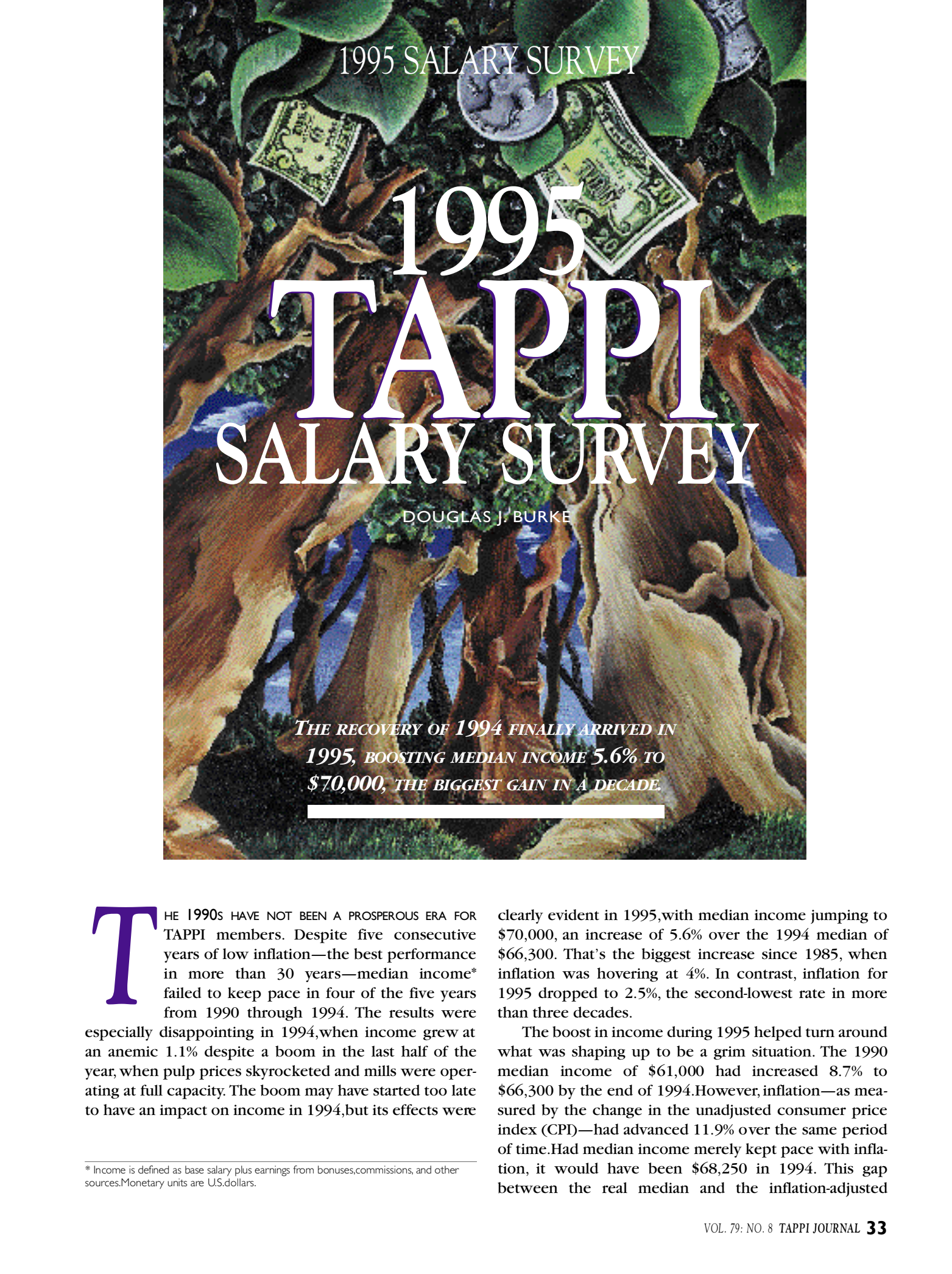




1995 SALARY SURVEY

1995 TAPPI SALARY SURVEY

DOUGLAS J. BURKE

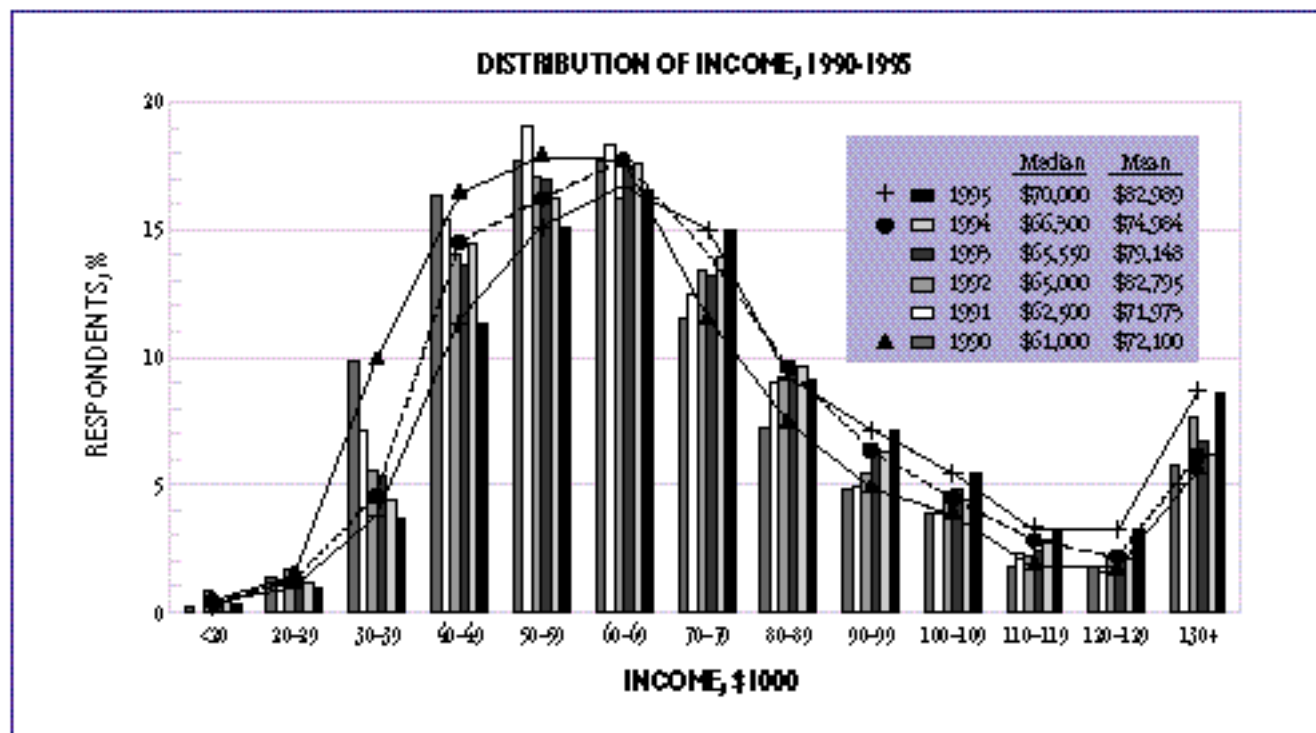
*THE RECOVERY OF 1994 FINALLY ARRIVED IN
1995, BOOSTING MEDIAN INCOME 5.6% TO
\$70,000, THE BIGGEST GAIN IN A DECADE.*

THE 1990S HAVE NOT BEEN A PROSPEROUS ERA FOR TAPPI members. Despite five consecutive years of low inflation—the best performance in more than 30 years—median income* failed to keep pace in four of the five years from 1990 through 1994. The results were especially disappointing in 1994, when income grew at an anemic 1.1% despite a boom in the last half of the year, when pulp prices skyrocketed and mills were operating at full capacity. The boom may have started too late to have an impact on income in 1994, but its effects were

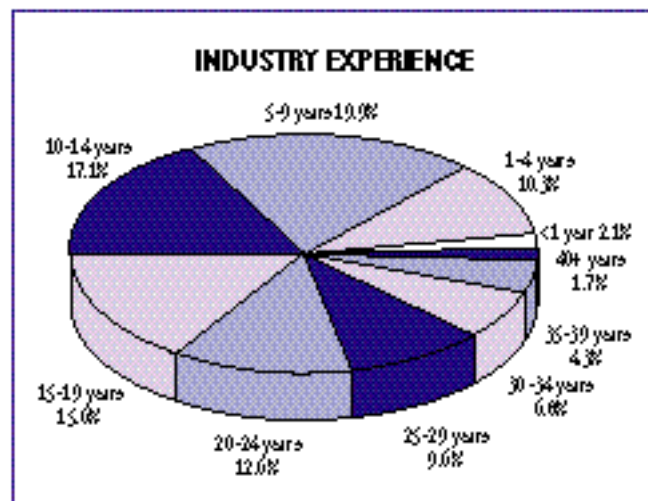
clearly evident in 1995, with median income jumping to \$70,000, an increase of 5.6% over the 1994 median of \$66,300. That's the biggest increase since 1985, when inflation was hovering at 4%. In contrast, inflation for 1995 dropped to 2.5%, the second-lowest rate in more than three decades.

