Forest Products Marketing Research At Oregon State University

Robert O. McMahon

Abstract

Marketing research help is available to industry from Oregon State University's School of Forestry, and industry in turn influences the research program. Marketing, broadly viewed, encompasses creation as well as distribution of products desired by consumers. Research, focused on current problems affecting the state's forest products industry, has explicit international and domestic marketing objectives. Technological studies having significant marketing implications and industry acceptance come under the headings of product performance, timber engineering and design, improved processes and products, and utilization of wood and bark residues.

FOREST PRODUCTS MARKETING is one of six categories of the Forest Products Department's research program in the School of Forestry at Oregon State University. For some 34 years this program has been providing research assistance to the forest products industry in Oregon. Research objectives traditionally are focused on or justified by current problems confronting the industry.

Defined broadly, marketing not only encompasses the transferring of products from point of production to consumer but also the decisions that both precede and follow the transfer. These decisions include aspects of managerial planning and control fundamental to attainment of ultimate business objectives. Marketing, thus conceived, pervades a company's entire operation and structure.

Several projects conducted by the Forest Products Department have important marketing implications, though their immediate objectives are technological. These projects could be termed *implicit* marketing research. A much smaller portion of the Department's total program has *explicit* marketing objectives designed to solve specific marketing problems.

The Department's explicit program of marketing research began in 1966 when a position was established providing halftime to be devoted to forest products economics research and halftime to initiating an extension program in forest products marketing.

The combined position in research and extension provides a direct link between the Department and industry clientele who can utilize research results and provide feedback to keep the research program on target. The position also is intended to complement an existing halftime extension position occupied by a wood products technologist. Combining technological and marketing capabilities in one extension position contributes a more comprehensive and flexible response to industry needs.

Industry Influence on the Research Program

Industry can influence the scope and orientation of the Department's program in several ways so as to obtain needed research help. Extension's feedback to program design is important for obtaining suggestions from outside the Department and for shaping the program and making it responsive to real problems. Another influence is a formal research advisory committee, composed of leading representatives from industry, government, and the general public, whose function is to keep the program attuned to its mission and priorities and to reflect the differing points of view on research needs.

A third way in which industry can obtain research help from the Department, and which can affect the program at any time, is direct sponsorship of projects. A company, agency, or association may contract with the Department to solve a specific problem, paying all or part of the cost of a particular study by fee or grant. Projects

The author is Associate Professor in Forest Economics, Forest Products Department, Oregon State Univ., Corvallis, Oreg. This paper was presented at Session 4 – Marketing – of the 29th Annual Meeting of the Forest Products Research Society, June 16, 1975, in Portland, Oreg. It was received for publication in May 1975.

appropriate to private testing or consulting firms, or projects beyond the Department's expertise or ability to schedule, are not accepted.

The primary influence on program design remains the individual researcher. His knowledge and competence, plus continuing contacts with industry, give him a solid base from which to exercise judgment in choice of projects. Although all segments of the forest products industry benefit from the research program, the needs of medium- and small-size companies receive special consideration because of their limited capacity to conduct their own research programs.

Examples of Marketing Research

Since 1966 explicit marketing research has been of two kinds: field surveys to obtain general information and specific analyses of product or industry problems.

So far only two field surveys have been made. The first was a study of how Oregon firms organize for international marketing (8). The primary objective was to discover what external channels of distribution were being used and what internal organizational structures had been established. Through a combination of interviews and mail questionnaires, additional information also was obtained on product policy, pricing, promotion, and credit. This study was part of an analysis to determine need and potential for an extension program in international marketing.

The second field survey sought to learn how forest industry firms obtain information for product marketing decisions (11). Selected trade associations and companies in the Pacific Northwest were interviewed. Information obtained included attitudes of marketing managers toward use of market research techniques, organization of marketing research, the size of the budget, examples of projects undertaken, and problems encountered in applying marketing-research results. This was a project for a Master of Science thesis completed by a Finnish student on a fellowship. His specific objective was to find out how U.S. firms reach marketing decisions and to what extent their methods might be appropriate to Finnish companies.

