MONTHLY REVIEW

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FEDERAL RESERVE BANK OF MINNEAPOLIS

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Prospects for the region's western softwoods industry

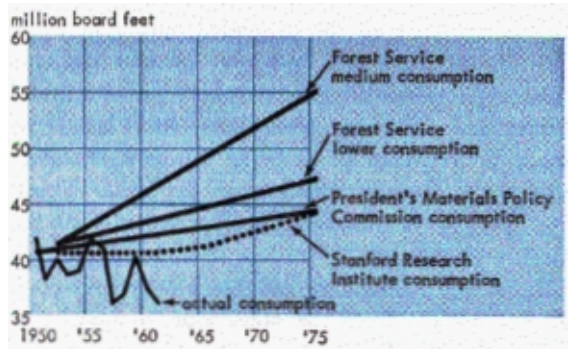
General market prospects for forest products have been treated in a number of extensive studies within the framework of an expanding and progressing national economy. Given what we have learned about our regional timber situation, we shall see in this final article how these over-all findings apply to conditions in our own area.

The national studies foresee *expansion* in timber production generally as well as in most specific lines of timber products. Presumably an economy with a rapidly growing population, with an even more rapidly growing appetite for raw materials, and with a suitably improving level of technology would demand more wood from its forest industry sector. This prediction, of course, assumes that the cost of obtaining the expanded quantities is not prohibitive. All the studies have attempted to take some account of the impact of possible price changes on demand.[1]

PROJECTED NATIONAL DEMAND AND ASSOCIATED PRICE EFFECTS

Projections from three studies of lumber prospects are summarized in Chart 1. Lumber production is not, of course, the only outlet or potential outlet for our region's timber, but it is a particularly significant one since it represents the dominant consumption use of the western softwoods grown here. Currently nearly 90 per cent of the cubic volume of timber cut in the region goes into lumber, about 8 per cent into other whole wood uses (poles, posts, mine timbers, etc.), and about 1 per cent into pulpwood. Production of veneer logs and bolts is still relatively minor in our region, but it has expanded in recent years.

Chart 1—Projections of United States lumber consumption to 1975



The projections made in these studies are conditional statements, rather than predictions, for they are based on several major assumptions about the state of the economy, its productivity, and level of activity. Most of the studies assume: (1) that the added volume of materials called for will be forthcoming only at higher real prices, and (2) that the higher prices, in turn, will stimulate the substitution of other materials for wood and the

[1] See for example:

Davis, John, **The outlook for the Canadian forest industries**; Ottawa, Royal Commission of Canada's Economic Prospects, 1957. 261 p.

Guthrie, J. A. and Armstrong, G. R., **Western forest industry, an economic outlook**; Baltimore, Johns Hopkins Press, Published for Resources for the Future, Inc., 1961. 324 p.

Stanford Research Institute, **America's demand for wood 1929-1975**; Tacoma, Weyerhaeuser Timber Co., 1954. 94 p.

U. S. Forest Service, **Timber resources for America's future**; Washington, D. C. Govt. printing office. U. S. Dept. of Agriculture, Forest research report no. 14, 1958. 713 p.

redesigning of wood-using products to get by with less wood. These conditions would largely extend long-term trends of the past.

By 1975, all these projections agree, United States lumber consumption should increase several billion board feet above the midcentury level of about 41 billion feet. Interestingly, however, the amount of lumber actually consumed per year since these base data were projected suggests, if anything, a *downward* drift, with sharp fluctuations superimposed from year to year.

By and large, the studies claim that United States lumber production can expand only by drawing on more of the higher cost sources, with accompanying higher prices and some substitution of competing materials. Most studies agree that the largest share of any projected increase in lumber production in the United States must be supplied by western softwoods, which currently account for two-thirds of the nation's lumber supply. These forests of the West will probably have to supply virtually all the expanded output to 1975. The Rocky Mountain States in general and our region in particular have substantial marginal forest lands; industry must extend itself into these lands in response to growing national demands and to the eventual depletion of the good accessible old growth stands located principally in the Pacific Northwest.

Improved technology and machinery help push at this margin from the other side, to make formerly bypassed stands commercially feasible. Additionally, the relatively small and scattered market for lumber in the Mountain States is expected to grow fairly rapidly during the years ahead.

These trends all suggest that prospects for continued expansion of the timber industry in our district are good.

