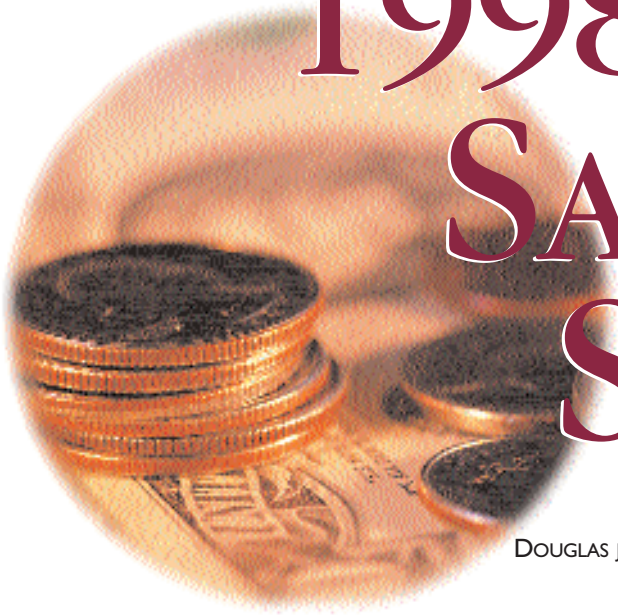
1998 TAPPI Salary Survey



DOUGLAS J. BURKE

AFTER THREE CONSECUTIVE YEARS OF GROWTH, MEDIAN INCOME IN 1998 INCREASED A MERE 1.4% DESPITE A STRONG U.S. ECONOMY AND THE LOWEST INFLATION RATES IN A GENERATION.

Global overcapacity, turmoil in overseas economies, and a strengthening U.S. dollar combined to make 1998 a challenging year for the North American pulp and paper industry. With the economies of Asia, South America, and Russia in crisis, global consumption of forest products dropped. Much of the excess inventory was diverted to the North American market, where a surging U.S. economy absorbed the flood of low-cost imports. North American producers had to cut prices to stay competitive, and many mills curtailed production in the second half of the year as they struggled to balance inventory.

Despite the daunting market conditions, the industry is weathering this latest downturn in the business cycle by reducing capital spending and focusing on production efficiency. Anemic corporate profits in 1998 were reflected in the results of this year's salary survey. Median income* for TAPPI members was flat, increasing by only 1.4% to $78,000. Inflation remained at historic lows, advancing a mere 1.6% in 1998. Still, that was enough to eclipse the meager increase in median income and produce a net loss of 0.2%.

* Income is base salary plus earnings from bonuses, commissions, and other job-related compensation. Monetary units are U.S. dollars.

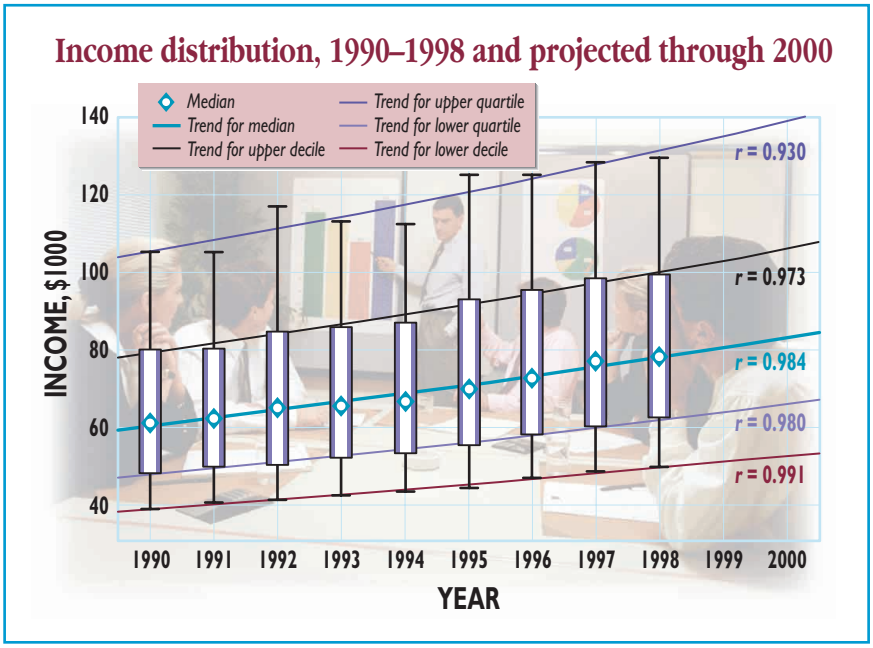
THE SURVEY

TAPPI conducted its first salary survey in 1974. A second survey in 1976 established the practice as a biennial event through 1980. Since then, the survey has become an annual tradition with the exception of 1984, when there was no survey.

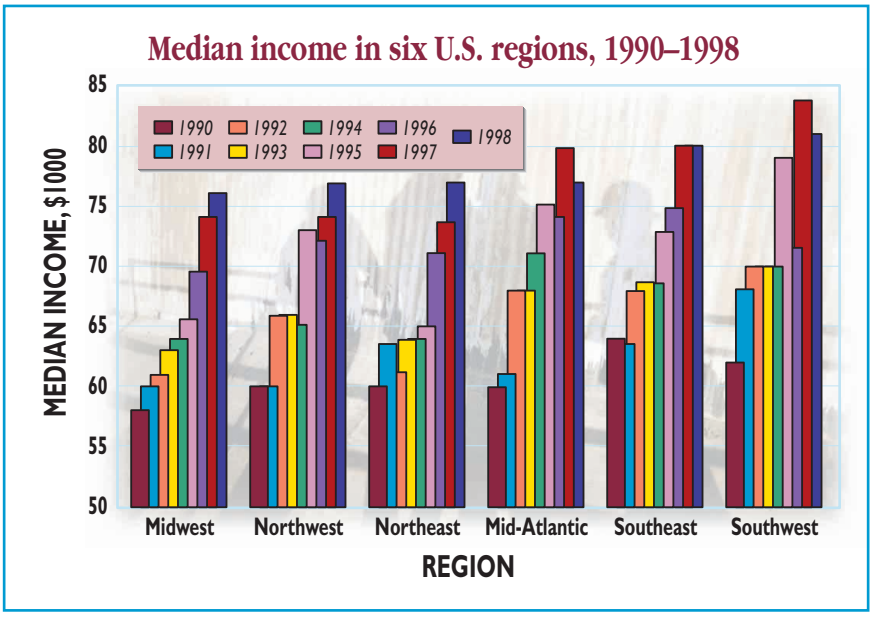
A randomly selected set of 7487 U.S. TAPPI members received a copy of the survey questionnaire early this year. More than 26% were completed and returned before the March 21 deadline, well below last year's response rate of 33%. The survey that follows is based on the information generously provided by these respondents.

INCOME DISTRIBUTIONS

Figure 1 is a quantile plot showing the distribution of income for all respondents since 1990. The T bars represent the upper and lower deciles; the elongated rectangles denote the upper and lower quartiles; and the diamond within each rectangle is the median. For readers whose familiarity with statistical terms is a bit rusty, the median is the central value in a group of data arranged in numerical order, i.e., 50% of the responses (in this case, total reported income) are higher than the median, and



1. Income distribution, 1990–1998 and projected through 2000



2. Median income in six U.S. regions, 1990–1998

50% are lower. Deciles and quartiles are useful measures of "noncentral" location that describe data dispersion on either side of the median. In terms of income, the upper quartile is the dollar amount that separates the top 25% wage earners from the bottom 75%, while the lower quartile is the point that separates the bottom 25% from the top 75%. Thus the rectangle around the median depicts the range of incomes for the middle 50% of the respondents. Similarly, the upper decile marks the boundary for the top 10% of wage earners, while the lower decile is the boundary for the bottom 10%. The range between the upper and lower T bars thus encompasses incomes reported by 80% of the respondents.