The second main type of marketing study is for more specific problem solving. Of eight examples representative of this category, three were concerned with international trade and the rest with domestic problems.

All three of those dealing with international trade were thesis projects designed to capitalize on unique capabilities of graduate students and to investigate questions of import to Oregon's forest products industry. In the late 1960s strong concern had arisen regarding the ability of U.S. firms to gain and maintain competitive footholds in the European Economic Community (EEC), a potentially immense market. Because that community already had purchased significant quantities of kraft linerboard produced in the Pacific Northwest, the question arose as to whether U.S. firms could continue to compete favorably with other suppliers to the EEC.

A French graduate student with a degree in pulp and paper, who was familiar with European sources of information about demand in the EEC linerboard market, utilized international trade theory to guide an analysis of each supplying area's competitive advantage (12). U.S. exporting firms were surveyed to learn the effects of their marketing practices on trade positions. A Markov chain was used to estimate the relation between probability of repeated exports and sales of U.S. subsidiaries abroad (14). The EEC's share of future U.S. exports was obtained from this model. A second regression model was formulated to predict future levels of U.S. exports to the EEC.

This same student then expanded his study to examine ". . . those economic considerations that may limit the ability of the Pacific Northwest's pulp and paper industry to compete with other regions producing pulp, paper, and board for world markets" (13). International trade theory and a multiequation econometric model were used to explain linerboard export quantities and prices among the world's two major exporting and two major importing countries (15).

The third international trade study turned to another area of the world — the Far East (7). It similarly made use of a Ph. D. candidate's first-hand familiarity with an overseas region, its industry, and its data sources. This student examined structural changes taking place in the hardwood-plywood industry in the Far East, changes with important implications for Oregon firms because of the volume of hardwood veneer and plywood imported into Oregon and the United States. A theoretical model was based on a synthesis of international trade theories to explain four nations' actual performances and comparative advantages in exporting plywood. Econometric techniques were then used to construct and quantify import-export functions derived from the theoretical model to explain trade behavior and predict trade patterns for 3 years into the future.

In the second subset of studies concerned with domestic marketing problems, one investigated the structure of Oregon's pine millwork industry and the efficiency with which it has produced and marketed its products (1). Mail and personal interviews were used to gather data from all producers of pine millwork. Single- and multiequation models of the pine millwork market were developed and compared for their predictive capability. Major support for this study came from the USDA Western Regional Marketing project.

Another study examined economic efficiency in Oregon's particleboard industry (4) and led to a further brief analysis of the industry's immediate outlook, which included an intuitive analysis of marketing factors (5).

Oregon's pole and piling industry was the subject of another marketing study (10). Data on major markets, marketing procedures, and industry problems were obtained by personal interview to describe characteristics of this industry segment for which little information was available.

A study with a quite different objective was done on contract for a local utility company to determine the volume of wood and bark residue from forest products firms available for fuel during the next 20 years (9). Interviews with potential suppliers were the basis for compiling the estimate. The purpose was to develop a

new market outlet and a higher value use for an underutilized material.

Another study, still in process, seeks to improve industry use of a marketing management tool, lumber futures (6). The purpose is to elaborate a framework to help managers decide how and when to use this tool. The impetus came through extension teaching that revealed a need for a methodology for understanding price relationships. Statistical analysis, including correlation and regression techniques, was used to develop the rationale and ultimate strategies for producers hedging with futures.

Technological Research With Marketing Implications

With two exceptions (the studies of the millwork and pole and piling industries), the foregoing projects were part of the economics and marketing research within the Forest Products Department. Four of the other five divisions of the Department's research program also are linked closely to marketing, because, as indicated earlier, they include decisions on product design that precede the manufacturing and distributing of products to consumers. These four divisions — concerned with product performance, timber engineering, improved processes and products, and use of wood and bark residues — are attempting to develop products that serve consumer needs better or, in the case of wood and bark residues, to find better uses for the material. Counsel from individual companies, industry associations, and regulatory agencies normally is sought during design and implementation phases of these research projects to gain acceptance and understanding of results by both producer and user groups.

Brief descriptions of a few illustrative projects in these divisions will suggest their marketing implications.

