The Use of Economic Data in Collective Bargaining

A Manual for State, Provincial and Local Affiliates as a Guide to Salary Negotiations and the Development of Economic Presentations

International Association of Fire Fighters®

International Association of Fire Fighters®
1750 New York Avenue, N.W.
Washington, D.C. 20006
202.737.8484
Fax 202.737.8418
www.iaff.org

International Association of Fire Fighters, Canada
Association International Des Pompiers
350 Sparks Street, Suite 403
Ottowa, Ont., Canada K1R 7S8
613.567.8988
Fax 613.567.8986

MANUAL

Introduction

This updated version of The Use of Economic Data in Collective Bargaining manual is designed to be used by all members of the International Association of Fire Fighters. Despite its title, the manual's usefulness is not limited to those locals with collective bargaining statutes and impasse procedures. Even those locals who are precluded from bargaining with their employers will find the principles and techniques described here useful in making a case before any public group, be it city council, state legislatures, citizens' groups, or the media.

This manual is not intended to make you an expert in economic policy. Its purpose is to help locals develop accurate, well-constructed, credible arguments to support their demands and positions. It attempts to accomplish this by familiarizing readers with the necessary economic principles and mathematical techniques, and with the techniques that will almost certainly be used by the other side.

The manual is made up of two major parts. The first part consists of six narrative and descriptive chapters plus relevant appendices. The chapters deal with the following areas: measures of central tendency (the mean, median, and weighted average), the Consumer Price Index, ways of making comparisons between your local and others, costing your current and proposed agreements, fire fighter productivity, and municipal finances. The second part is a workbook, with an answer section, which we hope will reinforce the techniques we have presented.

If you are in collective bargaining, we caution you to assemble the kinds of information described in this manual as soon as possible. Collective bargaining is an ongoing process and it requires that you frequently assess and analyze your position relative to other locals and relative to hoped-for gains. Keeping data current and becoming familiar with the techniques presented here makes this process easier. Certainly, when making proposals and at the bargaining table, you should have this information available, intact, and up to date. Locals which have been very successful at the bargaining table have by and large been those which have gathered their information well in advance and have prepared their case as if they were going to impasse. Indeed, good preparation may very well preclude an impasse situation.

When preparing information for negotiations, we urge you to take an honest and critical look at the situation your local faces and the relevant data. As we emphasize in the manual, do not ignore, or worse yet, try to hide data which may be potentially detrimental to your case. Trying to present your case in the best light does not include ignoring facts. Develop the bad with the good; you can be sure the other side will do so.

Obviously, this does not mean that you should present information to the other side which is potentially harmful to your case. However, it does mean that you must be prepared to defend your case against unfavorable information. Anticipate that management will find and present data that may refute your case. Therefore, your job is to develop effective counter arguments in advance. This can be done effectively for almost any situation.


AUSTIN FIRE DEPARTMENT

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Chapter I:
Measures of Central Tendency— The Mean, Median, and Weighted Average

There are numerous situations in collective bargaining where it is necessary to compare various pieces of similar data, such as the salary of the negotiating IAFF local in comparison to the salaries of other IAFF locals. It is unlikely that the salary structures of any two locals will be exactly alike, so comparing the negotiating local to the others one by one is likely to result in as many comparisons as there are locals. Interpreting all of these comparisons is difficult — particularly if the purpose of those comparisons is to support the demand for a specific salary increase.

To overcome this difficulty, it is often desirable, even necessary, to use a single figure representative of the salaries of all those other locals. Properly done, this helps bring the comparisons into better focus, and, even more important, facilitates the interpretation of the data.

Obviously, any such single figure must have statistical validity. In other words, it must be truly representative of all those other figures for which it has been chosen as a stand-in. It must be adequately descriptive of all those other figures or it has no meaning.

The set of data to be described is called a ***universe***. For negotiating purposes, the universe is made up of other municipalities comparable in some way to that of the negotiating local. (Choosing the most appropriate comparable cities to make up this universe is very important, and a number of different criteria can be used. This is discussed in more detail in Chapter 3.)

Several methods are used to arrive at a figure which will describe an entire set of data. In general, these methods are called ***measures of central tendency*** because they are ways of describing the center or middle ground of a set of data. The two most common measures of central tendency are the arithmetic mean — popularly known as the average — and the median. A third measure, the weighted average, is used when the data values have different relative weights.

The Average or Mean

The arithmetic ***mean,*** or average, is found by adding all values in a set and dividing by the number of items in the set. For example, if there are three engine companies in a given town with a staffing level of 21, 13, and 11 fire fighters, respectively, then the average number of fire fighters per company is computed as follows:

$$(21 + 13 + 11) \div 3 = 15.$$

The table below presents data on fire fighter salaries in 11 selected cities. The calculation of the average salary for the group is quite simple. The salary figures for each city are added together and then divided by the number of figures used.

Table 1–1
Calculation of the Average Fire Fighter Salary for 11 Selected Cities

	City	Fire Fighter Annual Salaries
1.	San Francisco	$45,918
2.	Boston	43,315
3.	Phoenix	40,626
4.	Seattle	39,129
5.	Denver	38,393
6.	San Antonio	37,123
7.	Pittsburgh	36,601
8.	New Orleans	34,881
9.	Cleveland	34,574
10.	Baltimore	34,538
11.	Indianapolis	33,533
	Total	**$418,631**

Average = $418,631 ÷ 11 = $38,057

The average can be greatly influenced by the presence of high or low figures in the list, and the more extreme the figure, the more influence it has. If, for example, the highest

salary in the table were deleted — San Francisco's $45,918 — the average salary for the remaining 10 cities would fall $786 to $37,271 ($372,713 ÷ 10). Likewise, if the lowest salary were excluded — $33,533 — the average salary for the remaining 10 cities would increase $453 to $38,510 ($385,098 ÷ 10).

The simple average assumes that all data items occur the same number of times; i.e., that all of the data items have the same relative weight. This is often not the case, and so there are many situations where the simple average does not adequately describe the situation. For example, if a department has ten people making $30,000 per year, five people making $35,000 per year, and one person making $40,000 per year, it is misleading to describe the departmental average as $30,000 + $35,000 + $40,000 divided by 3. For these situations the ***weighted average*** is used. This is discussed in more detail later in this chapter.

The Median

The ***median*** is the middle value in a set of data. If the data is arranged in order from the highest value to the lowest, or lowest to highest, the median is the middle value. (A set of data ordered in this way is called an ***array***.) As will be explained in this section, one of the major advantages of the ***median*** as a measure of central tendency of any set of data is that it is not unduly influenced by extreme high or low data values.

To establish the median for any set of data, it is first necessary to order the data from high to low, or from low to high. This was already done in Table 1–1. Since there are 11 data items listed in that table, locating the median is easy. It is simply the mid-point; in this case, the sixth item, San Antonio's salary of $37,123. Note that the actual dollar amounts represented by San Francisco or Indianapolis exert no special influence. San Francisco's salary could be $20,000 greater than it is in Table 1–1, and the median of that list would still be $37,123, while the average salary would have been greatly affected by such an extreme value.

Regardless of how many entries are listed in the array — three, thirty, or three thousand — the median is that point in the array at which there are as many entries above as there are below. In the array with the entries 21, 13, 9, the median is 13. If the array had these five entries — 21, 13, 11, 10, 9 — the median would be 11. If the array had these seven entries — 21, 13, 13, 12, 6, 6, 6 — the median would be 12. Note that the fact that some entries are identical has no effect on the location of the median.