The best-fit models for the five trend lines in Fig. 1 are exponential rather than linear. The adjusted correlation coefficient r for each trend line is a measure of the strength of correlation between income and time. Values for r can vary from +1.0 (a perfect positive correlation) to –1.0 (a perfect negative correlation), with r = 0 indicating no correlation. The model for median income shows that it has increased at an annual rate of 3.2% since 1990, which translates to an increase of 29% from 1990 through 1998. Growth rates for the upper decile and upper quartile were 2.8% and 3.0%, respectively. The lower decile grew at an annual rate of 3.0%, while the lower quartile had the highest rate of growth, 3.3%.

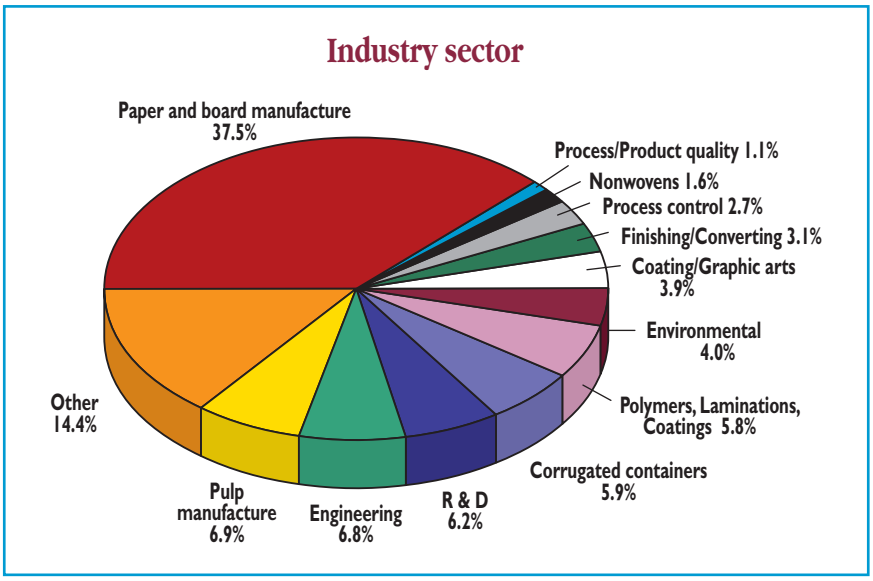
The median income for 1998 was $78,000, an increase of 1.4% over last year's median of $76,906. This increase was well below the modeled trend of 3.2% per year since 1990 and failed to surpass even last year's modest 1.6% rate of inflation, which was at its lowest point in 12 years. Despite the lackluster performance in 1998, income for TAPPI members has clearly outpaced inflation since 1990. The consumer price index (CPI) has increased at an annual rate of 2.6% since 1990 for an overall increase of 23% through 1998. In contrast, median income for TAPPI members has increased by 29% over the same time span.

REGIONAL INCOME

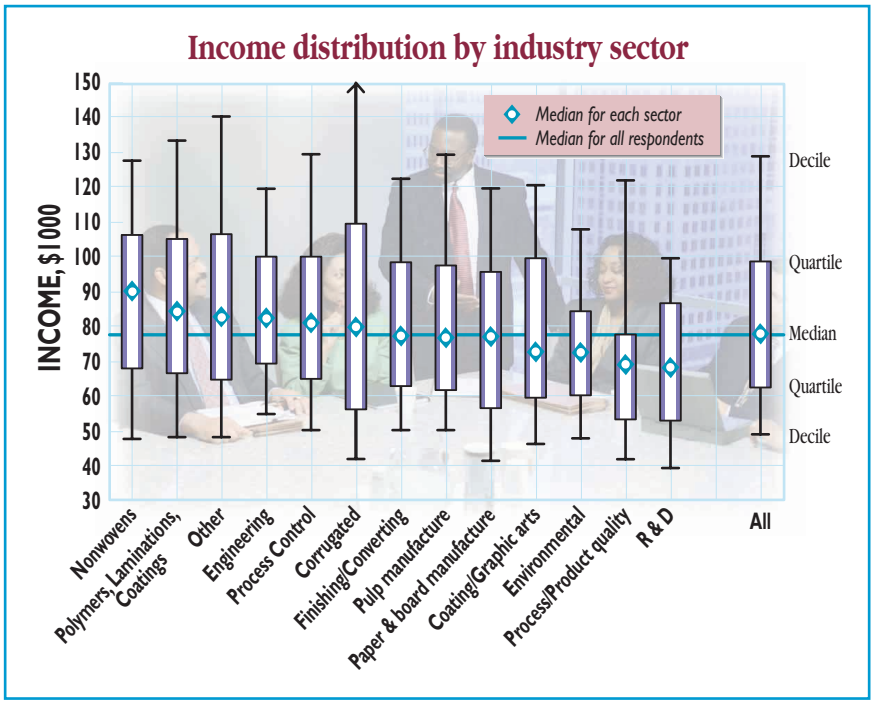
Figure 2 shows median income in the six U.S. regions from 1990 through 1998. Once again, median income was highest in the Southwest, even though the 1998 median was 3.3% less than it was in 1997. The Mid-

Atlantic suffered a 3.4% drop in median income, placing it on a par with the Midwest, Northwest, and Northeast regions, which showed respective increases of 2.7%, 3.9%, and 4.5%. The Southeast held steady, maintaining its position in the number two slot.

The Midwest is the only region where median income has increased every year since 1990. While the Midwest still has the lowest median income of the six regions, it has ascended to parity with the Northwest, Northeast, and Mid-Atlantic regions. Indeed, the results for the past nine years seem to indicate a steady progression toward income parity among the six regions. The disparity between the highest and lowest medians was only 6.6% in 1998, the slimmest gap since 1990.



3. Response rate from 13 industry sectors



4. Income distribution by industry sector

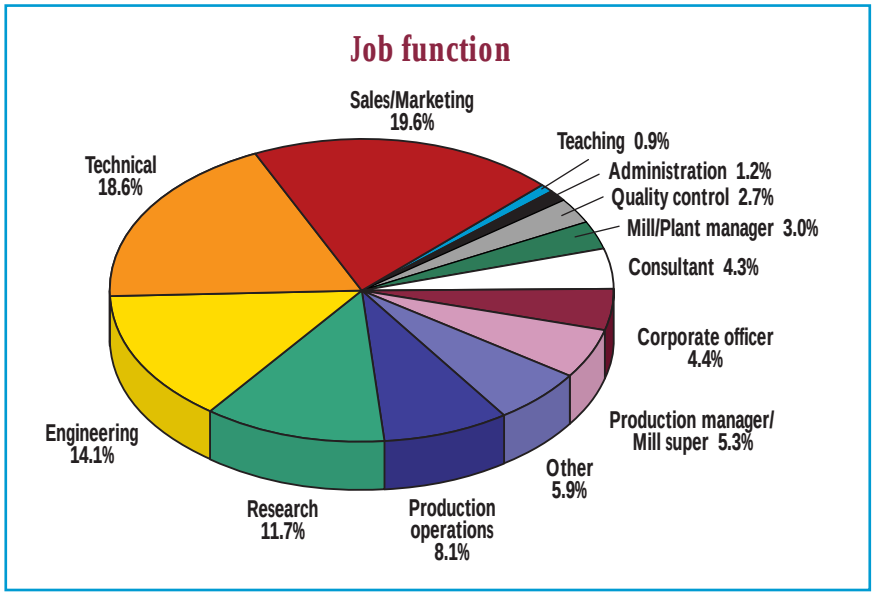
INDUSTRY SECTOR AND INCOME

The pie chart in **Fig. 3** shows the breakdown of the TAPPI membership for the 13 categories of job sector. Three categories-Paper and Board Manufacturing, Other, and Pulp Manufacturing-account for nearly 60% of the respondents. Paper and Board Manufacturing, at 37.5%, was by far the largest of the 13 sectors.

