conclude, therefore, that the popular image of small businesses as a major benefactor to the economy — despite a lack of political influence — is inaccurate. The authors insist that they have shown the converse to the true — that small businesses have substantial, political influence despite only modest, insignificant contributions to the economy. They propose interventions designed to benefit workers, which would make working conditions in small businesses equivalent to the conditions in large businesses. They do not attempt to demonstrate that the working conditions in typical small businesses are not socially acceptable. In fact, they only focus on comparisons of small and large businesses.

A substantial amount of research is reviewed in support of the two main features of their argument: (1) the advantages for working with a large firm; and (2) the disproportionate political influence of small firms.<sup>1</sup> One major implication of their presentation is that, since it is more advantageous to work for large firms, which provide about half of all jobs, small firms should have less political influence than they do. This is a curious position to advance.

In the U.S. it is currently assumed that influence on the political process is (and should be) related

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