If the set of data contains an even number of items, order the data and take the average of the two middle items. For example, Table 1–2 below lists ten cities. The median value for this set of data is found by taking the two middle items, numbers 5 and 6, adding those values, and dividing that number by 2. Note that it is still true that there are an equal number of items above the median and below the median.

Table 1–2
Average Fire Fighter Salary for 10 Selected Cities

	City	Salary
1.	San Francisco	$45,918
2.	Boston	43,315
3.	Phoenix	40,626
4.	Seattle	39,129
5.	Denver	38,393
6.	San Antonio	37,123
7.	New Orleans	34,881
8.	Cleveland	34,574
9.	Baltimore	34,538
10.	Indianapolis	33,533

The median of an array with an even number of entries equals the average of the two middle entries. For example, the median in table 1–2 above is the average of number 5, Denver, ($38,393) and number 6, San Antonio, ($37,123).

Median = ($38,393 + $37,123) ÷ 2 = $37,758

To again emphasize the point that the median is not overly influenced by extremes in the data, note that even if San Francisco's salary were $60,000, the median for the data in Table 1-2 would still be $37,758.

The Weighted Average

In many data analysis problems, the simple average, or mean, does not adequately describe the situation. For example, it would be misleading to calculate the average salary of the unit described below in Table 1–3 as $32,943, the total of column 3 divided by the number of entries in the column, because there are different numbers of fire fighters in different job classifications. A statistic called the ***weighted average*** overcomes this problem by taking into account the relative significance of each piece of data in the array.

In Table 1–3, Column 1 shows the classifications of fire fighters while Column 2 shows how many fire fighters are in each classification. Note that there is an uneven distribution of fire fighters among the classifications. Column 3 shows the salary for each classification.

The *simple average* is found by totalling the salaries in Column 3 and dividing by seven entries, to obtain $32,943. However, as mentioned earlier, this figure does not accurately describe the average salary in the unit because the number of fire fighters in each classification is not the same.

The *weighted average* takes into account this uneven distribution. To find the weighted average of this set of data, first multiply the number of fire fighters in each classification (column 2) by the salary of each classification (column 3). This result is in column 4. Next, total the weighted salaries in column 4, and divide the column 4 total by the total number of fire fighters, in this case, 100.

Table 1–3
Computation of Weighted Average Salary of a Unit of Fire Fighters

(1) Classification of Fire Fighters	*(2) Distribution of Fire Fighters*	*(3) Annual Salary*	*(4) Weighted Salary (2) X (3)*
Probationary			
Step 1	15	$29,000	$435,000
Step 2	10	$30,000	$300,000
Private			
Longevity-0	25	$32,000	$800,000
Longevity-I	20	$32,500	$650,000
Longevity-2	10	$33,500	$335,000
Lieutenant	15	$35,200	$528,000
Captain	5	$38,400	$192,000
Totals	**100**	**$230,600**	**$3,240,000**

Simple Average: $230,600 ÷ 7 = $32,943

Weighted Average Salary: $3,240,000 ÷ 100 = $32,400

Difference between Simple Average and Weighted Average: $32,943 - $32,400 = $543

Note that the unit's weighted average salary is $543 less than the inaccurate simple average figure. Use of the weighted average can avoid the misleading results that might be produced by focusing on a single salary figure not truly descriptive of the unit's salaries.


METRO
FIRE RESCUE
METRO
FIRE RESCUE

Chapter II:
The Consumer Price Index *

The Consumer Price Index (CPI) is compiled and published by the Bureau of Labor Statistics (BLS). The CPI is a statistical barometer which measures the average change in prices of a fixed market basket of goods and services over time, starting from a designated reference point. It is important to be aware of the fact that the CPI measures the percentage change in price levels over time, not the actual prices of goods and services in dollars and cents.

The CPI is based on prices of food, clothing, shelter, fuel, transportation, medical services, and the other goods and services people buy for day to day living. The items the BLS prices fall into the seven broad categories of Food and Beverages, Housing, Apparel and Upkeep, Transportation, Medical Care, Entertainment, and Other Goods and Services. There are price change indexes published for each of these separate categories and for additional subgroups within the categories as well.

In order to measure price changes, BLS representatives actually go into stores and other business establishments in different cities and record the prices of specific items. They will price a specific article of clothing, a specific electric appliance, a specific can of vegetables, etc. On each successive visit, they will price the same items, or, if an item is no longer being sold, the closest thing to it. Mail questionnaires are used to obtain public utility rates, some fuel prices, and certain other items.

The BLS collects prices in 85 urban areas throughout the country from about 57,000 housing units and 19,000 retail establishments such as stores, hospitals, supermarkets, and gas stations. The index includes all taxes directly associated with the purchase and use of the items. Certain items, such as food, fuel, and a few others, are priced every month at all 85 locations. Most other commodities and services are priced every month in the five largest geographic areas and every other month in other areas.

The BLS publishes CPI figures for two non-geographic population groups. The first is the CPI for All Urban Consumers, called the CPI-U, which covers approximately 80 percent of the total population. This group includes wage earners, clerical groups, professional, managerial and technical workers, the self-employed, short-term workers, and, in addition, retirees, the unemployed, and others not in the work force. The second is the CPI for Urban Wage Earners and Clerical Workers, called the CPI-W, which covers about 32 percent of the population. The consumers in the latter group earn more than one-half of their income from clerical or wage occupations. Since most IAFF members fall into this category and work in and reside in urbanized areas, the CPI-W is usually considered the more relevant of the two indexes for use by the union in collective bargaining.

The BLS also publishes separate indexes by size of city, by region of the country, for cross-classifications of regions and population-size classes, and for 27 local areas. Area indexes measure the average change in prices for each area compared to the base period; they cannot be used to measure the differences in price levels between cities. (This is discussed later in this chapter.)

The conversion of consumer prices (or any other series of data, such as salaries, hours of work, output, etc.) to an index is done in order to reduce the numbers to a form that greatly facilitates interpretation and analysis. Combining the various prices of all items priced by the BLS into an index figure provides a simple and statistically convenient method of measuring the change in those prices over periods of time.

Measuring Price Change

In order to analyze price change data effectively, it is necessary to establish a reference point; in other words, to choose a date in the past and compare prices now to prices then for the same items. This date is referred to as a ***base year***. Until January of 1988, the BLS used 1967 as the base year. Beginning with price data from January 1988, most Consumer Price Indexes shifted to new reference base years — December 1982 for the CPI-U, and December 1984 for the CPI-W. You will usually see the new base year referred to as the 1982–84 base because the indexes for 1982, 1983 and 1984 are often averaged in order to combine them into one number used for both the CPI-W and the CPI-U. The BLS publishes many figures using both the 1967 and 1982–84 bases for completeness of comparison.

*Note: See Appendix A: Information Sources — for information on how to obtain CPI reports. See Appendix F for examples of BLS New Releases and Reports.

The base year prices are said to be equal to an index of 100. For example, if the CPI-U market basket of goods referred to earlier had cost $110 in 1982, for purposes of the index that $110 would be equal to 100 index points because 1982 is the base year for the CPI-U. If that same market basket cost $132 in 1996, overall prices would have increased by 20% (calculated by determining the change in price from 1982 to 1996, in this case an increase of $22, and dividing the increase by the base year price. $22 ÷ $110 = .20 = 20%) In this fictitious example, the index in 1996 would have been 120, an increase of 20 index points.