Figure 4 is a quantile plot showing the breakdown of income by industry sector. Median income for Paper and Board Manufacturing, usually among the highest of all the industry sectors, fell to the middle of the pack in 1997 and-for the first time since 1990-its median income fell below the median for all respondents. In 1998, Paper and Board Manufacturing dropped another notch to ninth place, and the median income was once again below the median for all respondents. Pulp Manufacturing jumped a few notches to eighth place, but median income was once again less than the overall median.

Engineering, which is usually among the sector leaders, dropped from first place in 1997 to fourth in 1998. Given the volatility of the rankings from year to year, a shift of two or three positions in either direction is not unusual. However, it was surprising to see Nonwovens rise to the top position from well back in the pack. (Nonwovens ranked last (13th) in 1996 and 10th in 1997.) This unexpected surge may reflect a particularly good year for the nonwovens sector, but it could also be a statistical fluke, since the income data for nonwovens are based on only 30 respondents.

With all the shifting among the various sectors from year to year, it is hard to spot trends. However, a review of data since 1990 shows that the Corrugated sector is



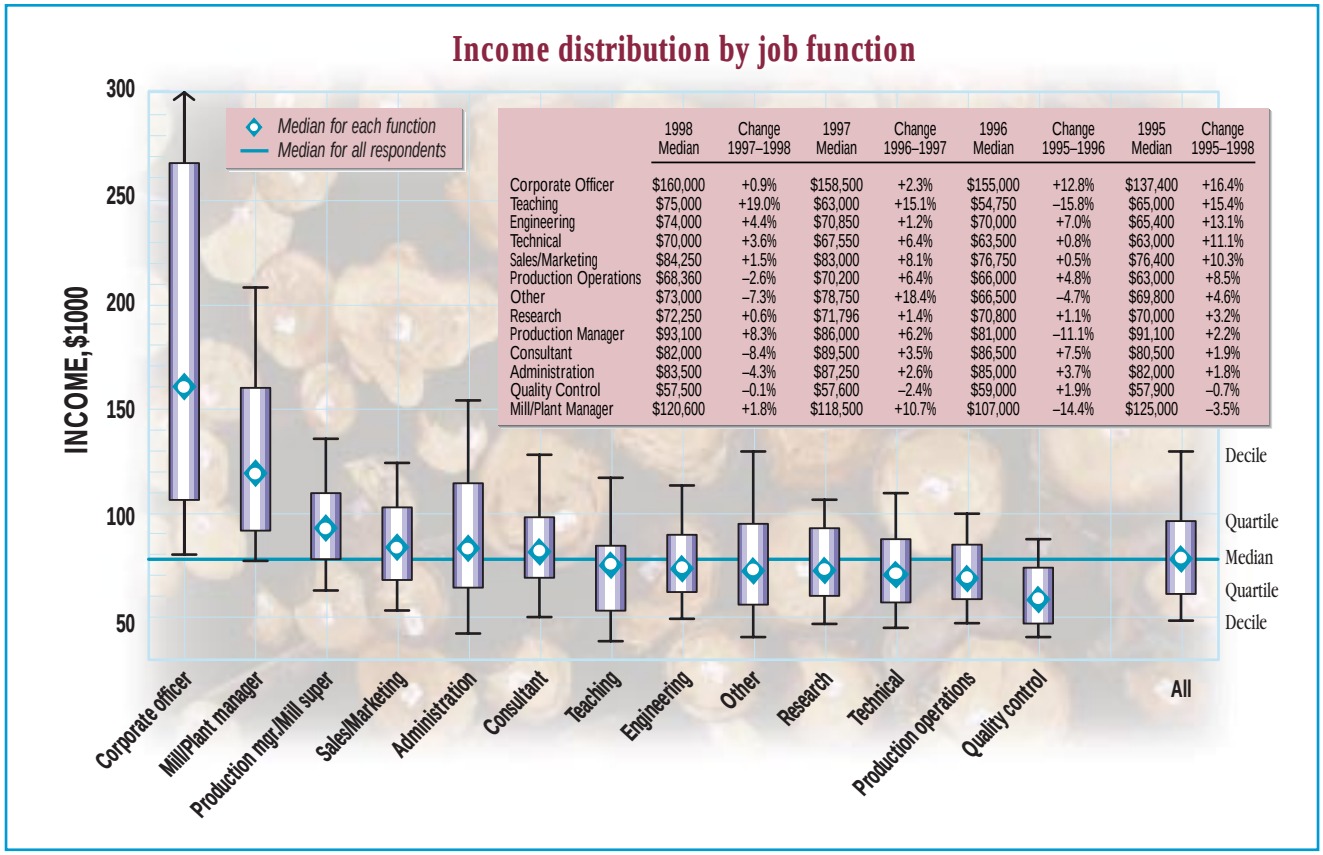
5. Response rate for 13 job functions

year to year, it is hard to spot trends. However, a review of data since 1990 shows that the Corrugated sector is not as robust as it used to be. From 1990 through 1995, Corrugated was the dominant sector with the highest median income in three of those years and never dropping below the third position. In 1997 it fell to the fourth position, tumbling to the sixth position in 1998. Coating and Graphic Arts shows a similar trend. Throughout the 1990s, median income in this sector had been consistently above the overall median for all respondents. However, in 1998, the median for Coating and Graphic arts was $73,000, its lowest level since 1994.

Finally, Product/Process Quality has shown the most consistent performance throughout the 1990s, occupying last or next-to-last place with a median salary well below those of the other sectors.

JOB FUNCTION AND INCOME

The pie chart in Fig. 5 shows the breakdown of respondents for the 13 job-function categories. The results are



	1998 Median	Change 1997–1998	1997 Median	Change 1996–1997	1996 Median	Change 1995–1996	1995 Median	Change 1995–1998
Corporate Officer	$160,000	+0.9%	$158,500	+2.3%	$155,000	+12.8%	$137,400	+16.4%
Teaching	$75,000	+19.0%	$63,000	+15.1%	$54,750	–15.8%	$65,000	+15.4%
Engineering	$74,000	+4.4%	$70,850	+1.2%	$70,000	+7.0%	$65,400	+13.1%
Technical	$70,000	+3.6%	$67,550	+6.4%	$63,500	+0.8%	$63,000	+11.1%
Sales/Marketing	$84,250	+1.5%	$83,000	+8.1%	$76,750	+0.5%	$76,400	+10.3%
Production Operations	$68,360	–2.6%	$70,200	+6.4%	$66,000	+4.8%	$63,000	+8.5%
Other	$73,000	–7.3%	$78,750	+18.4%	$66,500	–4.7%	$69,800	+4.6%
Research	$72,250	+0.6%	$71,796	+1.4%	$70,800	+1.1%	$70,000	+3.2%
Production Manager	$93,100	+8.3%	$86,000	+6.2%	$81,000	–11.1%	$91,100	+2.2%
Consultant	$82,000	–8.4%	$89,500	+3.5%	$86,500	+7.5%	$80,500	+1.9%
Administration	$83,500	–4.3%	$87,250	+2.6%	$85,000	+3.7%	$82,000	+1.8%
Quality Control	$57,500	–0.1%	$57,600	–2.4%	$59,000	+1.9%	$57,900	–0.7%
Mill/Plant Manager	$120,600	+1.8%	$118,500	+10.7%	$107,000	–14.4%	$125,000	–3.5%