The boost in income during 1995 helped turn around what was shaping up to be a grim situation. The 1990 median income of \$61,000 had increased 8.7% to \$66,300 by the end of 1994. However, inflation—as measured by the change in the unadjusted consumer price index (CPI)—had advanced 11.9% over the same period of time. Had median income merely kept pace with inflation, it would have been \$68,250 in 1994. This gap between the real median and the inflation-adjusted

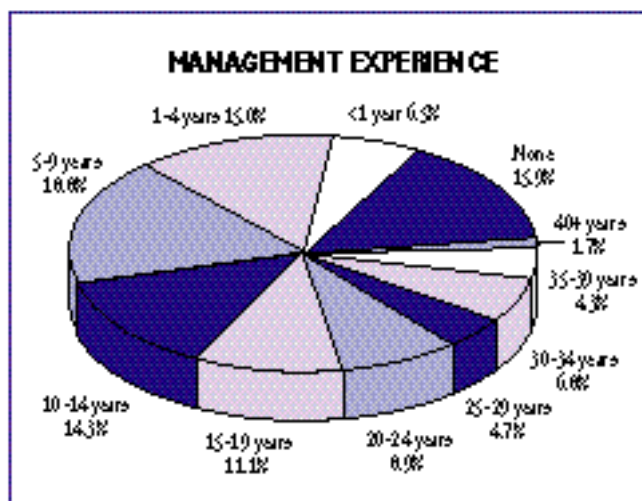
* Income is defined as base salary plus earnings from bonuses, commissions, and other sources. Monetary units are U.S. dollars.



1. Distribution of income, 1990-95



2. Industry experience



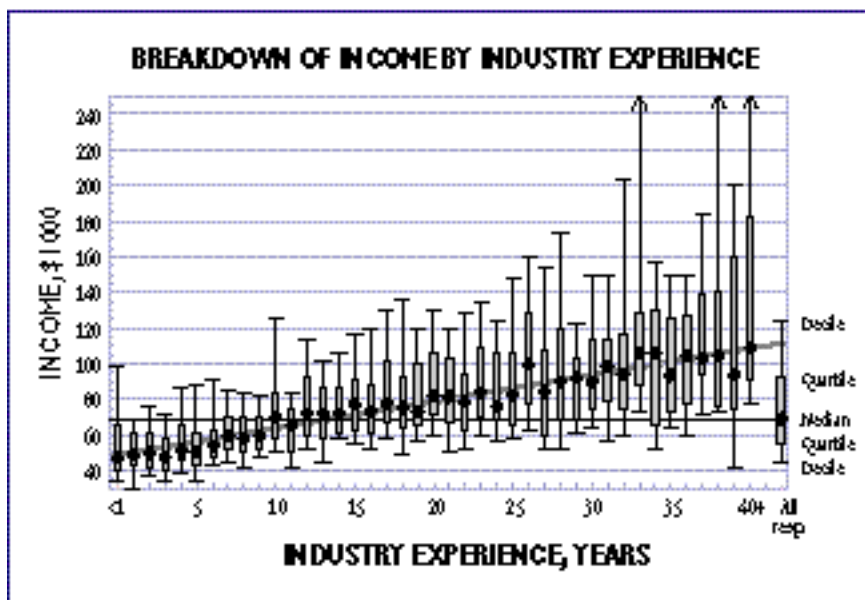
4. Management experience

median represents an erosion of \$2000 in 1994 dollars. In terms of purchasing power, median income actually declined by 3% between 1990 and 1994. However, the jump in median income for 1995 has eliminated this gap, restoring the median to the same level as 1990.

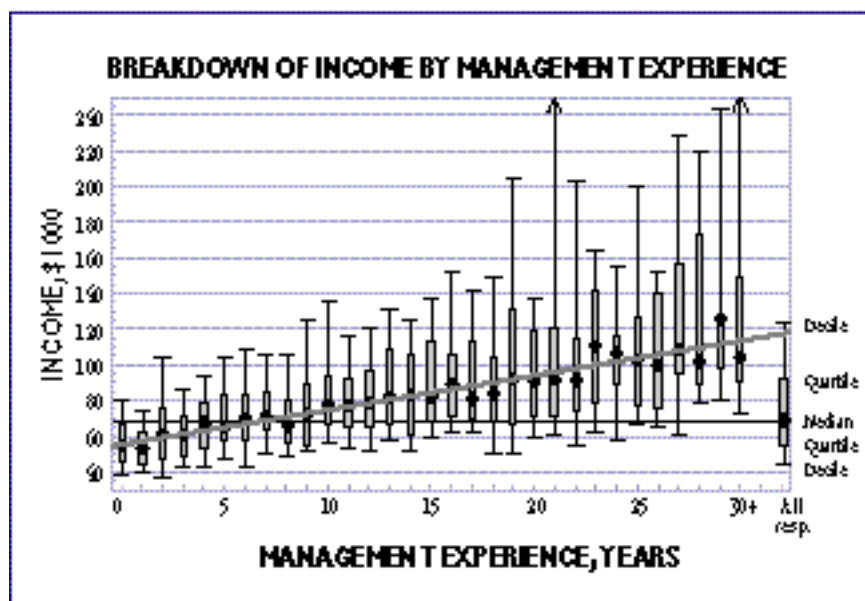
THE SURVEY

The response rate for this year's survey was once again about 30%, with 2221 members completing a slimmed-down questionnaire. We pared the survey questionnaire from 27 items to 18, eliminating nine questions that were irrelevant to the discussion of income. The only other

change in this year's questionnaire was the expansion of categories for company sales, a revision that was long overdue. The old survey provided five categories for sales ranging from under \$100 million to over \$2 billion. The revised question retains the framework of five categories, but the upper limit for sales



3. Breakdown of income by industry experience



5. Breakdown of income by management experience

was raised to \$7 billion to reflect the effects of inflation and expansion in the past decade.

The sheer size of the database is an important factor in any statistical analysis, since a large sample mutes the effects of anomalous responses. However, the size of the database is meaningless unless it represents a random sample of the population. We verified the integrity of the data-

base by comparing key demographic characteristics with results from previous years. Perhaps the most important of these is the age distribution of the respondents. Because age is the most potent predictor of income, any shift in this demographic would have a huge impact on the results. The age distribution for this year's survey was the same as it has been for the past seven years.

INCOME DISTRIBUTIONS

Figure 1 shows the distributions of income for all respondents since 1990. The three curves depict the income distributions for 1990, 1994, and 1995. The most striking feature of the 1995 curve is the increase in the percentage of respondents earning \$90,000 or more. At the high end of the curve, the percentage of respondents earning more than \$130,000 jumped 40%, surpassing the peak in 1992, the last year when median income grew faster than inflation. One out of five respondents (20.7%) earned \$100,000 or more, up from 15.6% in 1994. Fewer than one in five respondents (16.3%) earned less than \$50,000, compared with 20.4% in 1994.

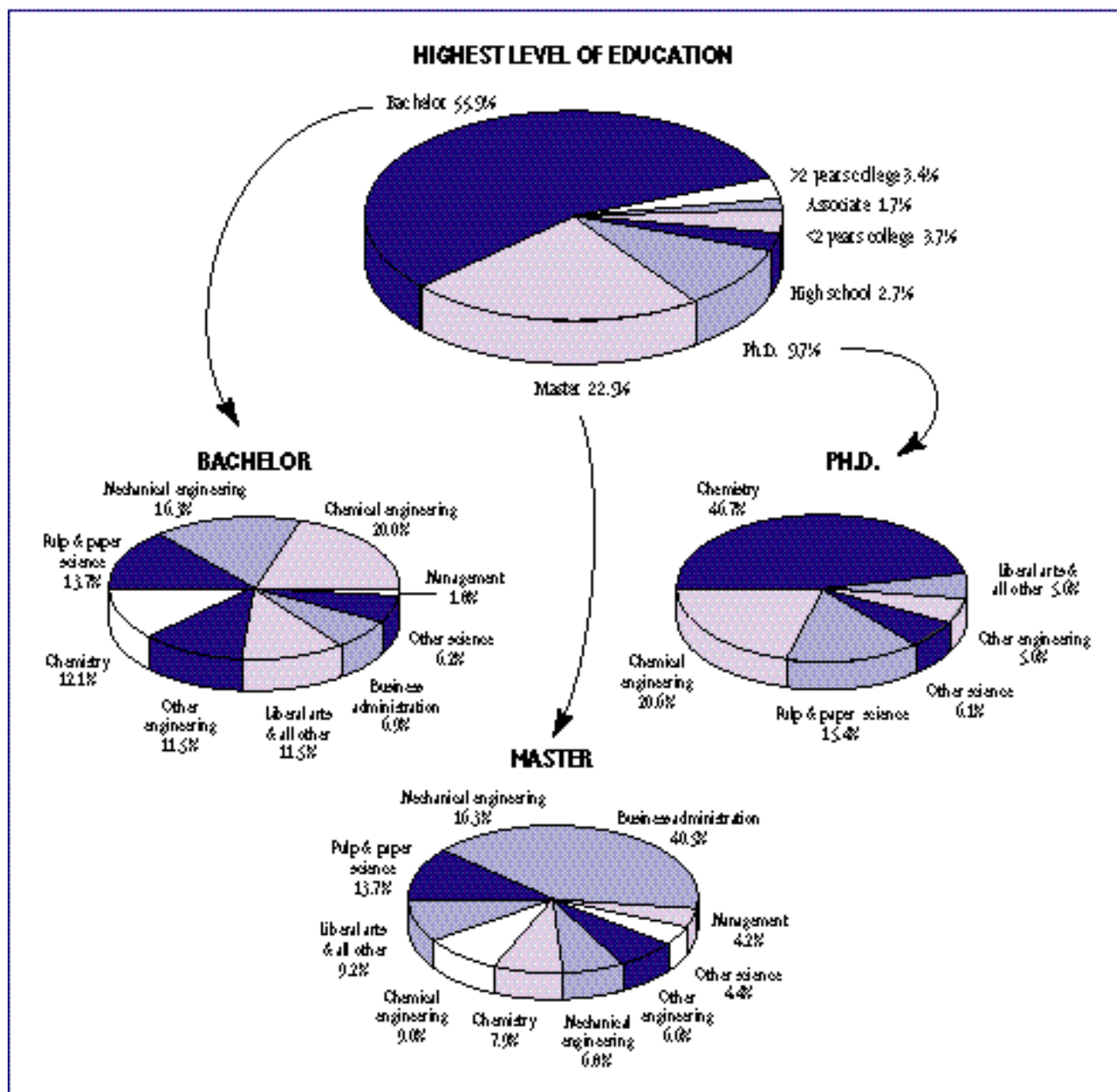
INCOME AND EXPERIENCE

Industry experience

Figure 2 is a pie chart showing the breakdown of industry experience for the TAPPI membership. The median for industry experience was 15 years, the same as last year. While the pie chart groups respondents in five-year age bands, the survey asked respondents to specifically state their years of experience. This makes it possible to examine the relationship between income and industry experience in greater detail.