Table 2–1 below helps to illustrate this point. It shows the average annual CPI for the years 1978 through 1996. Note that the index for 1996 is 154.1. This means that the cost of the market basket of goods and services in 1996 was 54.1% greater than the cost of the same items in 1982–84.

Table 2–1
Consumer Price Index for the United States, 1978–1996 (CPI-W)
(1982–84 = 100)

		Change from Previous Year	
Year	Index	Points	Percent
1978	65.6	—	—
1979	73.1	7.5	11.4%
1980	82.9	9.8	13.4
1981	91.4	8.5	10.3
1982–84	100.0	8.6	9.4
1985	106.9	6.9	6.9
1986	108.6	1.7	1.6
1987	112.5	3.9	3.6
1988	117.0	4.5	4.0
1989	122.6	5.6	4.8
1990	129.0	6.4	5.2
1991	134.3	5.3	4.1
1992	138.2	3.9	2.9
1993	142.1	3.9	2.8
1994	145.6	3.5	2.5
1995	149.8	4.2	2.9
1996	154.1	4.3	2.9

Note: The specific index figures for 1982, 1983, and 1984 are 96.9, 99.8, and 103.3 respectively. The BLS averages these three to get the 1982–84 index of 100.0.

Source: U. S. Department of Labor, Bureau of Labor Statistics. See Exhibit 1 at the end of this chapter.

Thus, measured against the *base period*, in this case, 1982–84, each index point is equal to one percentage point. But, as we shall see below, this is the only time when an index point is the equivalent of a percentage point.

Computing Percent Change

Index points and percentage points are not the same things but they are easily confused. The only time a one point change in the CPI equals a one percent change is when measured against the base year. In any other comparison, a one point change in the CPI *does not* equal a one percent change. When the measurement is made from the base period to some subsequent time, the index series readily shows not only the increase in index points, but also in terms of percent. Measurements covering other periods, however, require some computations in order to derive the increase in terms of percent change.

The last two columns in table 2–1 are intended to demonstrate the difference between a change in index points and the resulting percent change. In 1995 the CPI advanced to 149.8, an increase over 1982–84 of 49.8 points and 49.8 percent. The increase measured against 1982–84 produces a situation in which the change in points and the change in percent are identical. But this is not the case in any other year. The index in 1996 moved up to 154.1, an increase of 4.3 points above 1995. That increase, however, was equal to a 2.9% increase over 1995.

The formula used to compute either a percent increase or a percent decrease, in the CPI or in any set of data, is rather simple. It is:

Percent change = (Amount of change) ÷
(figure from which change has occurred) X 100

For example, the 1993 index is 142.1 and 1994 is 145.6. The amount of change from 1993 to 1994 is

145.6 - 142.1 = 3.5.

The figure from which the change has occurred is the 1993 index of 142.1, so we divide the difference by that number. 3.5 ÷ 142.1 = 2.46 which converts to 2.46% or 2.5% rounded up.

Local Area Indexes

The national index is compiled and published by BLS on a monthly basis. The index for any year is calculated by averaging the indexes for each of the 12 months. As mentioned earlier, in addition to the national CPI, the BLS also issues separate indexes for 27 large Standard Metropolitan Statistical Areas, which include each city and those surrounding suburban areas considered to be within commuting distance of that city. A few of these local indexes are published monthly, but most are compiled by the BLS on a quarterly basis.

It is important to note that the local CPI data is only applicable to the specific area or region for which it is calculated. Larger, city-based unions can, if they choose to do so, use data for their specific metropolitan area, but locals not included in those areas will have to refer to the regional or national indexes. In addition, the BLS notes in their monthly CPI news bulletins that the local indexes are by-products of the national index, and are more volatile and may not be as precise in the short term as the national index. Therefore, the Bureau strongly urges consideration of the use of the national average CPI for use in escalator clauses.

The table below lists the publication schedule for the available metropolitan and regional areas. The included metropolitan areas and the publication schedule are adjusted occasionally due to population changes.

Consumer Price Index Sample Areas and Regions, by Size Classes and Publication Schedules

Sample Areas	Publication Schedule
UNITED STATES	Monthly
U.S. LARGE METROPOLITAN AREAS	Monthly
U.S. MIDSIZED METROPOLITAN AREAS	Monthly
U.S. SMALL METROPOLITAN AREAS	Monthly
U.S. NON-METROPOLITAN AREAS	Monthly
NORTHEAST REGION	Monthly
Northeast Metropolitan Areas of 1.2 million and above	Monthly
Northeast Metropolitan Areas of 500,000 to 1.2 Million	Monthly
Northeast Metropolitan Areas of 75,000 to 500,000	Monthly
New York-Northern New Jersey-Long Island, NY-NJ-CT	Monthly
Philadelphia-Wilmington-Trenton, PA-DE-NJ-MD	Monthly
Boston-Lawrence-Salem, MA-NH	Bimonthly
Pittsburgh-Beaver Valley, PA	Bimonthly
Buffalo-Niagara Falls, NY	Semiannually
NORTH CENTRAL REGION	Monthly
North Central Metropolitan Areas of 1.2 million and above	Monthly
North Central Metropolitan Areas of 360,000 to 1.2 million	Monthly
North Central Metropolitan Areas of 75,000 to 360,000	Monthly
North Central Non Metropolitan Areas of 2,500 to 75,000	Monthly
Chicago-Gary-Lake County, IL-IN-WI	Monthly
Detroit-Ann Arbor, MI	Bimonthly
St. Louis-East St. Louis, MO-IL	Bimonthly
Cleveland-Akron-Lorain, OH	Bimonthly
Minneapolis-St. Paul, MN-WI	Semiannually
Milwaukee, WI	Semiannually
Cincinnati-Hamilton, OH-KY-IN	Semiannually
Kansas City, MO-KS	Semiannually
SOUTHERN REGION	Monthly
Southern Metropolitan Areas of 1.2 million and above	Monthly
Southern Metropolitan Areas of 450,000 to 1.2 million	Monthly
Southern Metropolitan Areas of 75,000 to 450,000	Monthly
Southern Non Metropolitan Areas of 2,500 to 75,000	Monthly
Washington, DC-MD-VA	Bimonthly
Dallas-Fort Worth, TX	Bimonthly
Baltimore, MD	Bimonthly
Miami-Ft. Lauderdale, FL	Monthly
Houston-Galveston-Brazoria, TX	Bimonthly
Atlanta, GA	Semiannually
WESTERN REGION	Monthly
Western Metropolitan Areas of 1.2 million and above	Monthly
Western Metropolitan Areas of 330,000 to 1.2 million	Monthly
Western Metropolitan Areas of 75,000 to 330,000	Monthly
Los Angeles-Anaheim-Riverside, CA	Monthly
San Francisco-Oakland-San Jose, CA	Monthly
Seattle-Tacoma, WA	Semiannually
San Diego, CA	Semiannually
Portland-Vancouver, OR-WA	Semiannually
Denver-Boulder, CO	Semiannually
Honolulu, HI	Semiannually
Anchorage, AK	Semiannually

Inter-Area Comparisons

Misconceptions surrounding the CPI often lead to erroneous inter-area comparisons. The CPI, whether for the nation or for the local areas, shows only the *change* in prices, in terms of index points, for the geographic area, (that is, for the United States as a whole or one of the local areas) to which the index applies.

Specifically, the national index measures the *change* in prices for all of the nation's urban areas combined. By the same token, the index for Chicago measures the *change* in consumer prices for Chicago, the Detroit index the *change* for Detroit, the Boston index the *change* for Boston.