6. Income distribution by job function

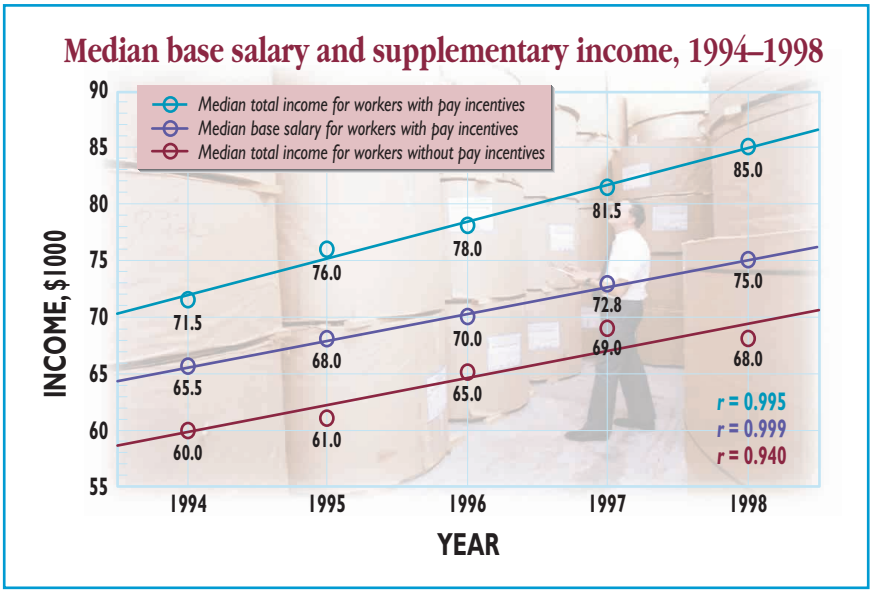
gory, and Consultants dropped from 6.5% in 1996 to 5.4% in 1997 to 4.3% in 1998.

Four categories-Sales/Marketing, Technical, Engineering, and Research-account for 64% of the respondents. Of these four categories, only Sales/Marketing had a median income exceeding the median for all respondents, as seen in Fig. 6, which shows the breakdown of income by job function.

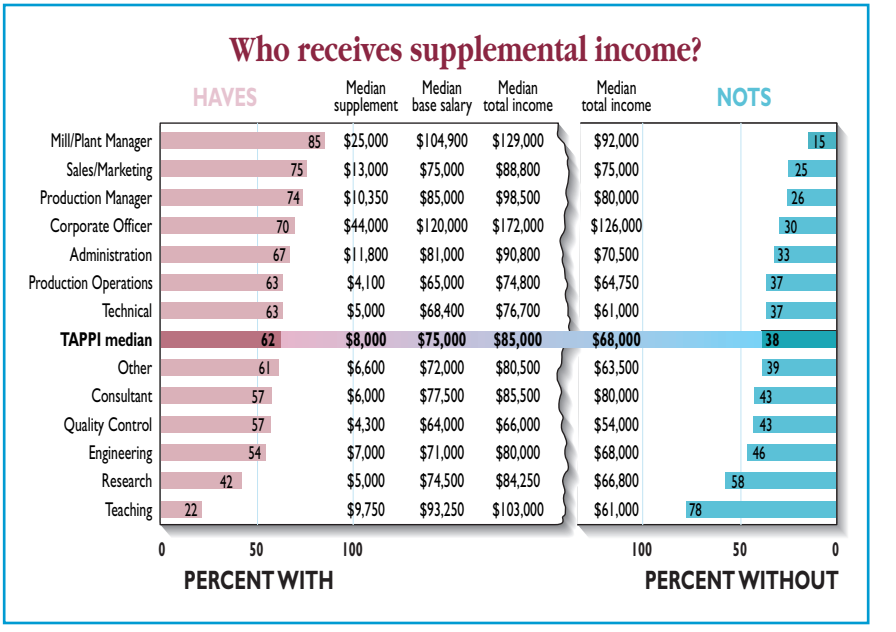
As always, the categories for Corporate Officer and Mill/Plant Manager led the field, with Quality Control resuming its customary position at the other end of the continuum. However, the 1998 data alone do not tell the whole story, especially given the volatility our industry has experienced over the past four years. Earnings for mill/plant managers are a case in point. Workers in this category rely heavily on pay incentives. Their median income peaked in 1995, tanked in 1996, recovered somewhat in 1997, and increased again in 1998. And while the earnings for this group are surpassed only by corporate officers, the median income remains 3.5% less than it was in 1995.

The table embedded in **Fig. 6** lists the median incomes by job function for 1995-1998, along with the percent change in median for each year. The job functions are ranked in descending order of the percent change in 1998 compared with 1995. Median income for corporate officers, teachers, engineers, technicians, and sales reps has increased by 10% or more since 1995. In contrast, mill/plant managers and quality control workers have suffered a drop in median income.

Five of the 13 job functions showed a drop in median income from 1997 levels, with consultants taking the biggest hit.



7. Median base salary and supplementary income, 1994-1998



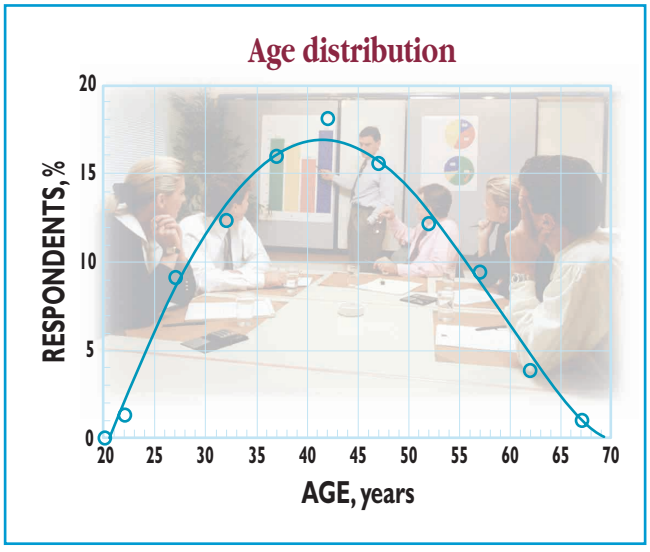
8. Who receives supplemental income?

PAY INCENTIVES

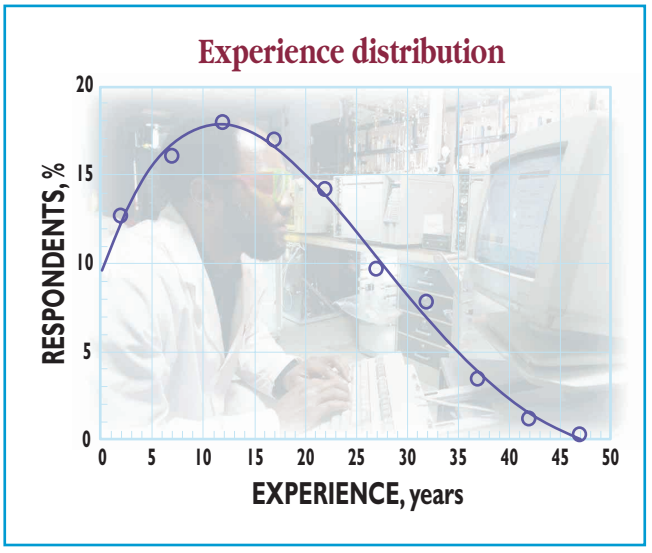
Trends

We now have five years of detailed data on pay incentives (bonuses, commissions, and other extrasalary payments). In 1994, 54% of the respondents reported some type of supplemental income. That figure has increased over the years and ticked upward again in 1998 to 62%.