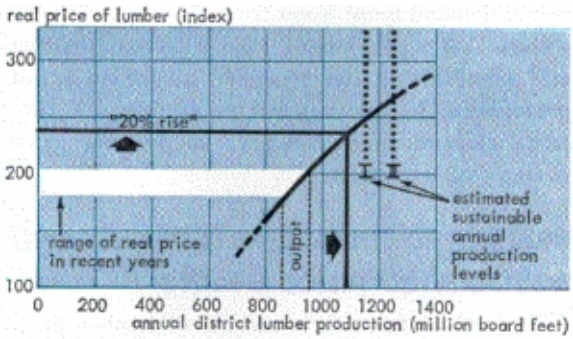
This article is the third and last of a series based on a study recently published by the Federal Reserve Bank of Minneapolis. Readers interested in obtaining copies of the original 64-page study, **The Timber Economy of the Ninth District West,** by Clarence W. Nelson, may secure them at $1.00 per copy by writing Publications Section, Research Department, Federal Reserve Bank, Minneapolis, Minnesota (55440).

HOW MUCH EXPANSION POTENTIAL?

Any attempt to project regional output quantitatively is hazardous at best. We can derive a very crude indication of the possible magnitude of expansion by applying a projected price increase to the schedule developed in the first article of this series. The results are shown in Chart 2. For our purposes we might reasonably assume that the real price of lumber will rise about 20 per cent from current levels to 1975. If other circumstances remain unchanged, such an increase would expand the economic range of profitable timber operations in the district. The corresponding output increase of roughly a tenth or more is physically feasible, but it pushes output fairly close to the maximum sustainable levels of sawlog production as assessed in earlier Forest Service studies.

However general, this projection should emphasize that several of the basic factors that have

Chart 2—Conjectural relationship between the region's lumber production and real price of lumber



stimulated regional timber expansion in the postwar period are likely to operate over the next decade or longer. The magnitude of expansion is not limited by physical factors, since the physical potential is extremely large relative to current use. The magnitude of expansion will be limited principally by the opportunities for profit, and these, in turn, are strongly influenced by product price.

PRODUCT AND AREA OUTLOOK: A MORE COMPLICATED PICTURE

As we have already stressed, to speak of a single general demand for timber greatly oversimplifies the case. In practice, we have a wide variety of grades of raw materials and a variety of products, each of which has a somewhat different market outlook. Furthermore, some of the forest materials available in the district present special problems, and conditions vary from area to area within the district.

Estimates of sustainable production prepared for a 1959 Forest Service study (see Table 1) provide a more realistic insight into expansion prospects. The particular product breakdown shown is *not* a prediction of what is likely to happen. But it does reflect a division of logs among a varied grouping of industries that appeared to Forest Service analysts to offer balanced utilization of material and to correspond to a desirable management program if applied to all forests.

In general, we can note from Table 1 that most of the physical expansion potential lies in smaller size and lesser quality products. Expansion factors are very large for poletimber products in all areas and very small for sawtimber products. The data in Table 1 also illustrate projections for specific areas within the district, as follows:

Western Montana

In western Montana, the sawtimber potential is largely used up. Some localities, as pointed out earlier, have more headrig capacity than timber production potential. Hence, the Forest Service envisions some reduction in sawmill capacity in western Montana. Indeed, the industry in general expects little expansion in lumbering in that area.

Table 1 also indicates that a considerable jump in sawlog output would be allotted to veneer production in western Montana. Attuned to the rapid-