Figure 3 is a quantile plot showing the growth of income with industry experience. The diagonal line running through the medians represents the best fit through these data points. Judging from the slope of this line, median income increases by about \$1500 with each year of industry experience. At this rate of growth, it takes 14 years before this best-fit line intersects the industry median of \$70,000.

The best-fit line through the medians suggests that the entry-level income in 1995 was about \$47,500. However, more than half of the respondents reporting less than one



6. Highest level of education and fields of study at each level

year of experience are typically 30–60 years old. This explains the high upper decile in Fig. 3 for respondents with less than one year of experience.

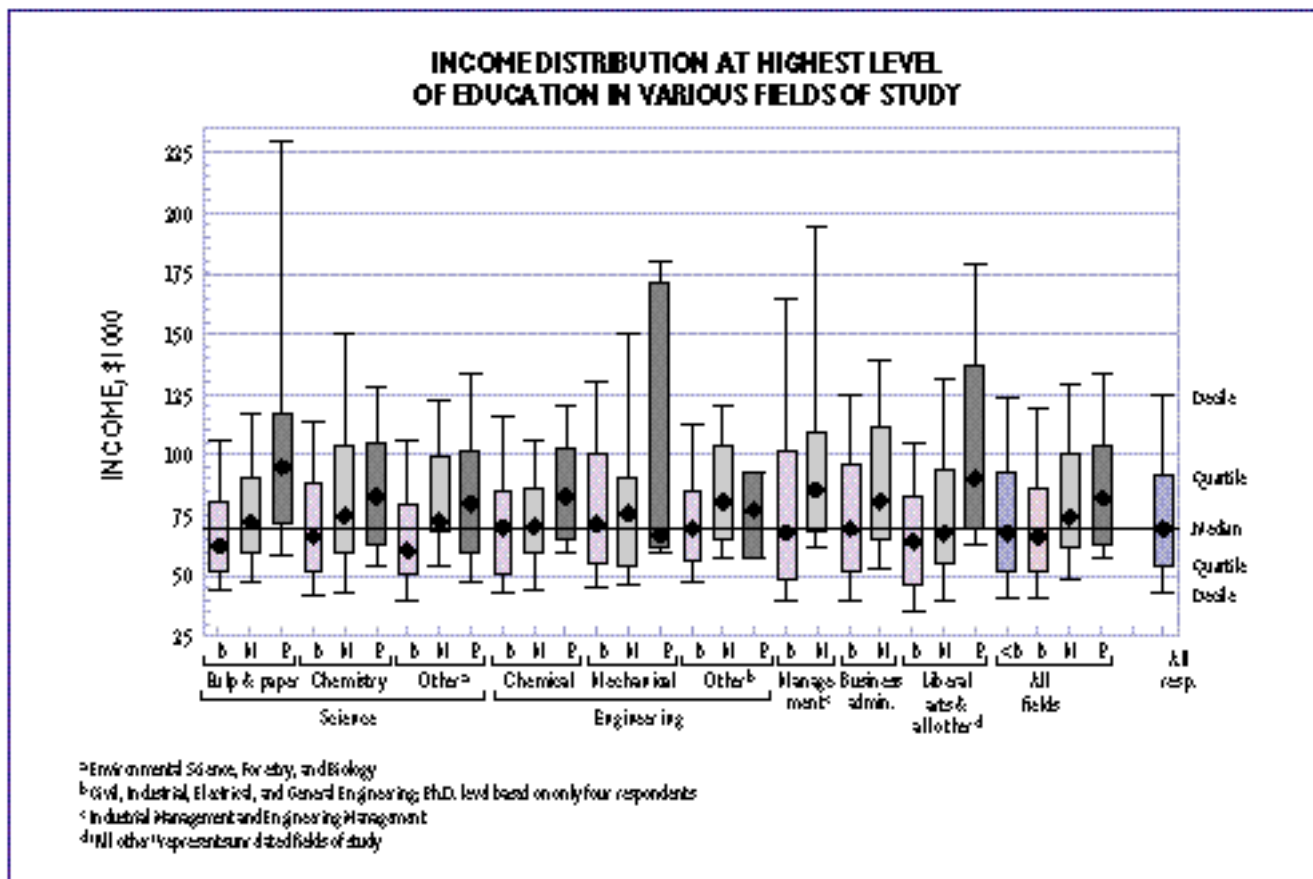
We isolate new hires by shrinking the database to people in their 20s who have been with their current employer for less than one year and who report less than one year of industry experience and manage-

ment experience. This left us with a sample of 22 respondents—13 men and nine women—with a median income of \$42,000, up 5% from \$40,000 in 1994.

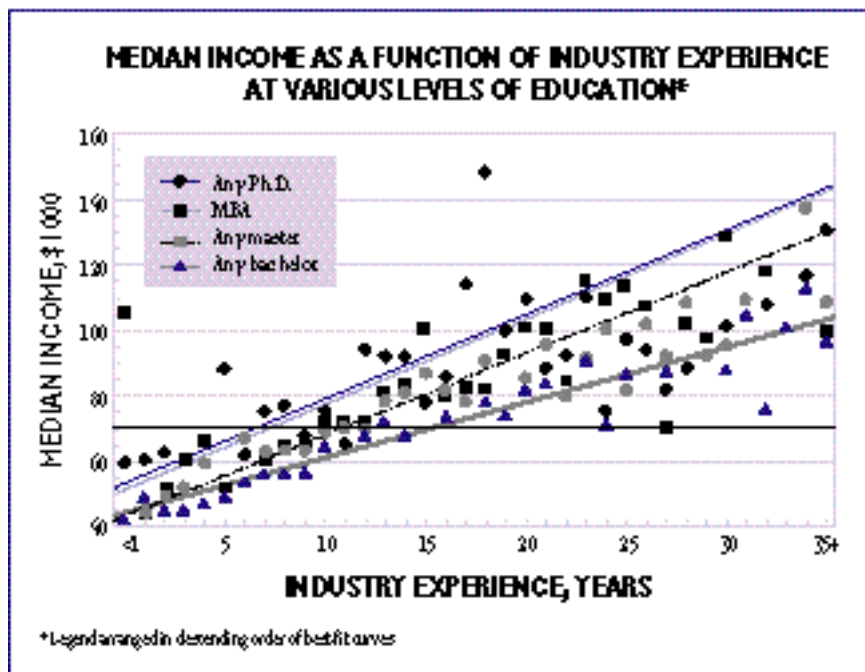
Management experience

Figure 4 is a pie chart showing the breakdown of management experience within the TAPPI membership. The median was seven years, the same as 1994.

Figure 5 is a quantile plot illustrating the effect of management experience on income. The best-fit line through the medians has a steeper slope than the line in Fig. 3 for industry experience, highlighting the potency of this variable. Each year of management experience translates to an increase of about \$2000 in median income, compared with \$1500 for simple industry



7. Income distribution at highest level of education in various fields of study



8. Median income as a function of industry experience at highest level of education

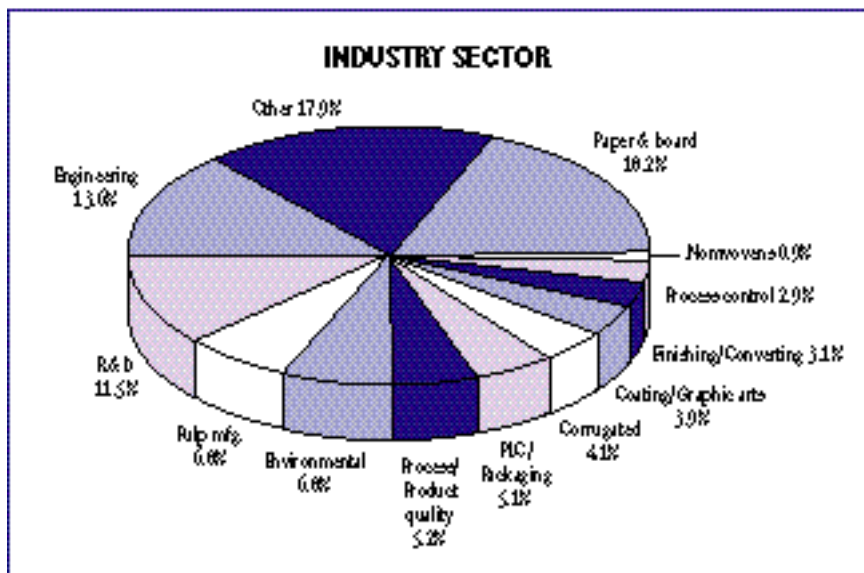
experience. Moreover, the best-fit line intersects the overall industry median of \$70,000 after seven years, compared with 14 years for industry experience.