Thus, the local area CPI's can be used to determine whether prices in one area are rising faster or slower than in other areas or in the nation as a whole. However, *it is impossible to tell from those separate indexes whether prices are higher, lower, or the same in one area compared to another.* This is because the CPI measures only the *change* in prices. It says nothing whatsoever about price levels.

The CPI is not designed to make inter-area comparisons of living costs. For example, the fact that the October 1996 index was 165.0 for Philadelphia and 157.0 for San Francisco does not necessarily mean that prices or living costs were higher in Philadelphia. In fact, according to the best gauge available for such comparisons — the Urban Family Budgets — just the opposite was true. However, what these two numbers do indicate is that since the base year of 1982–84, the prices of the market basket items have been rising faster in Philadelphia than in San Francisco. That is the limit of the extent to which the local indexes can be used for inter-area comparisons.

The reason this is true is the underlying concept involved in base numbers. Both the Philadelphia index and the San Francisco index have 1982–84 as the base period, for which each index is 100. But that does *not* mean that the price levels were the same in both cities in the base year. The index of 100 does not tell us what the prices were. Whatever they were — regardless of how much the market basket of goods and services cost in 1982–84 in either city — the cost for the year was arbitrarily labeled 100. And the index for Philadelphia measures only the *change* in prices *in Philadelphia*, while the index for San Francisco measures only the *change* in prices *in San Francisco*.

A brief example may be helpful. Suppose, to use some simplified numbers, that in 1982–84 the cost of the CPI market basket was $125 in San Francisco and $100 in Philadelphia. For purposes of the CPI, both would be arbitrarily labeled "100", as has been done in the following example.

Cost of Market Basket in 1982–84	*1982–84 Index*	*1996 Index*	*Price Increase 1984–1996*	*Cost of Market Basket in 1996*
San Francisco				
$125	100	120.0	20% ($25)	$150 ($125 + $25)
Philadelphia				
$100	100	125.0	25% ($25)	$125 ($100 + $25)

Assume now, as has been done in the above table, that the index for 1996 was 120.0 for San Francisco and 125.0 for Philadelphia — an increase since 1982–84 of 20.0 percent for San Francisco and 25.0 percent for Philadelphia. The higher 1996 index for Philadelphia indicates that the cost of the market basket rose faster, percentage-wise, in Philadelphia. But it will *not* support the conclusion that the cost of living, or the cost of the market basket, is higher in Philadelphia than in San Francisco. In our example, the 1996 cost of the market basket in San Francisco would still be higher than in Philadelphia—$150 versus $125 — although prices since 1982–84 have risen faster in Philadelphia.

In terms of dollars and cents, each city started from a different point in 1982–84. Where the CPI is concerned, however, there is nothing in the index figures for either of the cities to tell us which had higher prices in 1982–84, or which had higher prices in 1996.

Measuring "Real" Income

The major use of the Consumer Price Index in the collective bargaining arena is that it provides a gauge of the impact of prices on the purchasing power of worker's incomes.

For example, Table 2–1 shows that from 1982-84 through 1996 the CPI increased by 54.1 percent. The implication of such a price increase on the buying power of salaries or wages is clear. Unless workers, over the same time period, received at least a 54.1 percent increase in their incomes, matching the price rises during this period, those incomes in 1996 would no longer purchase the same amount of goods and services as they did in 1984. Thus, workers' "real" incomes would have declined. On the other hand, if increases in pay exceeded the increases in prices, the workers' "real" incomes, and thus their standard of living, would have risen. If wage or salary increases merely equalled price increases, then the workers simply stood still

in terms of "real" income and buying power. This section of the chapter explains how to accurately calculate changes in "real" income. It is not as obvious as it might seem at first.

As mentioned earlier, the ability to make these determinations, and to make them accurately and with precision, is necessary for effective negotiation, and often may be crucial to the union's case. It is easy to slip into an overly simplistic and totally inaccurate method of computation. In order to make the necessary computations in the correct way, the dollar figures — the salaries or wages for different years — must be converted to so-called "constant" dollars. That is, they must be converted to dollars of the same value — the same buying power. In other words, they must be adjusted for the impact of inflation. Then, and only then, can the underlying "real" gain be determined.

A brief example demonstrates the problem that results when this computation is not performed correctly.

According to Table 2–1, the CPI increased from 65.6 in 1978 to 154.1 in 1996, a rise of 134.9 percent (calculated as follows: 154.1 - 65.6 = 88.5; 88.5 ÷ 65.6 = 1.349, or 134.9%). For purposes of our example, let us assume that over the same period, the average fire fighter's salary in some city advanced from $17,000 per year in 1978 to $42,000 in 1996, an increase of 147.0 percent ($42,000 - $17,000 = $25,000; $25,000 ÷ $17,000 = 1.47 = 147.0%).

At first glance, it might seem that the increase in real salary during these years was 12.1 percent — the difference between the increase in salary — 147.0 percent — and the increase in the CPI — 134.9 percent. However, this is not the case because the actual calculation is not that simple. The *real* gain is considerably less because the 1996 salary is made up of "inflated" dollars — dollars worth less than they were in 1978. Consequently, the measurement that produced the salary gain of 147.0 percent involved a comparison (1996 vs. 1978) in which each set of dollars had altogether different values.

To ignore this difference in the value of the two sets of dollars is like ignoring the differences between liters and quarts, meters and yards, or degrees centigrade and degrees Fahrenheit. If we were making a temperature comparison and we had the 1978 figure in degrees centigrade and the 1996 figure in degrees Fahrenheit, our first task would be to convert the data to a common standard. That is, we would either convert the 1978 figure to Fahrenheit or the 1996 figure to centigrade. Only then could we measure the change in temperature between 1978 and 1996.

So it must be with those 1978 and 1996 dollars. In order to determine what they represent, they must first be converted to a common standard — that is, into "constant" dollars, in contrast with "current" dollars. In short, both the 1978 and 1996 figures must be adjusted to eliminate the impact of price change. Only in this way can we discover how much more buying power the 1996 salary actually represents.

The conversion of the salary figures from "current" dollars into "constant" dollars involves the use of the CPI. But instead of converting the salary figures into either 1978 or 1996 values, the use of the CPI — with its base year of 1982–84 representing 100 — enables us to translate both figures into constant (1982–84) dollar values. That is, the 1978 salary is converted into a figure that, in effect, represents how many dollars would have been required in 1982–84 to match the 1978 purchasing power of that 1978 salary. Correspondingly, the 1996 salary gets converted into a figure that represents the number of dollars that would have been needed in 1982–84 to match the 1996 buying power of that 1996 salary.

The computation is quite simple. Move the decimal point on the index figure two places to the left, and then divide that number into the 1978 salary. In our example, we change the index of 65.6 to .656 and then divide $17,000 by .656. This yields $25,915 in constant (1982–84) dollars. In other words, it would have required $25,915 in 1982–84 to buy the same amount of goods and services that the actual 1978 salary of $17,000 was able to buy in 1978.

The constant (1982–84) dollar figure for 1996 is calculated by dividing $42,000 — the 1996 salary — by 1.541 — the 1996 CPI of 154.1, decimal point moved two places to the left. That gives us $27,255 — the salary needed in 1982–84 to match the 1996 purchasing power of the 1996 salary of $42,000.