TABLE 1—ESTIMATED SUSTAINABLE ANNUAL PRODUCTION COMPARED WITH ACTUAL 1957 PRODUCTION FOR VARIOUS FOREST PRODUCTS

Product	Estimated production 1957	Expansion permissible to estimated sustainable production levels*
Western Montana		
Lumber and dimension	812MM bd. ft.**	— 62MM bd. ft.
Veneer	8MM bd. ft.	+ 72MM bd. ft.
Large poles (30' & longer)	10MM bd. ft.	+ 15MM bd. ft.
Subtotal	830MM bd. ft.	+ 25MM bd. ft.
Small poles (less than 30')	93M pieces	+ 407M pieces
Pulpwood	4M cords	+1,230M cords
Fiberboard	0	+ 200M cords
Fence posts	270M pieces	+3,330M pieces
Chemical wood	0	+ 88M cords
Fuelwood	94M cords	+ 6M cords
Subtotal (cu. ft. equivalent)	8,264.5M cu. ft.	+114,975.5M cu. ft.
Eastern Montana		
Lumber and dimension	130MM bd. ft.	+ 185MM bd. ft.
Veneer	0	+ 48MM bd. ft.
Large poles (30' & longer)	3MM bd. ft.	+ 17MM bd. ft.
Subtotal	133MM bd. ft.	+ 250MM bd. ft.
Small poles (less than 30')	91M pieces	+ 309M pieces
Pulpwood	23M cords	+ 961M cords
Fiberboard	0	+ 160M cords
Fence posts	464M pieces	+2,836M pieces
Chemical wood	0	+ 92M cords
Fuelwood	86M cords	0
Subtotal (cu. ft. equivalent)	9,252M cu. ft.	+91,363M cu. ft.
Black Hills		
Sawtimber products	50MM bd. ft.	+ 35MM bd. ft.
Poletimber products	12M cords	+ 108M cords

*Under Forest Service recommended management program.

**M = 1,000; MM = 1,000,000.

ly expanding plywood market, veneer production clearly offers the best prospects for growth in the wood-using industry in that section. The area's industry has already set its sights well beyond the veneer log consumption level suggested in Table 1.

The problem of dividing the available larger material (sawtimber-size logs) in western Montana between various possible uses will have to be worked out by the timber processors in response to market criteria. Since there is no oversupply of large logs, competition will probably force considerable readjustment in the industry's operations.

Most western Montana plywood producers prefer to take large logs, but they do not require the best grade logs, since the sheathing plywood produced at these plants does not demand clear logs. Most would prefer to sell or trade clear-type butt logs to sawmills and to use the cheaper large common logs in their plywood plants. As a result of these conditions, lumber mills may move toward the use of small common and large clear logs exclusively.

Market adjustments among species may be in the offing, too. Increased demand for Douglas-fir and especially for larch to meet expanding plywood and dimension requirements, according to the views of some industry authorities, will eventually boost prices of these species above those of ponderosa pine, reversing the traditional preferences and price relationships.

The smaller material (poletimber) in western Montana shows very large expansion possibilities. In Table 1, most of this is recommended for allocation to pulpwood, which we shall discuss later.

Eastern Montana

The potential for sawtimber expansion is relatively greater in eastern than in western Montana. The figures in Table 1 indicate that production of lumber could be doubled at the very least, while increasing the cutting of sawtimber-size trees for veneer and large pole operations. Actually, according to the Forest Service calculations, some of the expansion of sawtimber cuttings in eastern Montana would be contingent on the development of industries also using the small trees because: (1) the costs of developing these stands (which tend to be more remote from mill sites than those in western Montana) can be shared by several users, and (2) balanced cuts can be made in accord with the over-all management plan. The indicated expansion potential of 185 million board feet of lumber would supply roughly ten moderate-size sawmills (80,000 board feet per day lumber output).

Several new types of operation, including fiberboard and chemical wood plants not now present in Montana, are visualized in the Forest Service projection; these would take advantage of materials in some of the sizes and grades not usable in more conventional operations. But the sector with the most impressive expansion potential here, as in western Montana, is *pulpwood.*

Black Hills

Timber output in the Black Hills currently falls well below capacity. A private survey of possibilities for sawmill expansion in the Black Hills indicates that at least one new sawmill of moderate size could be supported by the available timber. As in Montana, competitive elimination of marginal mills is likely to continue. Here, too, the unused pulpwood or poletimber potential is still substantial.

PULPWOOD RESOURCES AND REGIONAL PULP AND PAPER INDUSTRY

The outlook for pulp-making is harder to evaluate than are the prospects for lumber and whole wood products. We do know that demands for wood fiber products are universally expected to continue expanding sharply and that this district has very large supplies of pulpwood available at low cost at the site. Nevertheless, the economics of pulp- and paper-making are much different from those of lumber, and one cannot foresee the extent

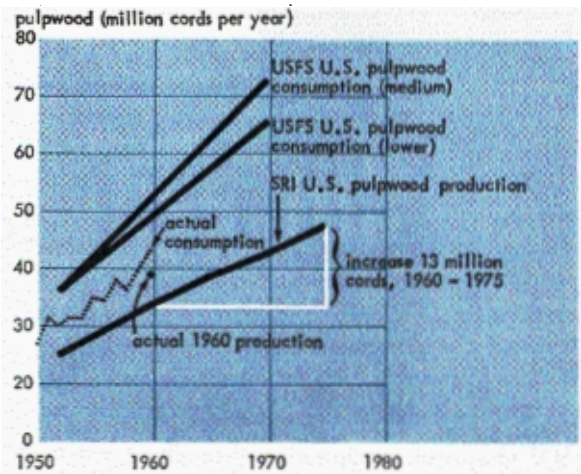
to which the national pulp and paper industry will choose to depend on district wood sources by the year 1975. We saw in the case of softwood lumber that if the economy wants to obtain the increased quantities projected, the Rocky Mountain States, including our timber region, must share more heavily in its production. The pulp and paper industry, however, faces diverse alternatives both as to location and as to type of raw material.