Bear in mind, though, that the definition of management experience is somewhat subjective. The salary-survey questionnaire implies a link between management experience and the level of supervisory responsibility. Respondents are asked to state their level of responsibility and then asked to list the number of years of management experience. At first glance, the rough agreement between the proportion of respondents reporting no management experience (15.8%) and those reporting no supervisory experience (18.5%) would seem to confirm a linkage between the two concepts. However, a closer look at the

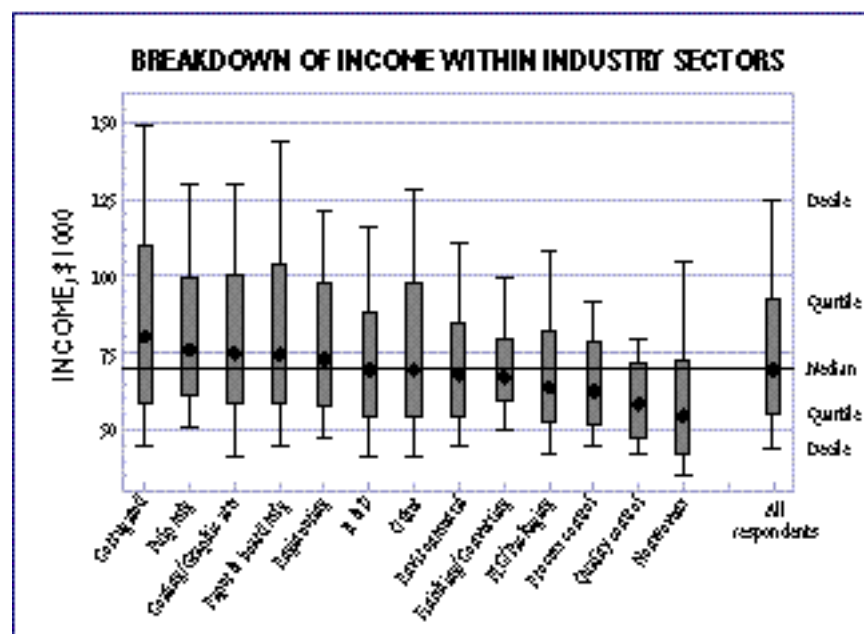
numbers revealed that many respondents reject the notion that management experience involves supervisory responsibility. A large proportion of respondents, almost 20%, reported that they had no supervisory responsibility, but most of this group (almost 60%) also claimed to have management experience ranging from less than one year to 40 years, with a median figure of six years. This group consisted chiefly of marketing and technical personnel, followed by consultants, engineers, and researchers. Workers in these fields are often involved in collaborative projects not directly related to daily production. Such workers might view supervisory responsibility as an irrelevant concept outside the strict confines of a production setting. At the same time, the complexity and importance of their jobs might compel them to include such activities under the umbrella of "management," especially if they view the industry in terms of production-related activities and management activities. The point here is that, because the survey does not rigidly define the concept of management experience, it is open to interpretation and thus is a less reliable predictor of income than industry experience. Indeed, of the four strongest predictors of income—age, experience, supervisory responsibility, and management experience—the latter category shows the weakest correlation. In contrast, the precisely defined categories of age and industry experience show much higher correlations with income.

INCOME AND EDUCATION

Figure 6 shows the overall educational makeup of the TAPPI membership and breaks down each of the three educational levels (Ph.D., master, bachelor) into the major



9. Industry sector

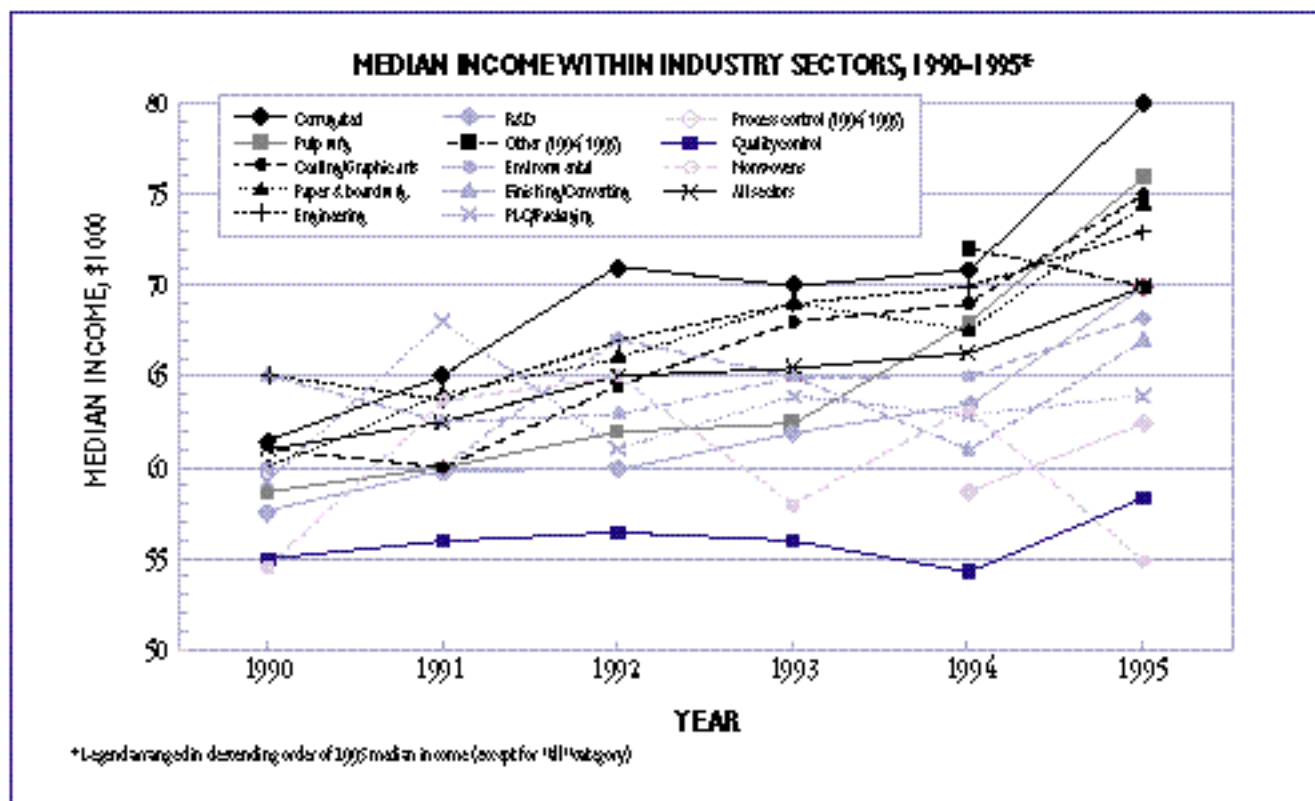


10. Breakdown of income within industry sectors

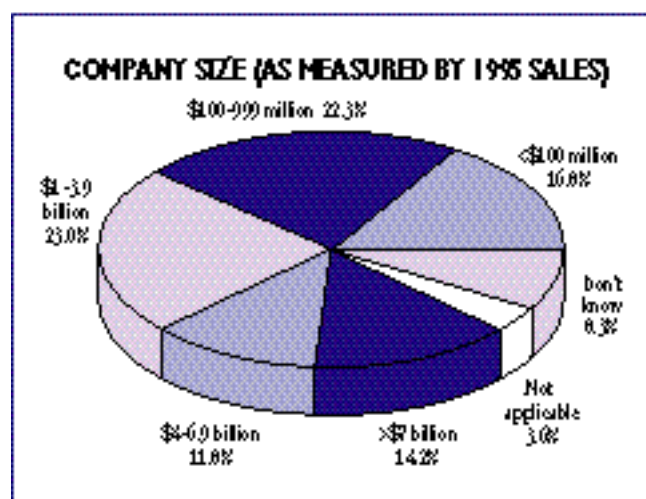
fields of study. The breakdown for Ph.D., master, and bachelor has been stable for many years at 10%, 22.5%, and 57.5%, respectively. At the Ph.D. level, chemistry and chemical engineering continue to be the dominant fields of study. The master level again is overwhelmingly populated by MBAs, with pulp and paper science a distant second. At the bachelor level, chemical engineering remains the

top choice, followed by mechanical engineering, pulp and paper science, and chemistry.

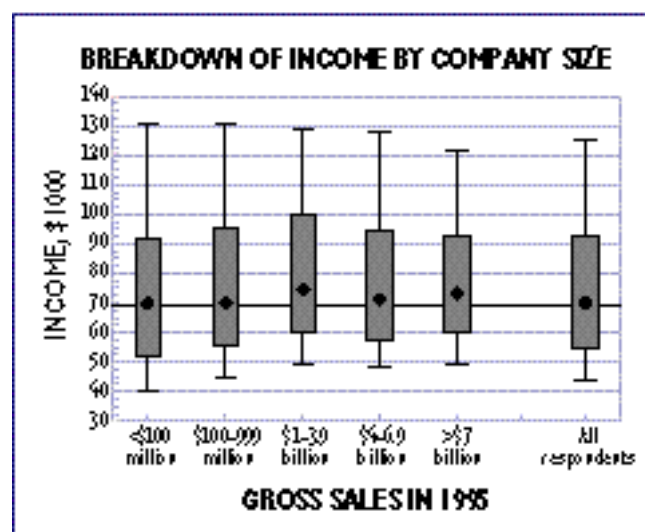
Figure 7 is a quantile plot showing distribution within the major fields of study at the bachelor, master, and Ph.D. levels. The data in this figure are based on the *highest* level of education reported by each respondent. Thus bachelors and masters degrees reported by some-



11. Median income within industry sectors, 1990-95*



12. Company size (as measured by 1995 sales)



13. Breakdown of income by company size

one with a Ph.D. are not included in this figure. A respondent with an MBA and a masters degree in chemical engineering would be included in both columns.

For the third year in a row, pulp and paper science at the Ph.D. level had the highest median income. This year it was \$92,000, up 15% over last year's median of \$80,000.