Through this process, the current dollar salary figures for 1978 and 1996 have been converted into constant 1982–84 dollar values of $25,915 and $27,255. And by measuring the amount of this increase, we can obtain the gain in real income:

$$\$27{,}255 - \$25{,}915 = \$1340$$

$$\$1340 \div \$25{,}915 = .0517 \text{ or } 5.2\%$$

As shown by this computation, the real change in salary — the change in purchasing power — between 1978 and 1996 turns out to be a gain of only 5.2%. This is less than the 12.1% given by erroneously calculating the difference between index and salary increases.

Table 2–2 presents a hypothetical fire fighter's salary over an eight year period, before and after adjusting for inflation. Thus, column (1) shows the current dollar salary for each year, and column (3) contains the salaries in constant (1982–84) dollars. The CPI figures, which appear in column (2), are the actual indexes for each of the years, as published by the Bureau of Labor Statistics and previously presented in Table 2–1.

Table 2–2
Conversion of Fire Fighter Annual Salaries into Constant Dollar Salaries

Year	(1) Annual Salaries	(2) U.S. Consumer Price Index 1982–84 = 100	(3) Salaries in Constant (1982–84) Dollars (1) ÷ (2) *
1989	$30,000	122.6	$24,470
1990	31,000	129.0	24,031
1991	32,000	134.3	23,827
1992	33,000	138.2	23,878
1993	34,000	142.1	23,927
1994	35,000	145.6	24,038
1995	36,000	149.8	24,032
1996	37,000	154.1	24,010
	Percent Increases — Total for Given Time Period		
1989–1996	23.3%	25.7%	-1.9%
1989–1992	10.0%	12.7%	-2.4%
1992–1996	12.1%	11.5%	.6%
	Percent Increases — Average Per Year Within Given Time Period		
1989–1996	3.3%	3.7%	-.27%
1989–1992	3.3%	4.2%	-.8%
1992–1996	3.0%	2.9%	.15%

* Note that before dividing the figure in column (1) by the figure in column (2), the decimal point in column (2) must be moved two places to the left.

The center section of Table 2–2, "Percent Increase — Total," is a recapitulation covering selected time spans. The table shows a 23.3% increase in the hypothetical fire fighter's salary between 1989 and 1996, a 25.7% increase in the CPI during the same seven years, and a -1.9% change in the salary during the same time period when it is converted to constant 1982–84 dollars. Similar information is presented in the table for the 1989–1992 period and the 1992–1996 period.

The bottom section of Table 2–2, "Percent Increases — Average Per Year," shows the increases per year; that is, the total increase for the time period divided by the number of years. For example, the 23.3 percent increase in the annual salary between 1989 and 1996 works out to an average of 3.3 percent increase per year (23.3 ÷ 7 years). During 1989–1992, the real change per year for the hypothetical salary averaged -.8 percent (-2.4% ÷ 3 years), while the average during 1992–1996 was .15 percent (.6 ÷ 4 years).

One more point should be made regarding index numbers. Had we chosen to do so, any year other than the average of the years 1982–84 could have been used as the base period. The result would have been to change the index numbers, but not any of the underlying relationships, such as the percentage change in price levels or the measurements of "real" income.

Table 2–3 demonstrates this. In this table, indexes based on the same price level changes computed on different base years are placed in the respective columns. The years 1978, 1982–84, and 1988 are used as the base periods. Note that the degree of change measured over each of the time periods is exactly the same, regardless of which index series is used.

Table 2–3
Indexes of Constant Dollar Salaries Using Three Different Base Periods

Year	1978=100	1982–84=100	1988=100
1978	100.0	65.6	55.1
1979	111.3	73.1	61.3
1980	126.3	82.9	69.6
1981	139.4	91.4	78.1
1982	147.9	96.9	81.6
1983	152.6	99.8	84.2
1984	157.5	103.3	88.3
1985	164.9	106.9	91.0
1986	168.0	108.6	92.7
1987	174.0	112.5	96.0
1988	178.4	117.0	100.0
1989	186.9	122.6	104.8
1990	196.6	129.0	110.7
1991	204.7	134.3	115.2
1992	210.6	138.2	118.1
1993	216.5	142.1	121.8
1994	221.9	145.6	124.8
1995	228.3	149.8	128.4
1996	234.8	154.1	131.7
	Percent Increases — Total for Given Period		
1989–1996	25.7%	25.7%	25.7%
1989–1992	12.7%	12.7%	12.7%
1992–1996	11.5%	11.5%	11.5%
	Percent Increases — Average Per Year for Given Period		
1989–1996	3.7%	3.7%	3.7%
1989–1992	4.2%	4.2%	4.2%
1992–1996	2.9%	2.9%	2.9%

As the above table shows, a change in the base year changes the appearance of the index, but that is all. Regardless of which base period is used, the index figures reflect the same percentage relationships in price levels and those relationships cannot be altered merely by choosing a different base period for comparison. This is akin to stating the same amount in distance in yards and in meters, or measuring a room's temperature in degrees centigrade and degrees Fahrenheit. The numbers used to report the results are different, but this does not change the amount of distance or the amount of temperature.

In the case of the three indexes in Table 2–3, because the base periods are different, an index point has a slightly different "value" in each of the indexes. For example, from 1989 to 1996, all of the indexes reflect an increase of 25.7 percent. But for the index with the 1978 base, the increase involved 47.9 *index points* (from 186.9 to 234.8); for the 1982–84 based index, the increase was 31.5 *index points* (from 122.6 to 154.1); and for the index with 1988 as the base, there was an increase of 26.9 *index points* (from 104.8 to 131.7).

So it is, too, with the CPI. As noted earlier, the BLS publishes the CPI on a base of 1967 = 100 as well as a base of 1982–84 = 100. Both indexes are registering exactly the same price movements, but they are using measuring rods that are calibrated differently. This does not have any effect on the underlying change in prices. In terms of percent change, both indexes yield identical results.

Thus, according to the CPI with 1982–84 as its base, the average index for 1993 was 142.1; for 1995 it was 149.8. This amounts to an increase of 7.7 points and 5.4 percent (7.7 ÷ 142.1).

Although very useful, the CPI has limitations. It should be understood that the CPI may not be applicable to all questions about price movements for all population groups. For example, the indexes are designed to represent the average movement of prices for the U.S. urban population and so are not precisely appropriate for use by nonurban residents. Also, the CPI does not provide data separately for the rate of inflation experienced by any particular demographic subgroup of the population, such as the elderly.

In addition, the indexes cannot be used to determine relative living costs. An individual geographic area index measures how much prices have changed in that particular area over a specific time period. As emphasized earlier, it does not show whether prices or living costs are higher or lower in that area relative to another.

A further limitation is that the CPI is not a complete measure of price change. Because the index is estimated from a sample of consumer purchases, the results may deviate slightly from those which would be obtained if all consumer transactions were covered. (This is called estimating error or sampling error, and it is a mathematical limitation of the index.)

Note: See Appendix F for a sample Bureau of Labor Statistics News Release.

Chapter III:
The Development of Comparisons *

Comparisons are basic to the collective bargaining process. They are used by the union (or the employer) to support its position in negotiations or before a third-party neutral. The comparisons may be with other groups of workers, or against some kind of yardstick or standard.

There are various kinds of comparisons that might be developed in support of a demand for a pay increase. These may include, for example, comparisons of the current salary levels of the negotiating local with the current salary levels of

a. fire fighters in other cities, or

b. other occupations within the city, or

c. a combination of the two.

In combining (a) and (b), the resulting comparison might attempt to show the relative position of the negotiating fire fighters — that is, how their salaries rank in relation to salaries of other occupations (public sector or private sector) within the city — compared to how fire fighters in other cities rank in relation to those same occupations within their respective cities.