Only in the last decade or so has the pulp and paper industry chosen to locate its pulp-making facilities in the Mountain States. Mills in Wisconsin have used some softwood pulpwood from Montana and Colorado rather than shifting some of their own operations to the site of readily available softwood supplies. One of the big drawbacks of the mountain area has been its distance from major markets; a mill located in the Mountain States would have been in poor position to compete with Pacific Coast mills for coastal markets or with Lake States mills for midwestern and eastern markets. Thus the Mountain States have been decidedly secondary in competitive attractiveness for investment during the postwar period. Meanwhile, major expansions of facilities have occurred in the South and in the Pacific Northwest. Although pulpwood supplies in these areas have become increasingly committed to existing plants, ample headroom still exists for expansion in both areas, especially in the South.

If national pulp requirements grow as much as expected,[2] considerable pulping capacity will have to be added. But since plant sizes and capital requirements in the paper industry are very large, location decisions must be based on a careful weighing of many market, raw material, and operating factors. Projections made in the studies we have cited earlier indicate a near doubling of pulpwood consumption over the quarter century 1950 to 1975, as shown in Chart 3.

[2] Current pulp output levels actually exceed a number of vintage 1950 expectations for growth. Lumber production, in contrast, has fallen well short of most projections made a decade ago.

Chart 3—Projections of United States pulpwood consumption and production to 1975



Assuming an average indicated rate of growth, the pulpwood consumption would have to expand by 13 million cords annually between 1960 and 1975 in order to turn out an additional 19 to 20 million tons of paper and board a year. This expansion would require the equivalent of roughly 60 large new pulp and paper plants (300,000 tons annual capacity).

Just how much of this new capacity might find its way into our district by 1975 is an open question. The Stanford Research Institute's projections for major regions suggest that about 60 per cent of the expanded output will come from forests of the South. About 20 per cent will come from western states, mainly arising from expanded use of mill residues. The great bulk of the western states' pulp-making capacity is located in coastal Washington and Oregon, and most of the future expansion is expected to occur there. Western pulpwood requirements are projected by SRI to rise from six million cords in 1960 to nine million cords annually by 1975.

Given the anticipated growth in national demand and the prospect that population growth and in-

(Continued on page 10)

Current conditions . . .

Widespread precipitation throughout much of the district during May corrected the subsoil moisture deficiencies and provided a strong start to the new crop season. Stock water reservoirs also were refilled by the run-off. Surprisingly, the driest part of the region by late May was the Chippewa Falls area of Wisconsin. In the extreme western areas heavy snow fall in the mountains in late winter and early spring increased the snowpack much above normal, thus insuring generous irrigation water supplies in 1964.

In most areas, the district's over-all economy is seen as expanding moderately. Total personal incomes have leveled off recently but were still 4.5 per cent ahead of April 1963. Bank debits have continued to expand, rising about 13 per cent above year-ago levels. The latest data on construction as measured by new building permits and contract awards suggest increased activity. Statistics on the industrial use of electric power also continue to improve, indicating higher industrial output in the region. Finally, iron ore shipments from the Lake Superior ports got off to an early start with 3.7 million tons shipped during April compared with only a half million tons shipped in April 1963.

On the other hand, some district measures continue to show a lack of vigor. Farm incomes have been depressed by lower prices for cattle and some other farm products. Nonagricultural employment, for example, is up only 1 per cent from year-ago levels, and the district's index of department store sales continued weak through April.

Nevertheless, most of the larger business firms in the area are planning to expand output during this second quarter and, assuming normal crops this summer, the region should fare quite well.