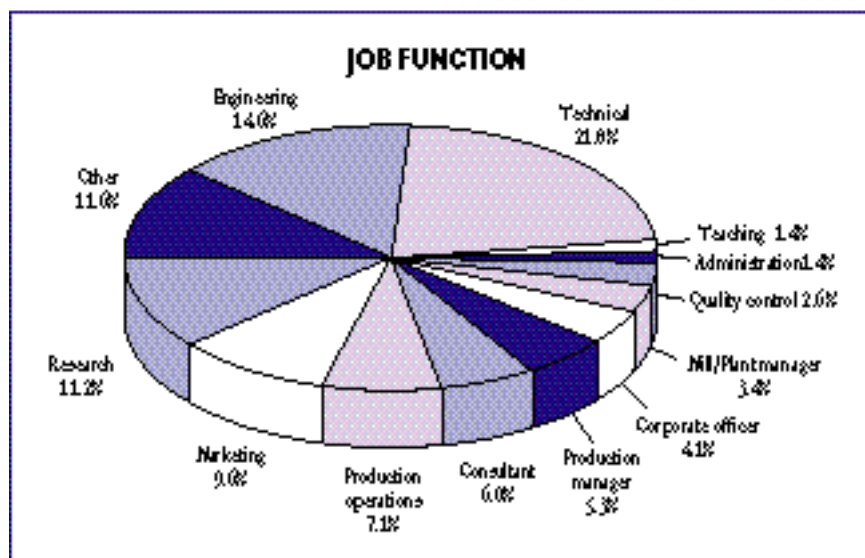
The median for all Ph.D.s increased 5.8% to \$82,000. Last year, the highest median income at the masters level went to MBAs, but this year they were surpassed by the "manage-

ment" category, which includes industrial management and engineering management. Median income for MBAs increased 6.5% to \$82,000, well shy of the \$86,000 median for industrial/engineering management.

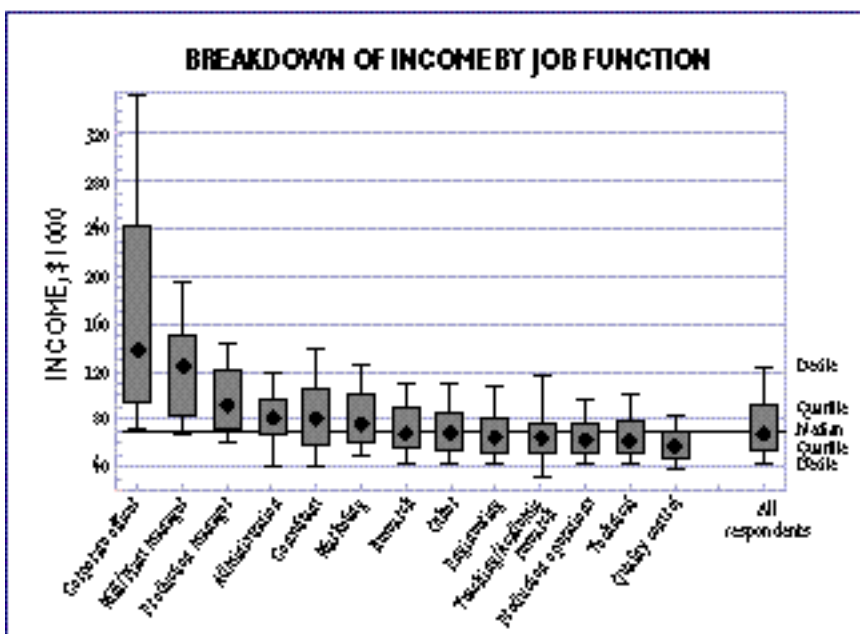
The field of pulp and paper science has shown an interesting but perplexing trend for the past three years. Those with a Ph.D. in this field are among the most highly paid individuals in the industry, but median income at the master level and especially at the bachelor level tends to be lower than for other fields of study.

In most cases, median income shows an orderly increase with increasing level of education. The two exceptions are the medians for Ph.D.s in mechanical engineering and other engineering, where the medians dip below those for a masters degree in the same field. However, the Ph.D. figures for these two fields are based on unreliaibly small samples of eight respondents and three respondents, respectively.

Figure 8 tracks median income as a function of industry experience for all Ph.D., master, and bachelor degrees. Again, this figure is based on the highest level of education reported by each respondent. This approach provides a clearer view of the trends at the master and bachelor levels, since inclusion of lesser degrees earned by Ph.D.s and masters would inflate the medians at the lower levels of education. The figure shows that Ph.D.s enjoy the highest median income, barely edging out MBAs. The best-fit line for "any master" degree begins at about the same level as "any bachelor," but the gap between the two rapidly increases with industry experience. Interestingly, the rate of change for the Ph.D. and master categories is about the same, \$2500 per year of industry experience. The rate of change at the



14. Job function



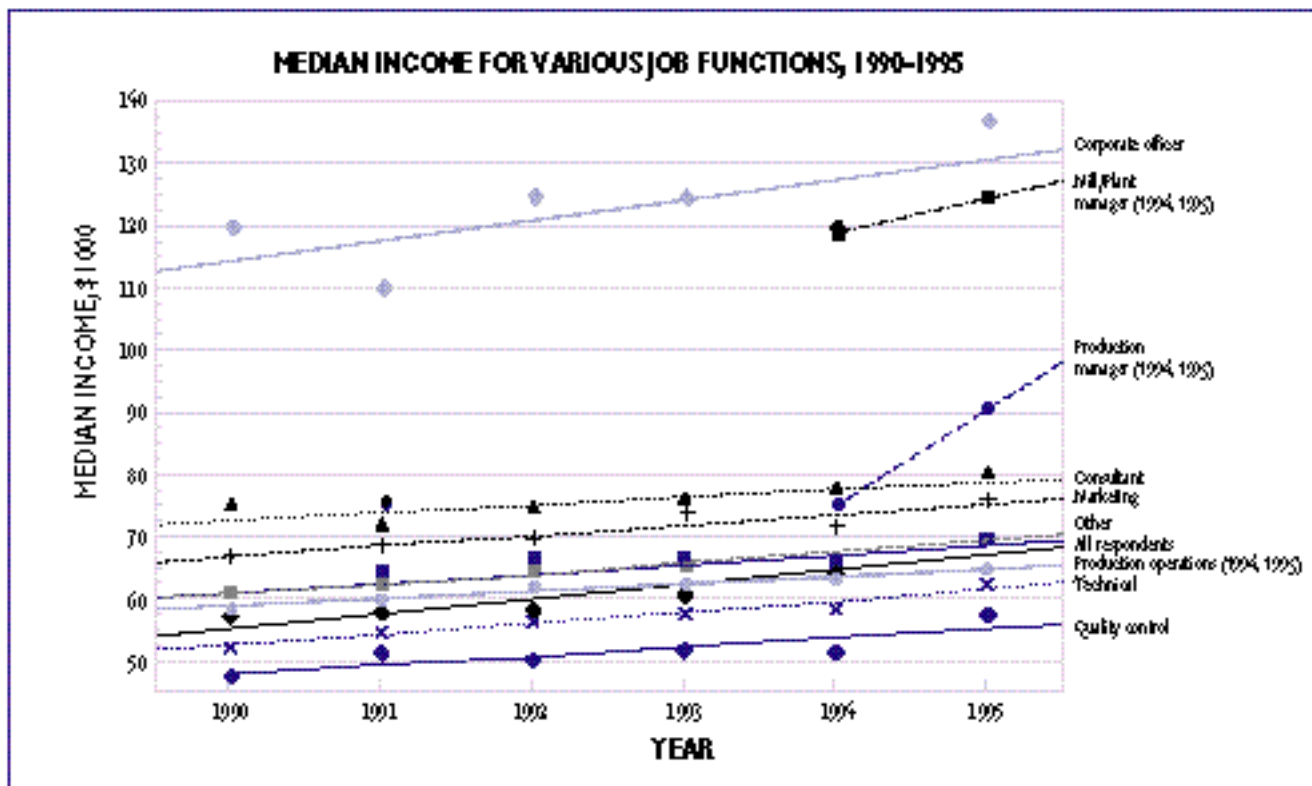
15. Breakdown of income by job function

bachelor level is much smaller, about \$1600 per year. One useful test to illustrate the differences in earning potential among the educational levels is to see where the best-fit lines intersect the horizontal line depicting median income for all respondents (\$70,000). The line for all Ph.D.s intersects the overall median at the six-year mark, while the lines for masters and bachelors degrees

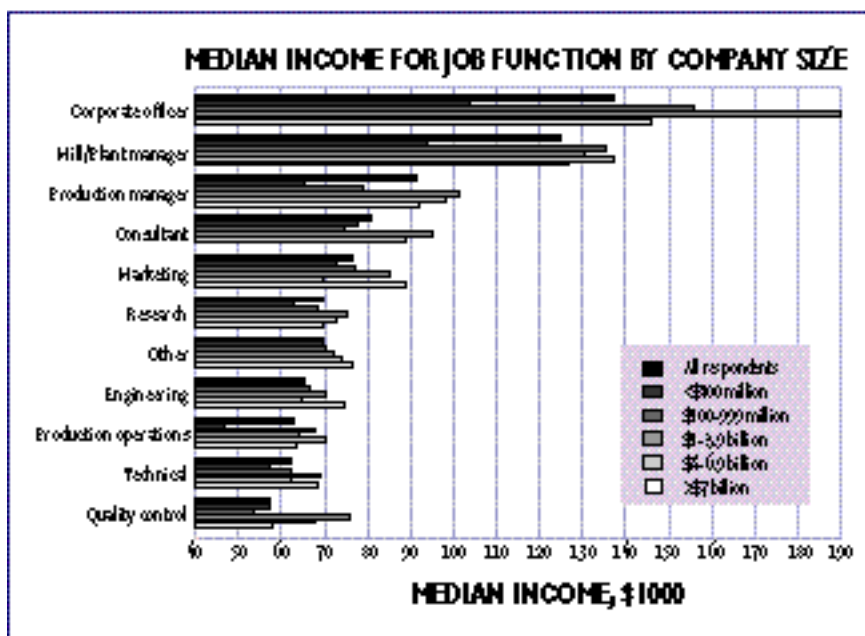
cross this threshold at 10 years and 15 years, respectively.