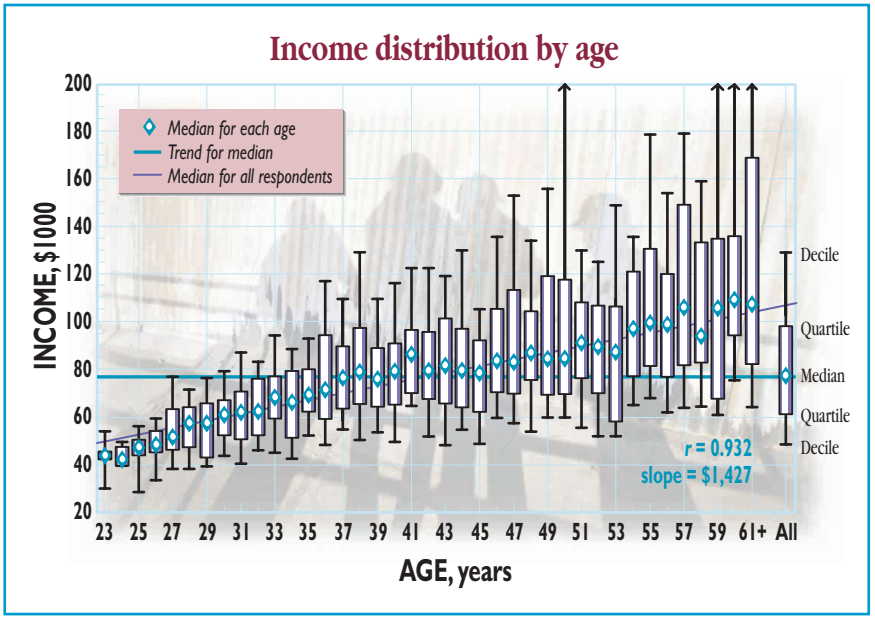
Pay incentives create a two-tier system of remuneration-the haves and the have-nots. Workers who receive a salary plus pay incentives earn substantially more than workers who receive a straight salary, as seen in **Fig. 7**. Indeed, even without the incentives, the base salary for these workers is about $5700 more than the total income of those who receive no extrasalary payments. The trend lines show that this $5700 gap has remained steady since we began tracking pay incentives in 1994. However,



9. Age distribution of survey respondents



11. Experience distribution of survey respondents



10. Income distribution by age

when you include pay incentives in total income for the workers who receive these benefits, it is clear that the gap between the haves and the have-nots gets wider every year. The trend lines show that the gap between total income for the haves and have-nots has grown steadily since 1994, from 20.2% to 22.3% in 1998. Because base salaries for the haves and have-nots have grown at the same rate ($2400 per year), this widening gap shows that pay incentives are becoming a larger component of total income for those who receive them. Indeed, the trend lines show that pay incentives increased from 9.8% of base salary in 1994 to 11.6% in 1996 to 13.1% in 1998.

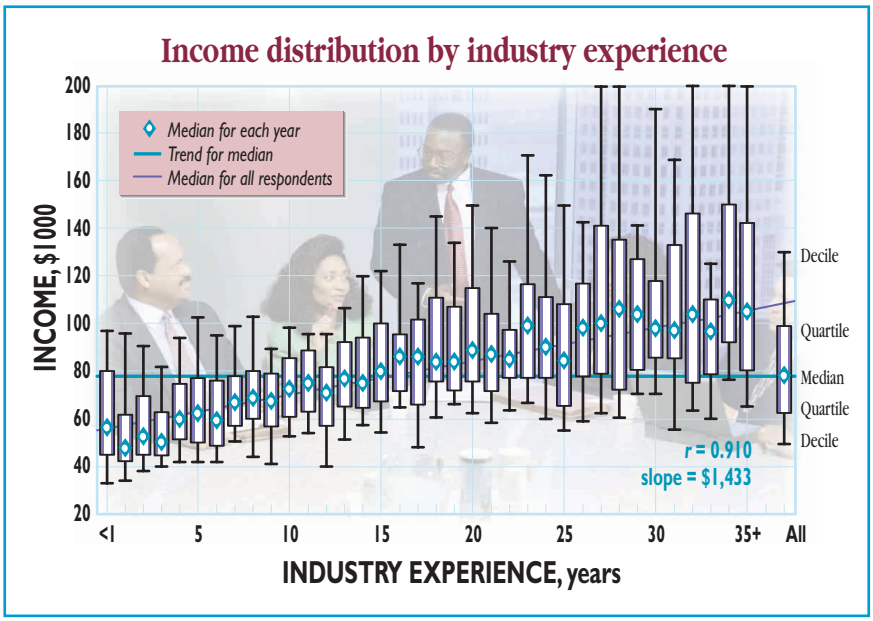
Presumably, those who receive incentives are also at greater risk of taking a cut in pay during unfavorable market conditions. In fact, nearly one in four respondents reported that bonuses in 1998 were less than in 1997. Consider again the case of mill/plant managers. This job category has the highest percentage of workers with pay incentives (85%). When the business cycle was peaking in 1995, they were flying high with a median income of $125,000. When the boom times ended in 1996, median income plummeted to $107,000, and it remains 3.5% below its 1995 high-water mark. If the effects of inflation are factored in, median income for mill/plant managers in 1998 is actually 10% less than it was in 1995. Production managers-three-fourths of whom receive pay incentives-suffered a similar drop in median income from 1995 to 1996. In 1998, the median finally surpassed its 1995 peak, but not by much. In fact, after adjusting for three years of inflation, the median for production managers in 1998 is 4.5% less than it was in 1995.

Pay incentives by job function

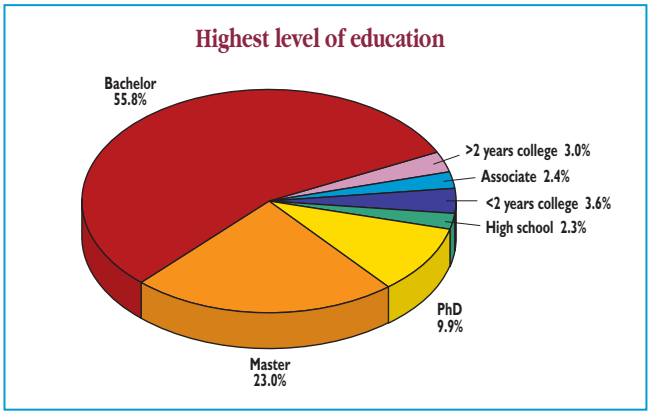
Who receives these pay incentives? **Figure 8** shows that mill/plant managers are the most likely to receive supplemental income. Sales reps, production managers, and corporate officers are also high on the list of likely recipients.

The importance of pay incentives varies, depending on the job function. For the 62% of TAPPI respondents who received pay incentives, the ratio of median supplemental income to median base salary was 11%. This ratio was highest for corporate officers (37%), mill/plant managers (24%), sales/marketing (17%), administration (15%), and production managers (12%). The lowest ratios were for those in engineering (10%), teaching (10%), other (9%), consultants (8%), technical (7%), quality control (7%), research (7%), and production operations (6%).

Workers who received pay incentives had higher incomes than those who received only a salary. Indeed, for workers with supplemental income, the median base salary alone exceeded the median total income of the have-nots across all job functions with three exceptions: corporate officer, sales/marketing, and consultant.