In district banking, a more vigorous demand for loans was observable in recent weeks, particularly demands at country banks for loans to finance new crop operations. Commercial and industrial loans, however, have increased only moderately through late May, reflecting in part a lack of credit demand for business inventory buildup. Recent increases in all loans and lack of a comparable deposit response have resulted in a slight increase in loan-deposit ratios. At country banks this ratio of 51.9 per cent is near the postwar peak of 52 reached in June, 1961. This trend, along with a trend toward net purchases of federal funds by district banks and some increase in borrowings at the Federal Reserve Bank of Minneapolis suggest a slight decline in bank liquidity during recent weeks.

The following selected topics describe particular aspects of the district's current economic scene:

FEED GRAIN PROGRAM

Farmer participation in the 1964 Feed Grain Program will add an estimated $107 million to district farm income through acreage diversion payments. As shown in the table below, a larger proportion of farms participated in the program in the district than in the United States as a whole. Those district farmers in the program, however, typically took a smaller proportion of their base acreage out of production than the over-all average.

1964 FEED GRAIN PROGRAM PARTICIPATION

	Proportion of farms participating	Proportion of total base acreage diverted	Proportion of base acreage diverted on participating farms	Diversion payments (millions of dollars)
Minnesota	57%	26%	37%	59
Montana	40	28	44	7
North Dakota	65	30	40	21
South Dakota	49	22	37	20
4 States	55	26	38	107
U. S.	41	26	44	923

In general, the larger farms found the program advantageous; the 55 per cent of the district farms participating accounted for almost 70 per cent of the district's feed grain acreage. Per acre diversion payments ranged from a low of $11 in North Dakota to $26 in Minnesota. The district average amounted to $18 per acre, as compared with a national average of $27 per acre.

BANK CREDIT

Outstanding loans at district member banks, after showing only a normal seasonal rise during March, moved up somewhat faster in April (March 25 to April 29) as both country and city banks expanded loan portfolios above the seasonal rate. The gain in loans, excluding interbank loans, totaled $44 million, more than twice the advance of last April and one-third more than the average April increase. Loans at country banks, reflecting in part a heavier demand for farm credit in order to carry out 1964 operations, rose $27 million to account for most of the increase in the district. The rise at city banks, though not as sizable, was nevertheless strong relative to comparable periods in the past; the gain totaled $17 million, about twice the usual increase. While loans to brokers and dealers and "all other loans" advanced, loans to nonbank financial institutions were steady, in contrast to their usual decline. Both these trends accounted for the relatively stronger performance of total loans. Commercial and industrial loans at city banks were also up, but the rise was relatively small.

The April advance in district bank loans was partially offset by a contra-seasonal decline of $16 million in investments, a decline which occurred for the most part at city banks and reflected sales of Treasury securities made to accommodate loan expansion as well as to compensate for reserve losses. As a result of the drop in investments, total credit at district member banks advanced only $28 million during the month, somewhat more than last year but less than the average April increase.

The April increase in loans, coupled with a decline in deposits, brought loan-to-deposit ratios to higher levels. At country banks the ratio increased to 51.9 per cent at the end of April, only one-tenth of a point below the postwar peak of 52.0 per cent reached in June 1961. At city banks the loan-to-deposit ratio rose to 57.6 per cent, still several points below the peak of 61.7 per cent attained in May 1960.

Statistical review available

Copies of the **1963 Annual Statistical Review**, presenting data for principal statistical series relating to the Ninth Federal Reserve district, are now available from the Research Department of this bank.

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continued from page 7)

dustrial development within the Rocky Mountain-Great Plains area will also continue, the likelihood that additional pulp- and paper-making capacity will be located in the region seems great. Montana's first pulp and paper mill has now been operating for some six years, and a second one was proposed at about the same time, although actual construction has been delayed indefinitely. Plant expansion, now an accomplished fact in western Montana, indicates that for some types of pulp and paper production the point of profitability has now been reached.

The Forest Service concluded from its study of Montana's capabilities that under its hypothetical allocation of products more than two million cords of pulpwood could be cut on a sustainable basis. Since the state's live pulpwood cut is small, and since the new pulp mill operating at Missoula uses only sawmill residues, practically no inroads have been made on the immense potential of live timber.

Potential pulp mill sites

In contrast to the fairly general availability of sawmill sites, the number of sites suitable for pulp mill operations is relatively restricted. For one thing, under foreseeable circumstances there can be no such thing as a *small* pulp mill. In order to be efficient and competitive today, pulp mills must be constructed on a large scale with a minimum suitable capacity of at least 200 tons of pulp a day. Capital requirements for such a mill would be greater than $5,000,000, compared with about $500,000 to $1,500,000 for a medium sawmill (100,000 board feet per day) and less than $100,000 for a small stud mill.