The same kinds of data might be compared over a stretch of time. Although the salary for the negotiating local may be higher than any of the other salaries, the negotiating unit may nevertheless have been receiving smaller increases, and thus may have lost ground in relation to other groups. This approach is often necessary for a unit which is at the "head of the parade," but it can also be used regardless of what the local's salary may be.

The salaries can, of course, be converted to an hourly basis. For fire fighter locals with an extended workweek, this will lend a different perspective to their yearly salaries. Because of those extended hours of work, the hourly rate of pay received by fire fighters is typically much lower than their annual salaries make it appear. And as those hours of work are reduced, comparisons in which the salary data (for fire fighters and other groups) are presented on an hourly basis may become increasingly important, if only to demonstrate just how modest the hourly rate is, even with the reduction in hours.

* Note that the salary information contained within this manual is hypothetical and is for demonstration purposes of this manual only.

As was indicated in the previous chapter, other types of comparisons may be employed in developing a case for a pay increase, and these may involve the use of CPI or Urban Family Budget figures. For example:

- Has the salary for the negotiating local kept ahead of the rise in the cost of living and, if so, by how much? In short, what has been the impact of the increase in prices on the purchasing power of the salary?
- How have collective bargaining settlements been running for other fire fighters and for other groups in the public and private sectors?[1]
- How do the salaries of the negotiating local stack up against the BLS Urban Family Budgets? And, of course, how do those salaries compare to the salaries of others?

There is, as all of this suggests, a variety of ways to build a case for an increase. The comparisons that are finally settled on by the negotiating local must depend, obviously, on which combination yields the results that it needs. And what it needs are results that support its demands and are credible.

Selection of the Universe

Proper selection of what statisticians refer to as the "universe" is crucial to the credibility of any presentation of data. The "universe" is simply all of the data used in a comparison. For example, in a comparison of fire fighter salaries in different cities, the universe would be all the cities whose salaries are included in that comparison. The choice of municipalities in the universe must be based on sound

1. Information on settlements of IAFF local unions may, of course, be obtained from the technical assistance and labor issues department of the IAFF. There are many sources of more general information on collective bargaining settlements, including newspapers and direct contacts with other unions in the area.

   The U.S. Bureau of Labor Statistics publishes a monthly periodical, "Compensation and Working Conditions" that carries reports of the major settlements throughout the nation. Similar data are compiled and published by the Bureau of National Affairs, which is a private organization. BNA reports can be found in many public or college libraries.

reasoning to make a credible case on the basis of such comparisons. When selecting an appropriate universe, the union must look for some kind of similarity or comparability between its own situation and that of the locals to which it is comparing itself.

The most common method of choosing a universe of municipalities for the purpose of contract negotiation is to include all those of comparable size. Size is definitely important; it is unlikely that a credible salary comparison can be made between the fire fighters in a town of 50,000 people and those in a city of two million. However, it is far from the only appropriate consideration. In fact, as we will discuss, cities very close in population often have few other characteristics in common which are relevant to fire fighters, and it is more logical to compare them with another group of cities.

Sometimes the universe is historical; the union and the city may traditionally agree to use a certain group of cities as a basis of comparison. But in the absence of an historical base, a number of other factors can be used to further refine the universe. Some of these can be expressed numerically, such as percent of pre-World War II construction, number of high-rise buildings, resident density, and number of square miles included in the city limits. There are also non-numerical factors. For example, the fact that a city does or does not have a subway system or a harbor may make the case that it is more comparable to some cities than others of similar size. The important point is that there are no hard and fast rules in choosing a universe. The only requirement is that the final universe of cities be chosen using relevant, credible criteria.

An example follows which illustrates how this can be done effectively. We start with all cities of a certain size and refine the universe, using criteria other than resident population, to build a very convincing case for making a comparison to cities other than those closest in population.

Table 3–1 on the next page lists the 30 largest (in population) cities in the United States. We can see that ranked strictly by resident population, Boston is listed twentieth. If we wanted to make some comparisons between Boston and other cities using only resident population, we might include all thirty cities, or we might refine our universe to include those cities closest to Boston in population — Jacksonville, New Orleans, etc.

But look at the other data presented in Table 3–1, and more particularly at Table 3–2. Table 3–2 uses the data from Table 3–1 and assigns a numerical rank to each city according to five other factors relevant to fire fighters — total incidents per 100,000 people, population densities, etc. Now note where Boston ranks using these factors. As you can see, we have a very different picture, but a very credible one. Viewed in this way, Boston seems to be much more comparable to cities such as New York, Chicago, or Philadelphia than to Jacksonville or New Orleans, even though the latter two are much closer to Boston in size. This kind of information can be of obvious value in negotiations.

Although there are no absolute rules in choosing the universe, in developing its case the union cannot — or should not — selectively omit cities. Once the appropriate criteria have been decided on, all cities with those characteristics must be included in the universe. For example, if it is decided to base the universe solely on population size, all cities of the size decided on must be included. Moreover, the union cannot, at least not without sound reason, use one set of cities to justify one part of the demands, and a different set of cities to justify another part.

The mere fact that the negotiating city may already be paying better salaries and/or fringe benefits than some of the other cities in the universe is not necessarily a problem. At some point this is to be expected, since someone must be at the head of every list. Indeed, if the union concocts a universe in which the data show that the negotiating city lags behind all of the other cities, the universe itself is apt to be viewed with suspicion.

Too often, the inability to interpret some seemingly adverse data may prompt a union simply to omit those particular data from a presentation. Unfortunately, the importance of such an omission tends to get magnified out of all proportion when it becomes noted by management and/or a third-party neutral. When that happens, the explanations never seem satisfactory. Such situations should be avoided if at all possible, particularly when the data in question can be adequately handled.

Table 3–1
A Statistical Comparison Between Boston and 29 Other Largest Cities

Jurisdiction	1992 Population	Square Miles	Resident Pop. Density Per Sq. Mi.	% Housing Built Pre-1939	Housing Density Per Sq. Mi.	Total Incidents	Total Incidents Per 100,000	Total Incidents Per Sq. Mi.
New York City	7,311,966	309	23,663	40.9	9,683	340,303	4,654	1,101
Los Angeles City	3,489,779	469	7,441	17.4	2,772	312,491	8,954	666
Chicago	2,768,483	227	12,196	44.6	4,991	162,880	5,883	718
Houston	1,690,180	540	3,130	6.0	1,345	124,084	7,341	230
Philadelphia	1,552,572	135	11,501	51.6	4,999	204,781	13,190	1,517
Detroit	1,012,110	139	7,281	35.8	2,950	184,794	18,258	1,329
San Diego [1]	1,148,851	324	3,546	8.6	1,332	70,644	6,149	218
Dallas	1,022,497	342	2,990	6.8	1,361	87,932	8,600	257
San Antonio	966,437	333	2,902	8.6	1,097	40,785	4,220	122
Phoenix	1,012,230	420	2,410	2.9	1,005	119,162	11,772	284
Baltimore	726,096	80	9,076	41.2	3,796	229,415	31,596	2,868
San Francisco	728,921	47	15,509	55.1	6,989	58,659	8,047	1,248
Indianapolis	746,538	362	2,062	20.2	884	56,394	7,554	156
San Jose	801,331	171	4,686	5.5	1,517	52,155	6,509	305
Memphis	610,275	256	2,384	11.0	971	101,995	16,713	398
Washington DC	585,221	61	9,594	37.7	4,565	147,008	25,120	2,410
Jacksonville	661,177	759	871	6.9	352	63,686	9,632	84
Milwaukee	617,043	96	6,428	38.4	2,648	61,474	9,963	640
Columbus	642,897	191	3,366	17.5	1,456	94,774	14,742	496
New Orleans	489,595	181	2,705	33.2	1,246	11,606	2,371	64
Cleveland	502,539	77	6,526	52.6	2,913	48,000	9,551	623
Denver	483,852	153	3,162	25.7	1,566	58,040	11,995	379
El Paso	543,813	245	2,220	7.4	688	50,873	9,355	208
Seattle	519,598	84	6,186	36.2	2,965	63,597	12,240	757
Kansas City	431,553	312	1,383	27.7	647	38,559	8,935	124
St. Louis	383,733	62	6,189	55.7	3,144	17,986	4,687	290
Atlanta	394,848	132	2,991	18.9	1,385	43,330	10,974	328
Cincinnati	364,278	77	4,731	43.1	2,196	70,009	19,219	909
Pittsburgh	366,852	56	6,551	55.3	3,039	29,842	8,135	533
Boston	551,675	48	11,493	57.6	5,226	54,835	9,940	1,142
Average	1,123,285	229	5,989	28.0	2,569	101,561	10,909	664