12. Income distribution by industry experience



13. Highest level of education

AGE AND INCOME

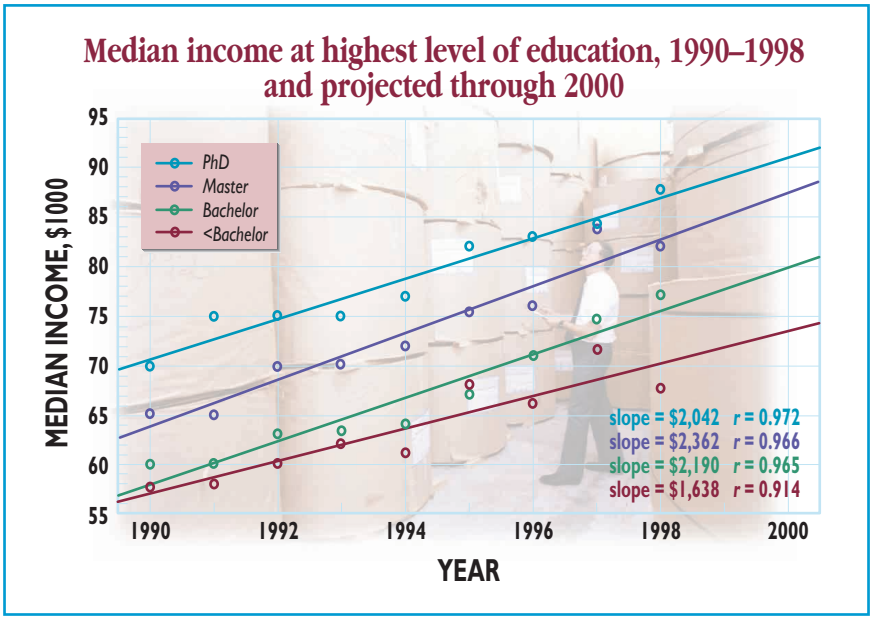
Figure 9 shows the age distribution of TAPPI members who returned the survey. The median age was 42 years, the same as it was in 1996 and 1997.

Figure 10 is a quantile plot showing the breakdown of income by age. The slope of the trend line for median income indicates that it increases by $1427 with each additional year of age. The trend line intersects the median income for all respondents at the median age of 42.

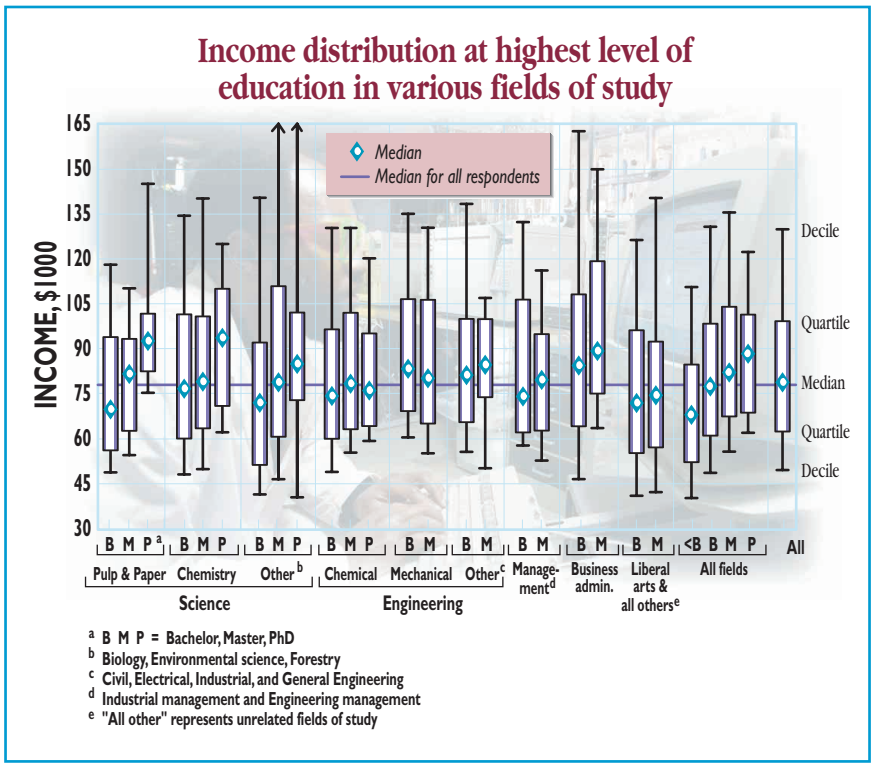
EXPERIENCE AND INCOME

Figure 11 shows the distribution of industry experience within the TAPPI membership. The median level of experience for all respondents was 15 years, the same as it has been since 1994, when we first asked respondents to state their experience in specific years rather than a range of years. For men (88% of the respondents), the median was 16 years, compared with a median of 9 years for women (12% of the respondents).

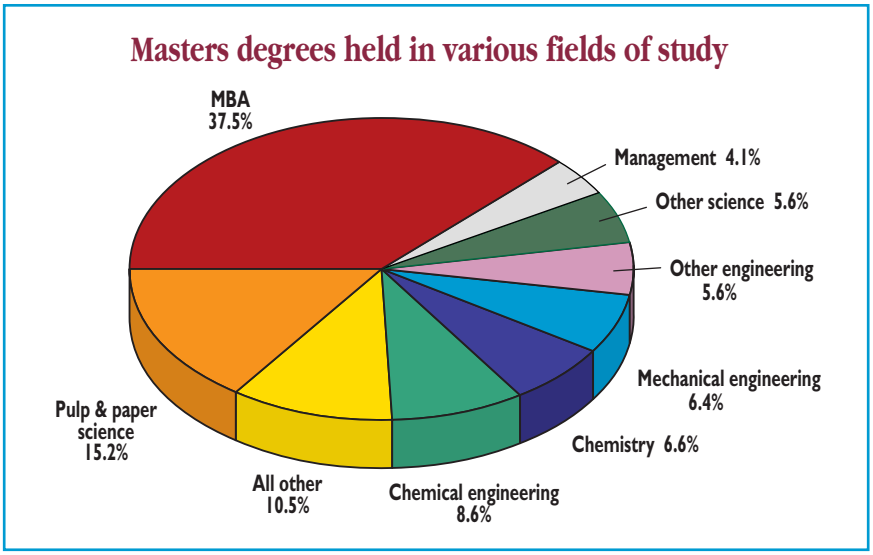
Figure 12 is a quantile plot showing the breakdown of income by industry experience. The slope of the



14. Median income at highest level of education, 1990–1998 and projected through 2000



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



16. Masters degrees held in various fields of study

trend line for median income indicates that the median increases by $1433 with each year of industry experience. This is nearly identical to the slope of the trend line for age in Fig. 10, suggesting that both variables have the same effect on median income. The trend line intersects the median income for all respondents at 15.5 years, slightly above the median level of experience.

EDUCATION AND INCOME

Figure 13 shows the overall educational makeup of the TAPPI membership. There has been little change in this figure since 1990. The percentages in each category may fluctuate a point or two each year, but this pie chart is essentially the same as the one we ran in 1990.

Figure 14 shows median income at the highest level of education since 1990. Median income at the master and bachelor levels has increased by 30% since 1990, compared with 23% for PhD and bachelor.

Figure 15 is a quantile plot showing the distribution of income at the highest level of education within various fields of study. Note that the data reported in Fig. 15 are based on the highest level of education achieved by each respondent. Any lesser degrees earned by someone with a masters degree or a PhD were temporarily deleted from the database while we developed this figure. In cases where someone held two degrees at the highest level of education-for example an MBA and a masters in chemical engineering-both degrees were considered. Note also that the figure excludes some PhD and master categories because there were not enough respondents to produce statistically meaningful results.

The results for "all fields" on the right-hand side of Fig. 15 show an orderly upward progression in income with increasing level of education. This stair-step pattern of income progression is also evident in the field of pulp and paper science and in the "other" science category.

Pulp and Paper Science had the lowest median at the bachelor level, but the median at the master and PhD levels was higher than in most of the other fields of study. Median income for liberal arts was in line with the specialized fields of study at the bachelor level but was lower than all other fields at the master level. The MBA is clearly the most lucrative of the various master categories, with a median income of

$89,300 compared with a median of $79,350 for masters degrees in all other fields of study. Not surprisingly, it is also the most widely held masters degree, as seen in **Fig. 16**.