Assurance of Product Performance

Strength of finger joints in molding was studied to assist in development of an ASTM standard for adhesives used in nonstructural glued-lumber products. More than 2,000 pieces of finger-jointed ponderosa pine from mills in Oregon, California, and Montana were subjected to bending and tension tests to evaluate the effect of various adhesives, different finger joints, and mill practices.

The design and testing of large glued-laminated beams made of nondestructively tested lumber led to approval of Voluntary Products Standard PS 56-73, granted by the National Bureau of Standards. The research developed guidelines for nondestructive testing and some visual grading for more efficient use of lumber in glued-laminated beams.

Timber Engineering and Design

Over an extended period a series of tests were performed on 20- by 60-foot wood roof-section diaphragms constructed with different materials and by different methods. Results of the tests are useful to designers and engineers for improving safety and performance of wood structures subjected to earthquake and wind loads.

When five lumber associations needed to know whether certain stud grades would meet new FHA strength specifications, performance tests on exterior stud wall systems were conducted to determine resistance to combined vertical roof loads and horizontal winds loads. Results showed that walls constructed with spruce studs were capable of withstanding loads from two to four times greater than recommended design specifications, more than sufficient to meet building code requirements.

A current project seeks to relate human responses to vibration to certain measurable dynamic and static characteristics of wood floors. Laboratory tests on 24 full-size floor sections evaluated human response to walking and impact vibration and led to development of statistical measures for predicting response. Pilot field tests of occupied dwellings for a broader study of human acceptance of floor vibration followed the laboratory tests. The ultimate aim is to design better floor systems for dwellings.

Improvement of Processes and Products

A nationwide cooperative study with electric utility companies investigated use of various fumigants for arresting decay in standing transmission poles. Treatments were to be repeated at 5-year or longer intervals. Bioassay procedures were developed to study the movement of fumigants in sound poles and to evaluate the effectiveness of spraying western redcedar poles with pentachlorophenol solutions. The assay procedure is now used to determine when a utility company should schedule retreatment to protect the groundline zone of pressure-treated poles.

When new industry standards for structural lumber increased the importance of accurately measuring moisture content, a project was initiated to study the relative accuracies of a radiofrequency power-loss meter and a resistance meter. Because lumber inspection agencies and sawmills use both, study results made possible a greater degree of precision in coordinating moisture meter readings.

Utilization of Wood and Bark Residues

Transportation costs emerged as an essential element in the economics of utilization or disposal of wood and bark residues, and a study showed them to be generally a linear function of distance. Truck, rail, and barge transport methods were analyzed, and factors influencing costs of and limiting use of each method were identified.

Shortages of fuel and electricity and rising costs of energy prompted an analysis of the fuel potential of wood and bark, an examination of historical trends in their use, a summary of their fuel properties, and technical and economic considerations governing their use as fuel. Because of high transportation costs resulting from low heating value per unit of volume or weight, wood and bark residues were judged to be economical fuel only where they are produced. Local use would help to solve otherwise troublesome and expensive problems of residue disposal.

Pressurized disk refining followed by other segregation and treating methods yields Douglas-fir bark fibers exceptionally well suited for reinforcing the impact strength of plastics. This finding could contribute to further rapid development of reinforced plastics and provide another market for a bark residue fraction.

In addition to these projects, many more contributions to marketing knowledge arising from

technological research can be found in the School of Forestry's list of publications (2, 3) under such headings as timber in structures, wood waste utilization, wood preservation, drying and seasoning, composite boards, and bark products.

Application of Research Results

Application of results is not always as easy to document as researchers might wish, both because of the well-known timelag and the fact that adoption is not always publicized by users.

One example of application among the projects discussed, however, is the development of futures trading strategies. Early response from industry and brokerage houses indicates eager demand for results that provide an innovative approach to developing a lumber hedging program.

Results from fee or grant projects probably have the greatest potential for adoption. The project on hog-fuel availability (9) is an illustration, with the sponsor ready to make immediate use of the findings.