Source: U.S. Bureau of Census; Chicago Survey

[1] Fire Department figures from the 1994 Phoenix Survey, all other cities data from the 1995 Phoenix Survey.

Table 3–2
Comparative Ranking of Characteristics Impacting Fire Department Operations in Boston and 29 Other Largest Cities

City	Resident Population Density Per Square Mile	% Housing Built Pre-1939	Housing Density Per Square Mile	Total Incidents Per 100,000	Total Incidents Per Square Mile
New York City	1	10	1	28	7
Los Angeles City	8	21	13	17	11
Chicago	3	7	5	26	10
Houston	20	28	21	23	23
Philadelphia	4	6	4	7	3
Detroit	9	14	11	4	4
San Diego[1]	17	23	22	25	24
Dallas	22	27	20	19	22
San Antonio	23	23	24	29	28
Phoenix	25	30	25	10	21
Baltimore	7	9	7	1	1
San Francisco	2	4	2	21	5
Indianapolis	28	18	27	22	26
San Jose	16	29	17	24	19
Memphis	26	22	26	5	16
Washington	6	12	6	2	2
Jacksonville	30	26	30	14	29
Milwaukee	12	11	14	12	12
Columbus	18	20	18	6	15
New Orleans	24	15	23	30	30
Cleveland	11	5	12	15	13
Denver	19	17	16	9	17
El Paso	27	25	28	16	25
Seattle	14	13	10	8	9
Kansas City	29	16	29	18	27
St. Louis	13	2	8	27	20
Atlanta	21	19	19	11	18
Cincinnati	15	8	15	3	8
Pittsburgh	10	3	9	20	14
Boston	5	1	3	13	6

Source: U.S. Bureau of Census; Chicago Survey

[1] Fire Department figures from the 1994 Phoenix Survey, all other cities data from the 1995 Phoenix Survey.

Consequently, the union should be prepared to handle a universe in which the data for some of the cities may appear to be adverse to the union's cause. Under these circumstances, ability to interpret the data becomes important. Because this is so, a discussion of techniques for interpreting data appears later in this section.

On the other hand, if the inclusion of such adverse data is apt to destroy the union's argument and prove fatal to its case — as well might happen — then the thing for the union to do is to seek out an altogether different universe, or perhaps an altogether different approach. Meanwhile, it should also be getting ready to respond to the data it chose not to use—since that may be exactly the material it ought to expect management to present.

In short, the union cannot exclude cities from its comparisons simply because it happens not to like the data. Should it do so, the employer's representative is likely to catch it and call attention to the omissions before a third-

party neutral. As a result, such a maneuver by the union may serve to cast doubt over the credibility of the union's entire case.

Selection of the Base Year

If the union must be sensitive to the need for some logic to govern a universe, it must be no less aware that some degree of logic must dictate the choice and use of a base year[2] in making measurements over a span of time.

As discussed in Chapter 2, where real salaries are computed over different periods of time, the starting point of the measurement does make a difference. However, there is no single appropriate starting point. The union can choose whatever year it wishes and introduce measurements that span any period of time. But the union should realize that its choice must be credible — most certainly to any third-party neutral whom the union is seeking to persuade and, if possible, to the employer as well.

The selection of a base year that appears totally arbitrary, and one that cannot be connected to economic trends or bargaining relationships, will not only call into question the particular set of data most directly involved, but will probably lead the third-party neutral to have doubts about the remainder of the presentation also. And, just as the union should not expect to be able to get by when it tries to make its case by improperly juggling its universe of cities, it should also not expect to be able to get by if it uses different base years, without some valid reason, within the same presentation.

Thus, if the union introduces data designed to show that its pay increases have lagged behind the increases received by fire fighters in other cities over the last five years, it should stay with that same five-year period in any other time-span comparisons that it may present. For example, if it introduces comparisons involving increases received by plumbers, sanitation workers, and teachers, then these comparisons should also span the same five-year period. If it introduces data on the steady growth in the number of alarms being handled by the local, it should stay with this five-year period, and if it uses cost of living data over a stretch of time, it should likewise stay with the same time span.

It should not, in short, introduce one item whose measurement is carried back five years, another four years, another six years, etc. Use the same base year for all of the measurements unless it is impossible to do so, or there is good reason not to do so. If different base years are chosen without clear justification, the inclination will be to believe that the union chose a different base year for each measurement because that was the only way it could get the results it was seeking.

2. As used here, base year simply refers to the starting point of any comparison covering a span of time. It should not be confused with the use of such terminology in connection with the base period for an index series (such as, 1982–84 = 100).

The Use of Salary Comparisons

Making wage and salary comparisons between different groups in the same occupation, or between different occupations, is standard in preparing a collective bargaining case. The negotiating local, in seeking to secure the same rate of pay as some other group or groups, is, in effect, laying claim to a share of the "pie" matching the share received by some other workers.[3]

Sometimes the occupational comparisons involve a time dimension. That is, they are concerned not so much with pay *levels*, but rather with the amount of pay *increases*. In these comparisons, the pay increases of the negotiating group are compared over some span of time to the pay increases received by those other workers.

Such comparisons will not always be advantageous for the bargaining local, however. It is very possible that the pay gains of those other groups may be moving up slowly, below national trend rates. If that is the case, reliance on such comparisons will only enable the negotiating group to enjoy the same shortfall experienced by the workers in comparable occupations.

The extent to which the comparability of the occupations becomes an issue of importance in any salary comparisons varies with the way in which the comparisons are employed. Thus, if the union seeks to move up to or come closer to the pay level of another group, and had not previously enjoyed such a standing, the chances are that the comparability of the jobs would be a major item to contend with.

Conversely, a proposal to break an historic relationship, such as parity in pay between the fire and police services, will likely encounter a similar hurdle. The party making such a proposal would, no doubt, be called upon to demonstrate that (a) parity was a mistake to begin with, or that (b) while parity may have been valid at some time in the past, there is now sufficient reason to warrant overturning a pay relationship that has long been in existence.

On the other hand, if the occupational salary comparisons are employed merely to show the amount of pay increases that have occurred, and that the negotiating union is merely seeking not to lose ground relative to these other occupations, the question of occupational similarity becomes less important. It does not become unimportant — simply less important.