INCOME IN INDUSTRY SECTORS

The pie chart in **Fig. 9** breaks the TAPPI membership into 13 industry sectors. The figures are almost identical to last year's, signifying both the stability of the membership and the random distribution of survey ques-



16. Median income for various job functions, 1990-95



17. Median incomes for job functions by company size

tionnaires among this diverse population.

Figure 10 is a quantile plot of income distribution within the vari-

ous industry sectors. In contrast to the stable results in the pie chart, median income in the different sectors showed a great deal of volatility.

Corrugated jumped to its customary position at the top of the list, supplanting the "other" category, which tumbled to the seventh position. Pulp manufacturing and paper/board manufacturing leapfrogged to second and fourth place, respectively, after languishing at the fourth and sixth positions in 1994. The big loser was nonwovens, which dropped from ninth place to the bottom of the list, forcing quality control to surrender its lock on last place.

With so much change between 1994 and 1995, we decided to track the medians in each sector from 1990 to 1995. Figure 11 shows the results. The most salient aspect of this figure—apparent even before attempting to untangle the spaghetti of 14 curves—is the widening gap in median income between the top and bottom sectors. Between 1990 and 1995, the initial gap of \$10,000 has grown to a chasm of \$25,000. Factoring in the 14.7% rate of inflation

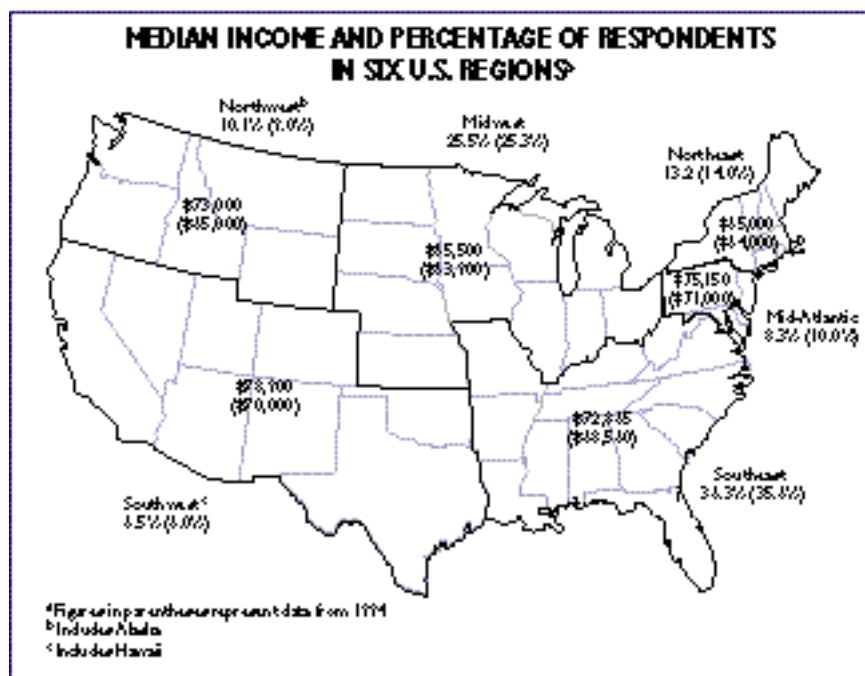
from 1990 to 1995, one would expect the gap to have increased by only \$1500 to \$11,500. The current state signals either a fundamental shift in the industry, a flaw in our analysis, or a big correction in 1996.

Pulp manufacturing showed the most impressive growth, starting near the bottom of the pack in 1990 and emerging at the number-two spot in 1995 after two successive years of explosive growth. The most volatile sector is nonwovens, which started out at the bottom of the heap in 1990, jumped to fourth place in 1991, held steady in 1992, tumbled steeply in 1993, rebounded in 1994, and finally dropped to last place in 1995 at the same median income as 1990. The PLC (polymers, laminations, and coatings) sector showed the same roller-coaster tendencies in the early '90s, but its performance has stabilized since 1992. Quality control, perennially at the bottom of the heap, finally showed a long-overdue advance after five consecutive years of stagnation.

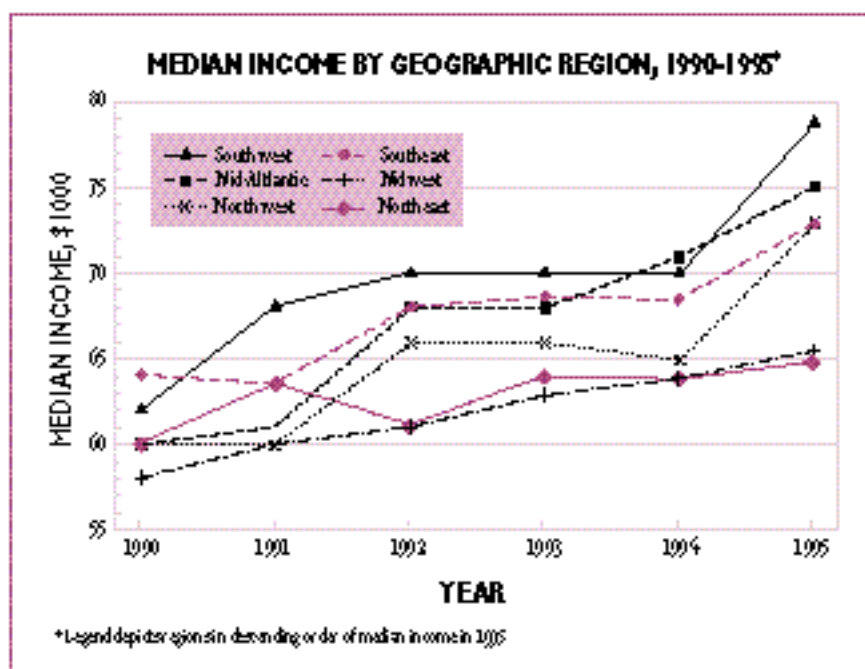
INCOME AND COMPANY SIZE

Figure 12 is a pie chart showing the breakdown of the TAPPI membership according to company size as measured by annual sales. We have ignored this category in the past few years because correlation tables show that it has only a modest effect on median income. However, while the effect is modest, it is not negligible. Moreover, the effect of this category was masked by our failure to update the categories to account for the effects of inflation on annual sales. This year's survey expanded the categories to reflect today's prices.

The chart shows that about 40% of the membership works in companies with less than \$1 billion in sales. Another 35% work for medium-sized companies with sales of \$1-7 billion dollars, and only 14% work for com-



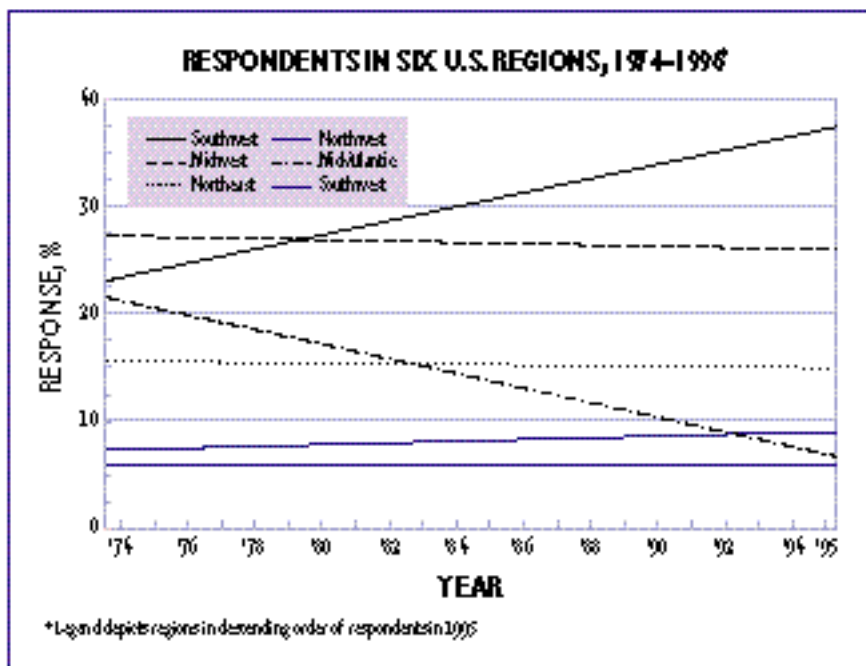
18. Median income and percentage of respondents in six U.S. regions*