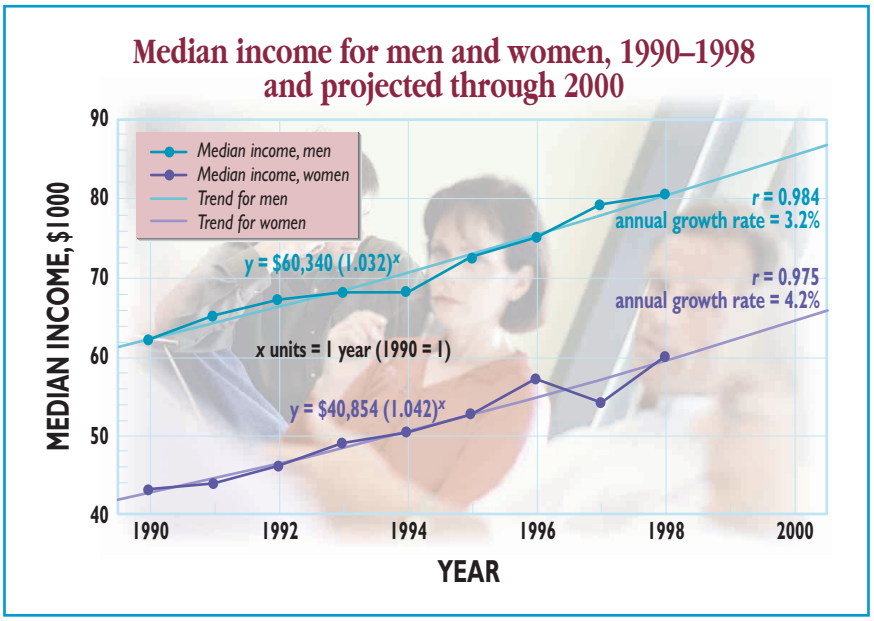
GENDER AND INCOME

Figure 17 shows median income for male and female respondents since 1990. The trend lines show that the gap in median income for men and women has widened from $19,700 in 1990 to $21,000 in 1998. In the 10-year time scale of Fig. 17, it looks like women are losing ground. However, if we consider the effects of inflation, it is clear that the income gap between men and women is actually narrowing.

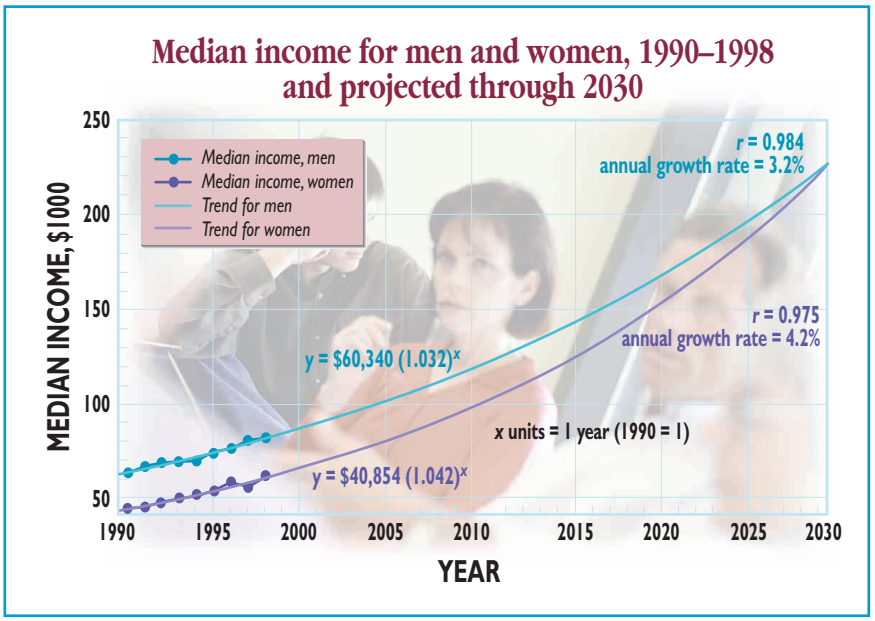
In 1990, median income for women was about two-thirds of the median for men. Today, the median for women is close to three-fourths of the median for men. These numbers strongly suggest that income parity for men and women is only a matter of time. The question is, When?

The best-fit models for the two trend lines in Fig. 17 are exponential rather than linear, and they show that median income for women is growing at an annual rate of 4.2%, significantly higher than the rate of 3.2% for men. To visualize the time scale for these growth rates, we expanded Fig. 17 until the curves for men and women intersected. The result was **Fig. 18**, which suggests that income parity could be more than a generation away.

Actually, we suspect that it may not take quite so long to achieve income parity, since the current model is based on a male-dominant demographic that is becoming less dominant each year. The proportion of female respondents is continually increasing, and the disparity in median income between men and women is lowest for younger workers. Nevertheless, women still earn less than male peers with the same level of experience-including those just entering the industry-as seen in **Fig. 19**.



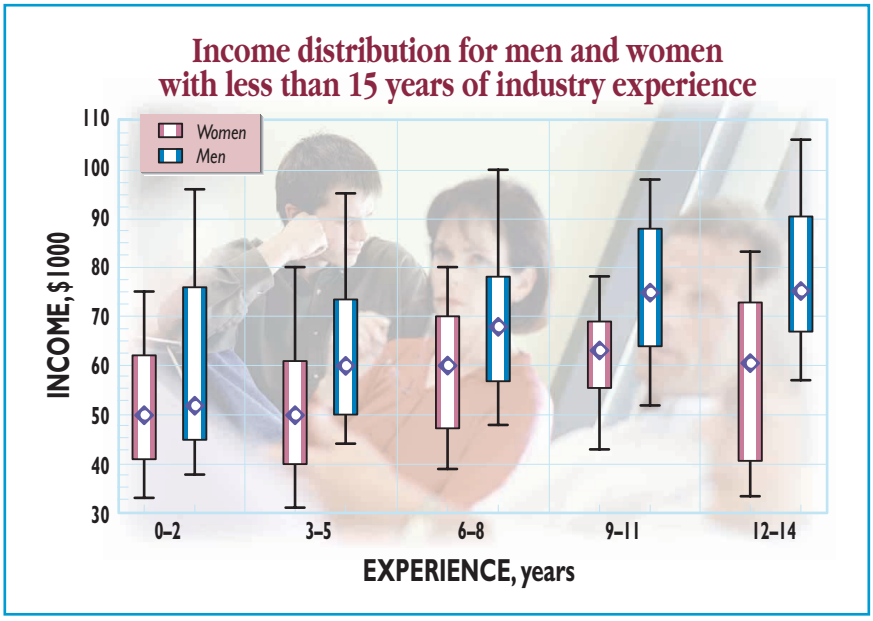
17. Median income for men and women, 1990-1998 and projected through 2000