Two recent instances of application of technological research had dramatic marketing impacts. After the Department of Housing and Urban Development (HUD) discontinued acceptance of Utility-grade framing for bearing partitions and exterior walls in 1970, a cooperative study between industry associations and the Department developed technical data that convinced HUD to reverse its directive and again permit Utility studs in single-story construction. Industry representatives also have reached tentative agreement with HUD to reconsider acceptance of Utility framing for two-story construction, pending final results of theoretical analyses leading to a rational design procedure for stud wall systems. In other words, a market apparently lost was regained through research.

A second example is the Douglas-fir bark-wax extraction plant recently completed by Bohemia Incorporated near Eugene, Oregon. The plant utilizes a process the precursor of which was developed through departmental research some years ago. Now economically feasible, the process provides a high-value, though initially small-scale, market for bark residues.

Conclusion

Marketing, or any other type of research at an academic institution, normally has several goals in addition to immediate project objectives. One is to provide research experience for graduate students. Another is to supplement and enhance the teaching function by faculty involvement with real-world problems through research. A third is to give attention to questions the answers to which may not have immediate application in industry.

All of these are corollary objectives of Oregon State University's forest products research program, which has a unique responsibility, historically derived, to serve needs of manufacturers and users of forest products. A continuing challenge facing the program is to keep these objectives balanced internally while still responding effectively to industry use of the Department's services.

Literature Cited

1. Bandrowski, S. S. 1973. An economic analysis with emphasis on stochastic evaluation of the structural and marketing changes of the Oregon millwork industry. Ph. D. thesis, Oregon State Univ., Corvallis, Oreg.
2. Forest Research Laboratory. 1974. Annual Report 1974. School of Forestry, Oregon State Univ., Corvallis, Oreg.
3. Forest Research Laboratory. 1975. Publications of the Forest Research Lab., 1941-1975. School of Forestry, Oregon State Univ., Corvallis, Oreg.
4. Johnson, Walter, W. 1973. The efficiency of the particleboard industry of Oregon. Ph. D. thesis, Oregon State Univ., Corvallis, Oreg.
5. _____, and Robert O. McMahon. 1974. Future outlook for Oregon's particleboard industry. Forest Prod. J. 24(1):13-15.
6. Kingslien, Hal, and Robert O. McMahon. 1976. A Lumber Futures Trading Manual for the Lumber Industry. Ms. in preparation, Forestry Extension, Oregon State Univ. Extension Service, Corvallis, Oreg.
7. Lee, Gin-fu L. 1973. The structure of the hardwood plywood industry in the Far East exporting countries: Japan, Republic of China, Republic of Korea, and the Philippines. Ph. D. thesis, Oregon State Univ., Corvallis, Oreg.
8. McMahon, Robert O., Philip B. Schary, Arthur I. Stonehill, and Donald M. Taylor. 1968. Organizing for international marketing: the experience of Oregon firms. Northwest Business Management 5(2):20-34.
9. McMahon, Robert O. 1975. Mill and woods residues tributary to Eugene, Oregon, available for steam generation. Research Bulletin 19, Forest Research Lab., School of Forestry, Oregon State Univ., Corvallis, Oreg. (In press.)
10. Randall, Robert M., and Charles F. Sutherland, Jr. 1974. Marketing Oregon-produced poles and piling. Research Paper 24, Forest Research Lab., School of Forestry, Oregon State Univ., Corvallis, Oreg.
11. Sainio, Jorma K. 1970. Production of information for marketing decisions in forest industry firms. M.S. thesis, Oregon State Univ., Corvallis, Oreg.
12. Thevenon, Michel J. 1970. U.S. – E.E.C. trade in kraft linerboard: a study of current and future U.S. exports and marketing practices. M.S. thesis, Oregon State Univ., Corvallis, Oreg.
13. _____. 1972. An economic analysis of pulp, paper, and board exports from the Pacific Northwest. Ph. D. thesis, Oregon State Univ., Corvallis, Oreg.
14. _____, and Robert O. McMahon. 1973. A Markov chain approach to analysis of kraft linerboard export patterns. Tappi 56(6):149-152.
15. _____, and Robert O. McMahon. 1974. A quarterly econometric model of international trade of kraft linerboard. Tappi 57(3):161-162.