Furthermore, pulp mills need very large volumes of water, not so much for the process itself as for diluting the wastes that ultimately must be discharged for the operation. Location requirements therefore include not only central access to a sufficiently large supply of timber or mill residues but also location alongside a stream course with adequate water flow.

From all these viewpoints, western Montana offers the best sites in the region. All mill sites are closer there than they are in other parts of our region to blocks of timber and to larger concentrations of sawmills from which chipped mill residues may be taken. In eastern Montana, for example, stream flows are not quite as large or regular, and otherwise suitable sites are located in open areas far from blocks of timber. Some sites already have too much existing pollution (e.g., the Billings-Hardin area), according to surveys made in conjunction with the United States Public Health Department and the Montana Board of Health. The Black Hills uplift has no really adequate stream flow for pulping; private interests have investigated without apparent success the possibilities of a small mill (50 tons per day) using well water to augment local stream flow.

Although we have talked in terms of supplies of live pulpwood, the actual potential raw material base for pulp operations is larger. For the western states as a whole, abundant sawmill residues offer a far better opportunity for expansion than do whole wood logs. In Montana, some capacity for expanded use of mill residuals exists. The Waldorf-Hoerner plant at Missoula, with a 500-ton daily pulp capacity, requires some 250,000 units of chips per year. Existing Montana sawmills, mostly in the northwestern part of the state, conceivably could produce more than twice this amount at their current operating capacities.

While the economics of procurement remain unknown, vast stores of dead wood exist, and much

of this wood is suitable for pulping. Tests by the USDA Forest Products Laboratory show that the dead trees retain excellent pulp properties, even after long periods in dry storage on the stump.

In short, the supply of raw material for pulpmaking in the district's west is enormous. Eventually, given continued national growth, several of the potential pulp mill sites will be actively occupied. The pace of expansion, however, will probably continue to be slow, largely because of the relative remoteness of our area from major markets.

SUMMARY OF PROSPECTS AND IMPLICATIONS

The available unused timber volumes in our region could support an increasing harvest of wood from all major areas in response to growing national demands. The form and location of added processing capacity will vary, with the best opportunity for pulp expansion in western Montana and perhaps the best opportunity for additional new sawmill capacity in eastern Montana.

As we mentioned before, western Montana is close to saturation — and in some sections, overcapacity — in sawmill capacity. The Forest Service has warned that the higher quality species such as ponderosa pine actually are being taken at a greater than sustainable rate in this sector of Montana. But even with these qualifications the potential for expansion in wood volume is considerable. Sawmill numbers actually may decline under the circumstances, but a larger volume of wood processing is possible nevertheless.

The picture is different in eastern Montana, where the greater room for expansion has brought a relatively faster growth in sawmills since 1950. The potential is still large; but because of the rough topography and increasing development and logging costs, this potential is not quite as large as was originally expected. Continued expansion in sawmill operations depends to a large extent on the success of the new sawmills designed to handle the smaller size lodgepole pine. There is room for development of various other whole wood products using larger tree sizes.

In the Black Hills area moderate sawmill expansion is possible, and the substantial pulpwood or poletimber potential is largely untapped.

Even if correct in general direction, the foregoing survey of expansion possibilities overlooks a number of complexities. Product markets for lumber and many derived wood products are subject to strong cyclical fluctuations. Purchasers of public timber must yield to the constraints arising from public policy (for example, policies of making sales in small quantities so as to maintain existing mills) and may thus not be able to commit large capital investments for future expansion. Natural catastrophes (such as the spruce bark beetle infestation) may create pressures for temporary expansion in particular species or products.

Thus, the real-world market does not allow for steady and predictable introduction of new plant capacity. Owners may complete capital expansion, planned to take advantage of expected longer-term growth in demand, only to face a slump in the market and depressed product prices for two or three years. The inroads that may be made in the meantime by wood substitutes, new uses, or wood products from areas outside the district may throw other difficulties in the way of profitable operation. Decisions in the past have had to be made in just this sort of environment. No matter how strongly past trends suggest that the future market will ultimately grow, decisions to invest in such facilities inevitably involve a gamble.

— CLARENCE W. NELSON

FEDERAL RESERVE BANK OF MINNEAPOLIS

50th Anniversary