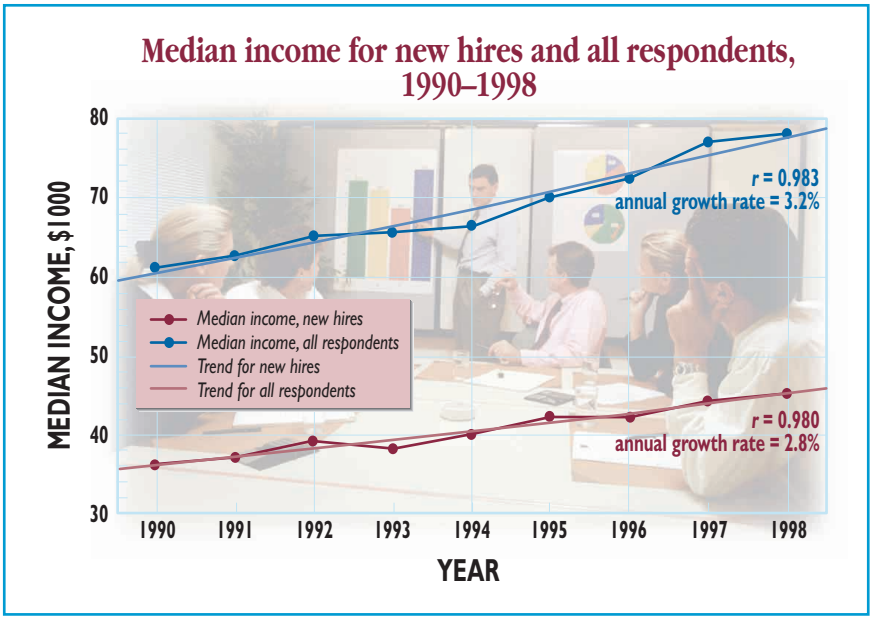
18. Median income for men and women, 1990-1998 and projected through 2030

NEW HIRES

We estimate the going rate for new hires by shrinking the database to include 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. This left us with a sample of only nine respondents-five women and four men-with a median income of $45,000, a 2.7% increase over 1997.



19. Income distribution for men and women with less than 15 years of industry experience



20. Median income for new hires and all respondents, 1990-1998

Figure 20 shows that median income for new hires has increased at an annual rate of 2.8% compared with a 3.2% rate of growth for all respondents. As a result, median income for new hires has dropped from 60% of the median for all respondents in 1990 to 58% in 1998.

INFLATION AND INCOME

Inflation dropped for the third consecutive year to 1.6%, down slightly from 1.7% in 1997. These are historic lows. The last time we saw two consecutive years with inflation below 2% was 1964-65. While the 1.4% increase in TAPPI median income was not historically low, it was unusually low-the fifth-smallest increase since 1981. Nevertheless, it was low enough to be eclipsed by the second-lowest inflation rate in 35 years.

Figure 21 depicts the year-to-year change in the consumer price index (CPI) and median income since 1981. Median income has shown a net gain in 10 years and a net loss in 8 years. The bleakest stretch was the five-year span from 1990 through 1994, when median income outpaced inflation only once, in 1992. That trend was reversed in 1995, the first of three consecutive years of income growth that ended in 1997, when low inflation and a huge jump in median income combined to produce a net gain of 4.4%, the largest ever measured in a TAPPI salary survey.

Figure 22 shows the growth in median income (as reported in TAPPI salary surveys) since 1980. The figure also provides a useful point of reference by adjusting the median income that was reported in 1980 ($38,000) for inflation. The actual median income tracked the inflation-adjusted median through 1984. Substantial gains in 1985-87 raised the reported median above the inflation-adjusted median, where it has stayed ever since despite a near collision in 1994. Since then, median income has rebounded to its strongest position vis-à-vis the CPI since 1980.

The median income of $38,000 in 1980 translates to $72,162 in 1998 dollars after adjusting for inflation. This year's reported median of $78,000 thus represents a surplus of 8.1%-$5838 in today's dollars-over the inflation-adjusted median income for 1980. Knock 8% off your income and you're living in 1980.

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So what is the source of this 8% surplus? Because the marketplace is the ultimate arbiter of value, the surplus must represent some form of added value. Consider that the baseline year for our income comparisons-1980-antedates the explosion of computer technology that revitalized our mature industry. Since then, automated process control and better equipment have dramatically increased the industry's production efficiency and product quality while reducing unit costs. At the same time, competition in the global market has intensified, diminishing but not erasing these hard-won gains. Given the advances in the industry since 1980, it seems reasonable to interpret the net surplus of 8% in median income as an indirect measure of the industry's progress over the past 18 years. As workers in 1998, it's easy for us to take this surplus for granted. A worker from 1980 with a window to 1998 would surely see it as a bonus. TJ

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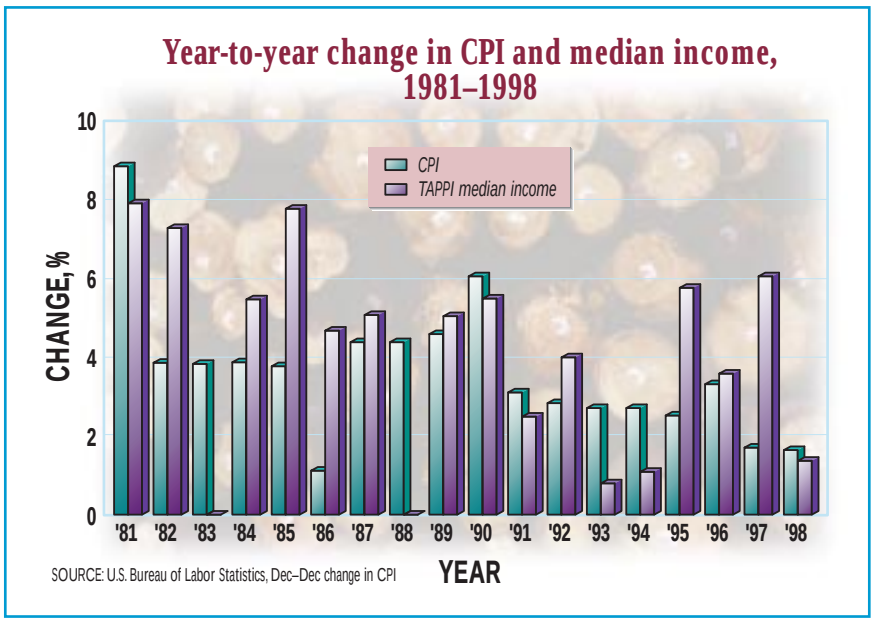
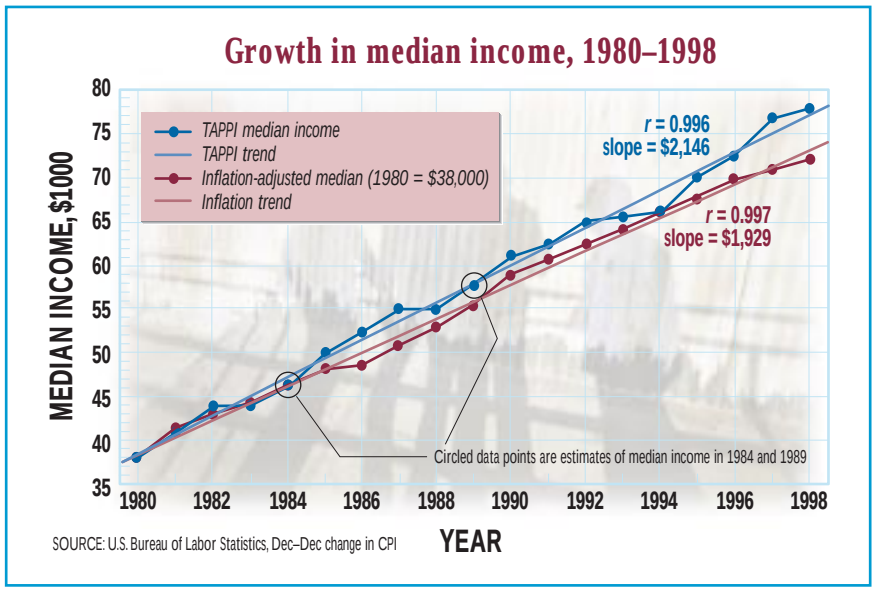


21. Year-to-year change in CPI and median income, 1981-1998



22. Growth in median income, 1980-1998