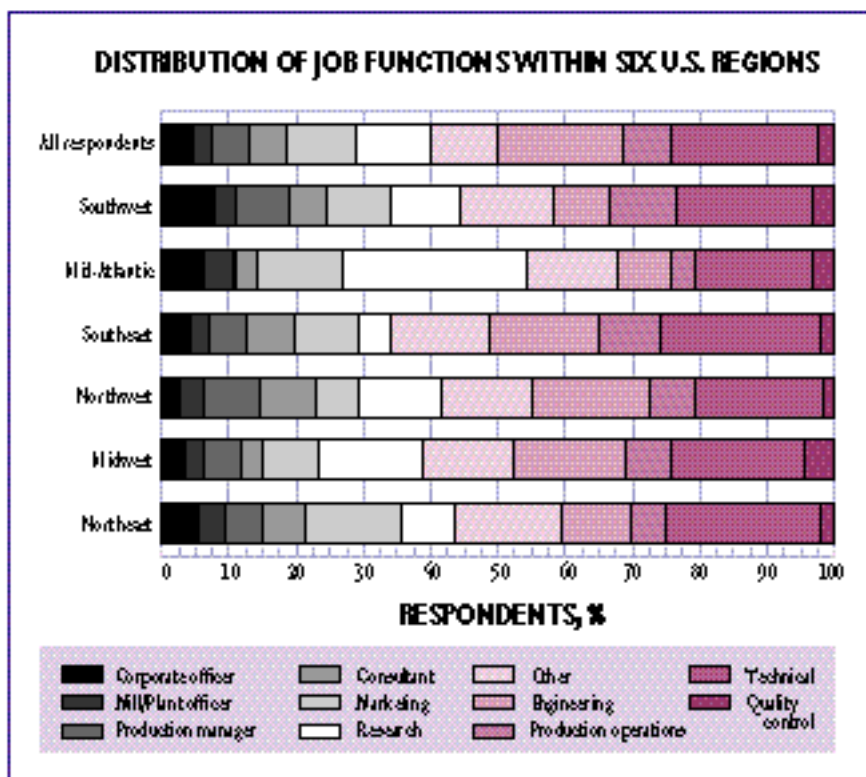
19. Median income by geographic region, 1990-95*

panies with sales exceeding \$7 billion. **Figure 13** is a quantile plot showing the income distribution in the five categories of company sales. Companies with sales of \$1-3.9 billion show the most favorable profile,

with a higher median and upper and lower quartiles than the other categories. Median income in the largest companies, those with sales exceeding \$7 billion, was higher than the industrywide median, but the range



20. Respondents in six U.S. regions, 1974-96*



21. Distribution of job functions within six U.S. regions

of salaries is more tightly controlled, as evidenced by the narrower range

for the upper and lower quartiles and deciles.

The chart does not include figures for the 8.3% of respondents who reported that they did not know their company's sales for 1995, but the median income for this group was \$54,300, well below the lowest median income of \$70,000 for respondents who knew their company size. This suggests that knowledge of a company's annual sales increases median income by at least \$15,000. More importantly, it demonstrates that statistical analysis can lead to fatuous conclusions in the absence of common sense.

INCOME AND JOB FUNCTION

Figure 14 shows the breakdown of job functions within the TAPPI membership. The accompanying chart in Fig. 15 is a quantile plot showing income distribution within these job functions.

All job functions, with the exception of teaching, showed an increase in median income for 1995. (Teaching dropped by 0.7% to \$65,000.) Increases ranged from 3.3% for engineering to 20.7% for production managers. Median income for corporate officers increased by 14.5% to \$137,400, the next highest increase after production managers. Quality control remained in last place, but median income jumped by 11.7% to \$57,900, the third highest increase of the listed job functions. Median income for research also saw a healthy increase of 9.4% to \$70,000.

Figure 16 tracks the change in median income for all of the job functions since 1990. Median income for all respondents increased from \$61,000 in 1990 to \$70,000 in 1995. This growth of 14.7% exactly matches the rate of inflation during this same time span, so the lines with steeper slopes represent job functions that have netted real gains over the past six years. The biggest winners have been corporate officers and researchers. Indeed, the rate of

growth for income at the corporate level indicates that the gap between this job function and the rest of the pack will continue to widen. The consultant, technical, quality-control functions showed slight gains, as did three new categories—mill manager, production manager, and production operations. However, the results for the new categories are based on only two years of data. The other functions either held steady (marketing, other) or lost ground (engineering).

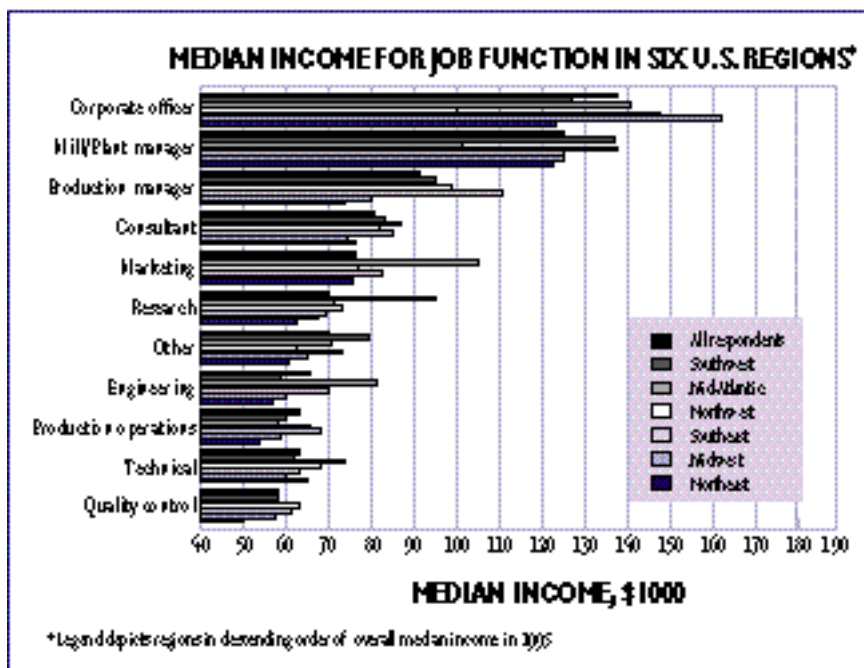
Figure 17 shows the median income for 11 job functions in the five categories for company size. The results indicate that median income for almost all job functions is lowest for small companies with sales of less than \$100 million. A substantial 16.8% of the membership works for such companies. The drop is particularly severe for the job functions with the highest incomes.

INCOME IN SIX U.S. REGIONS

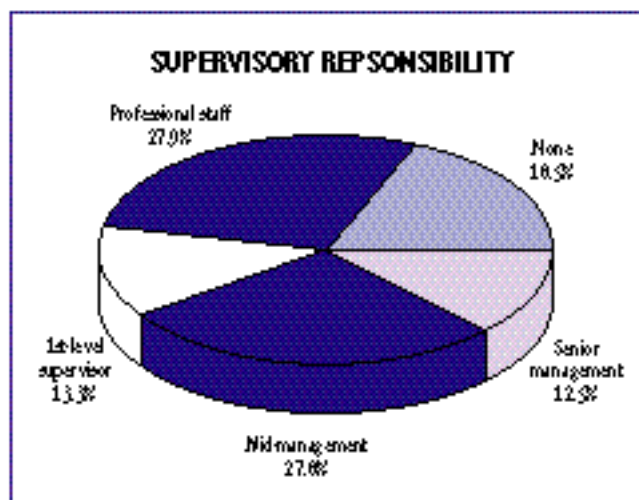
The map in **Fig. 18** shows the median income and the distribution of respondents in six U.S. regions for 1994 and 1995. All six regions reported an increase in the median income, as seen in **Fig. 19**, which tracks median income in the six regions since 1990. The increases were particularly steep in the southwestern and northwestern regions, where incomes had remained flat for three years. The southeastern and Mid-Atlantic regions also showed substantial increases in income, and the Mid-Atlantic is the only region that showed a significant increase in 1994, when pulp prices spiralled upward. Median income in the Midwest and in the northeastern region showed a modest gain.

The percentage of respondents in each region has been fairly steady for the past seven years, but a review of the results dating back to the first salary survey in 1974 shows a substantial shift in the percentage of respondents in two regions. **Figure 20** shows that membership in the Mid-Atlantic region has declined precipitously over the past two decades while the southeastern has ascended to the top position. The northeastern region has held steady, and membership in the Midwest has dropped somewhat. The population of TAPPI members in the northwestern and southwestern regions has increased slightly since 1974.

Given the differences in median income and respondents in each region, it would be reasonable to surmise

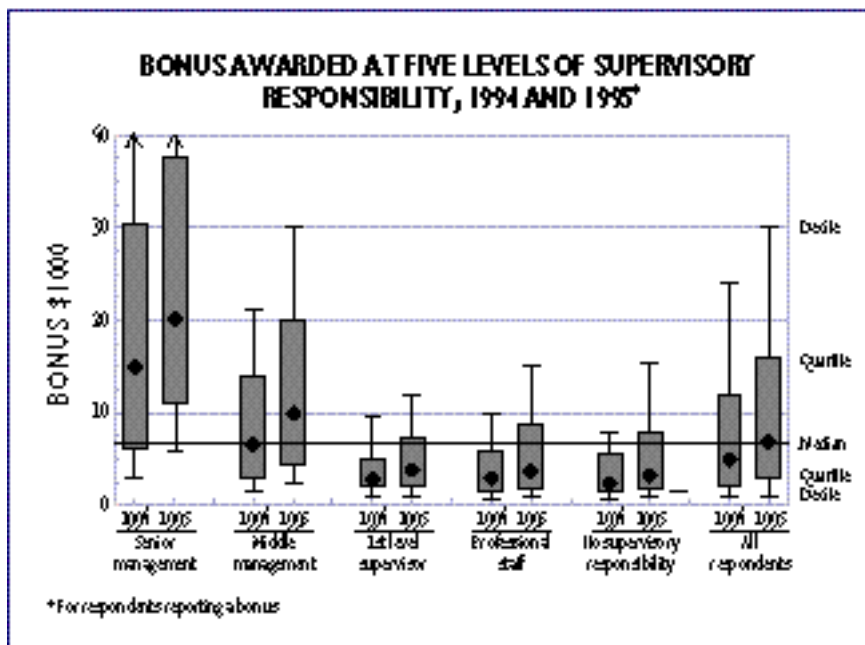


22. Median income for job functions in six U.S. regions

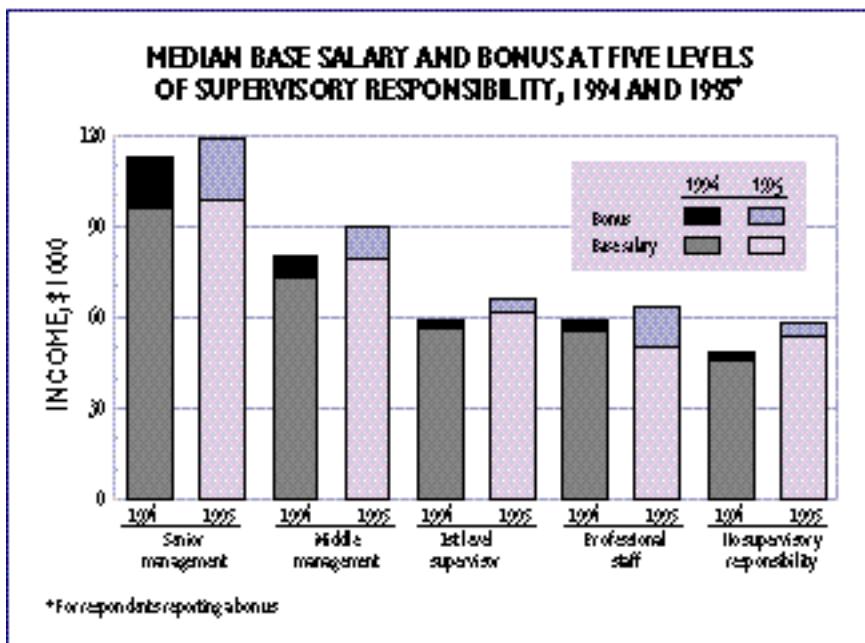


23. Supervisory responsibility

that there might be a different mix of job functions among the six regions. We tested this proposition by charting the distribution of job functions within each region. **Figure 21** shows significant differences in the mix of jobs. In particular, the Mid-Atlantic has the smallest percentage of production managers and consultants and the largest percentage of researchers and marketing people. The southwestern region, which typically has the highest median income, has the largest combined percentage for the top three income producers: corporate officers, mill managers, and production managers.



24. Bonus awarded at five levels of supervisory responsibility, 1994 and 1995*



25. Median base salary and bonus at five levels of supervisory responsibility, 1994 and 1995

Figure 22 shows the median income for the 11 job functions in the six U.S. regions. A review of the data in this figure reveals some interesting trends. For example, median income for corporate officers is highest in the Midwest and lowest in

the northwestern region. On the other hand, production managers do better in the southeastern region. Median income for marketing in the Mid-Atlantic region is more than \$20,000 higher than the nearest competitor, while income for

researchers appears to be highest in the southwestern region.

BONUSES

Last year we began gathering detailed information about bonuses for the first time. In-depth analysis of this topic is not yet possible with such a limited database, but there are several trends worth noting.

In 1994, 44% of the respondents reported receiving a bonus. The median value was \$5000. The median bonus for 1995 jumped to \$7000, an increase of 40%, and the proportion of respondents reporting a bonus increased to 50.4%.

The variable that correlates most highly with bonuses is the level of supervisory responsibility. Figure 23 is a pie chart showing the breakdown of supervisory responsibility within the TAPPI membership. The category with the highest percentage of respondents reporting bonuses was senior management, where 70% said they received bonuses, up from 58.3% in 1994. The proportion of bonuses for middle management increased slightly from 51.5% in 1994 to 56.3% in 1995. Bonuses for the other three categories also increased from about 35% in 1994 to about 43% in 1995.

The quantile plot in Figure 24 shows the bonuses awarded at five levels of supervisory responsibility for 1994 and 1995. Bonuses at all levels increased, but the biggest increase in absolute and relative terms went to senior management. Figure 25 shows the median base salary and bonuses for 1994 and 1995 in the same five categories. It is interesting to note that base salary increased from 1994 to 1995 in every category but senior management, where income growth was almost entirely attributable to the larger bonus, which increased 33% to \$20,000. The median bonus for middle managers increased by 50% to \$10,000, while base salary increased by about 8% to \$80,000. First-level

supervisors and professional staff saw an increase of 33% in median bonus to \$4000, with respective increases of 11% and 7% in base salary. Median bonus for workers with no supervisory responsibility increased by 40% to \$3500, while median base salary jumped 17% to \$55,000.

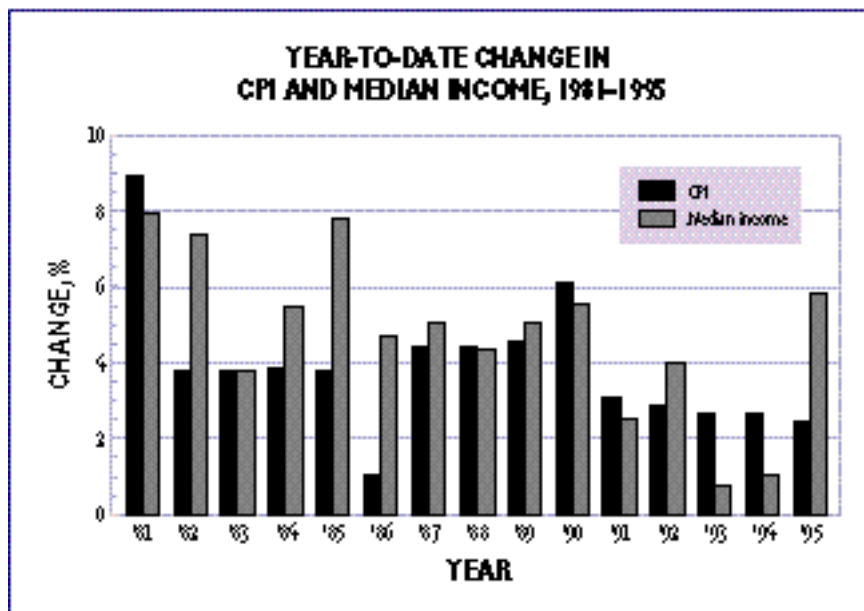
INFLATION AND INCOME

Inflation—like rust—never sleeps. Each year it grows, eating away at our assets and corroding the purchasing power of our incomes. Inflation is compound interest with a negative sign.

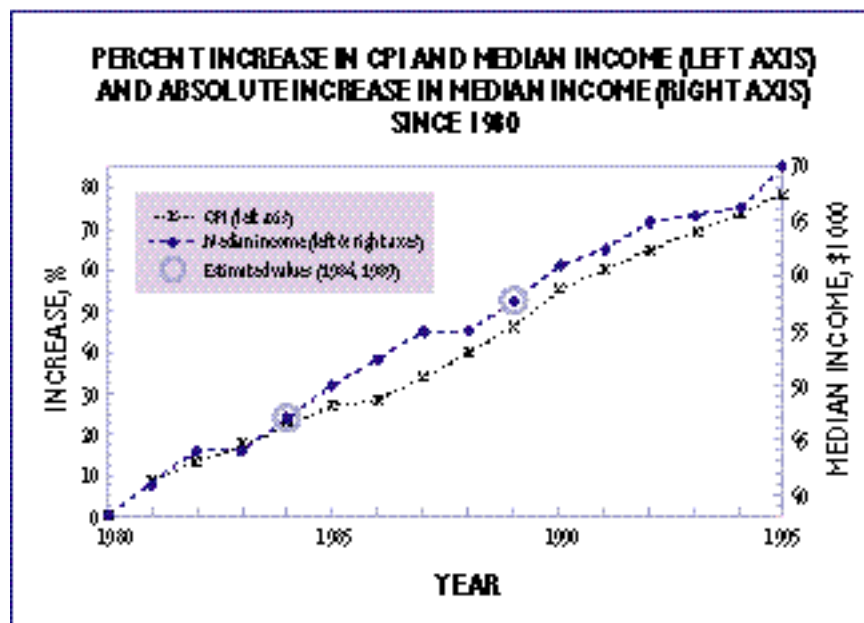
Consumer prices rose 2.5% in 1995, down from 2.7% in 1993 and 1994 and 2.9% in 1991. That makes four consecutive years of inflation below 3%, a phenomenal even considering the fact that inflation has dipped below the 3% mark only five times in the past 30 years. The last time this country saw four consecutive years of inflation below 3% was during the Kennedy and Johnson administrations in 1962–65.

The 5.6% increase in median income is the largest in the past decade. When placed in the context of a 2.5% rate of inflation, this increase is even more impressive. **Figure 26** shows the year-to-year change in the CPI and median income since 1981. The key factor in this figure is the extent by which median income exceeds the CPI in any given year. The chart clearly shows that 1995 ranks among the heady years of the mid-1980s, when income growth outpaced inflation for four consecutive years.

Figure 27 tracks the annual growth in the CPI and TAPPI median income since 1980. Inflation has grown at an annualized rate of 5.2% over this time span. TAPPI median income has outpaced inflation—chiefly through gains made in the mid-1980s—with an annualized growth rate of 5.6%.



26. Year-to-year change in CPI and median income, 1981–95



27. Percent increase in CPI and median income (left axis) and absolute increase in median income (right axis) since 1980

The median income of \$38,000 in 1980 translates to \$67,500 in 1995 dollars after adjusting for inflation. This year's median of \$70,000 thus represents a "bonus" of \$2500 in today's dollars. The 1995 median income represents a 3.7% gain in purchasing power over the 1980 median, which is exactly where it was in 1990. After losing ground to

inflation in four of the last five years, that's a pretty good recovery.

TJ

Burke is a freelance writer specializing in the pulp and paper industry, 1011 Larch Ave., Takoma Park, MD 20912-6520; e-mail to DougBurke1@AOL.com.