3. This assumes, of course, that there is no difference in the amount of fringe benefits.

Pay increases vary over time for groups within the same occupation, as well as from occupation to occupation, and from industry to industry. This occurs for a variety of reasons. The negotiating union will not easily get by with selecting simply those groups or occupations which have received the larger increases, and making comparisons to them only. It would, in all likelihood be expected to justify its selection, or establish that its own group likewise merits such favored treatment.

Consequently, the choice of occupations to be used in the comparisons should be made with some care and reason, and with an eye toward credibility. For it must be remembered, the comparisons have a particular purpose, and that is to show (a) that the pay of the negotiating group should be increased, and (b) the amount by which it should be increased.

Conclusions should be drawn from the comparisons, and they should be rather specific conclusions that indicate just how the comparisons support the union's demands. The comparisons should not be employed simply to present a mixture of data that demonstrate lags in the pay of the negotiating union, leaving to the third-party neutral the job of selecting the lag(s) he considers most significant. It is the union's task to bring into some focus the data it presents — to interpret that data. The union must explain what the union believes the data mean. Otherwise, it is leaving too much to chance.

Uniqueness of Fire Fighting — Job Analysis

The Supplement to the Dictionary of Occupational Titles (DOT) compiled by the U.S. Department of Labor provides a listing of occupations according to their physical demands, working conditions and training time. For each of these three categories the Department of Labor has developed a coding system which indicates the nature of the characteristics associated with each occupation. For example, in the category describing the physical demands normally associated with a particular occupation, six numerical codes are used to describe six distinguishing factors as follows:

1. Lifting, carrying, pushing and/or pulling (strength)
2. Climbing or balancing
3. Stooping, kneeling, crouching, and/or crawling
4. Reaching, handling, fingering, and/or feeling
5 Talking and/or hearing
6. Seeing

The first factor – lifting, etc. – is further refined to indicate the degree of strength normally required for performance of a particular job. The codes used to indicate differences in degree of strength are as follows:

S - sedentary work

L - light work; lifting 20 lbs maximum with frequent lifting and carrying of objects weighing up to 10 lbs.

M - medium work; lifting 50 lbs maximum with frequent lifting and/or carrying of objects weighing up to 25 lbs.

H - heavy work; lifting 100 lbs maximum with frequent lifting and/or carrying of objects weighing up to 50 lbs.

V - very heavy work; lifting objects in excess of 100 pounds with frequent lifting and/or carrying of objects weighing 50 lbs or more.

When one or more of the numerical codes appears for a particular occupation it means that normal performance of that job requires physical exertion of the type indicated. When the numerical code "1" is appropriate, there will also be a letter designation indicating the range of strength required. Thus, according to the DOT listing, performance of the job of fire fighter requires all six listed physical demands; and as the degree of strength required is concerned, the classification of fire fighter was given the maximum rating; a "V," or very heavy work.

In the same manner, the factors describing working conditions are also coded, using a scale from 1 to 7 as follows:

1. Inside, outside or both (I, O, or B)
2. Extremes of cold plus temperature changes
3. Extremes of heat plus temperature changes
4. Wet and humid
5. Noise and vibration
6. Hazards
7. Fumes, odors, toxic conditions, dust and poor ventilation.

In the area of working conditions the DOT indicates that the fire fighter faces:

1. Extremes of heat (i.e., "temperatures sufficiently high to cause marked bodily discomfort unless the worker is provided with exceptional protection.");
2. Temperature changes (i.e., "variation in temperature which are sufficiently marked and abrupt to cause noticeable bodily reactions.");
3. Wet and humid (i.e., "Contact with water or other liquids" plus, "atmospheric condition with moisture

content sufficiently high to cause marked bodily discomfort.");

4. Noise and vibration (i.e., "sufficient noise, either constant or intermittent, to cause marked distractions or possible injury to the sense of hearing, and/or sufficient vibrations – production of an oscillating movement or strain on the body or its extremities from repeated motion or shock – to cause bodily harm is endured day after day.");
5. Hazards (i.e., "situations in which the individual is exposed to the definite risk of bodily injury.");
6. Fumes (i.e., "smokey or vaporous exhalations, usually odorous, thrown off as a result of combustion or chemical reaction.");
7. Odors (i.e., "noxious smells, either toxic or nontoxic.");
8. Toxic Conditions (i.e., "exposure to toxic dust, fumes, gases, vapors, mists, or liquids which cause general or localized disabling conditions as a result of inhalation or action on the skin.");
9. Dust (i.e., "air filled with small particles of any kind, such as textile dust, flour, wood, leather, feathers, etc. and inorganic dust, including silicon and asbestos, which make the workplace unpleasant or are the source of occupational diseases.");
10. Poor ventilation (i.e., "insufficient movement of air causing a feeling of suffocation; or exposure to drafts.").

With regard to training time, the DOT uses two categories; general educational development (GED) and specific vocational preparation (SVP). For the category of general educational development, separate numerical codes are used to describe the degree of reasoning development required (on a scale of 1 to 6), the degree of mathematical development (on a scale of 1 to 5), and language development (on a scale of 1 to 4). Specific vocational preparation is described in terms of the number of years of specific training required for adequate performance of the jobs. For this characteristic, a scale of 1 to 9 is used as follows:

1. short demonstration only
2. short demonstration — 30 days
3. 30 days to 3 months
4. 3 to 6 months
5. 6 months to a year
6. 1 to 2 years
7. 2 to 4 years
8. 4 to 10 years
9. over 10 years

The DOT Supplement lists the fire fighter as requiring a GED reasoning development level of 3. This has recently been upgraded to 4. In terms of mathematical ability the fire fighter's job is rated at the 2 level. A 3 level rating is applied to language development. The code 4 level for reasoning development is described as being able to "apply principles of rational systems to solve practical problems and deal with a variety of concrete variables in situations where only limited standardization exists. Interpret a variety of instructions furnished in written, oral, diagrammatic, or schedule form." In other words, while the fire fighter learns a set of standard techniques for fighting fire, he must be able to exercise judgment as to which fire fighting technique should be used in changing situations.

The rating given the occupation of fire fighter for specific vocational training preparation is 6, or from one to two years preparation. It should be noted however that the U.S. Department of Labor's approved apprenticeship standards for the occupation of fire fighter call for an apprenticeship of from three to four years.

A review of the DOT Supplement indicates that the occupation of fire fighter is unique. Many other occupations have many of the same characteristics, but no other occupation described in the DOT completely duplicates that of the fire fighter in terms of the DOT characteristics. For example, there are similarities between fire fighters and the apprentice trades with regard to physical demands and the level of skills and knowledge required, but the working conditions are different in a number of ways. While some occupations may have working condition factors similar to those of fire fighters, they do not require the same physical demands or educational attainment, or if they require the same educational attainment, they do not impose the same working conditions, etc. The following table, which compares the characteristics of some selected occupations with those attributed to the fire fighter, demonstrates this point.

It is interesting to note that even the job of police patrolman, which is most often compared in the public mind with that of fire fighter, differs in considerable degree, particularly in terms of physical demands and working conditions. Although both are rated the same in terms of general education development and the specific vocational training required, the fire fighter's job requires more physical skills and requires work under more adverse conditions than does the patrolman's job.

Interpreting the Salary Data

A comparison between the fire fighters in City A with the plumbers in City A, for example, is fairly simple and will not require much in the way of interpretation. This is not the case, however, if the comparison includes a number

Comparison of Characteristics of Selected Occupations with those Attributed to a Fire Fighter

DOT Title	Physical Demands						Working Conditions							Training Time	
	1	2	3	4	5	6	1	2	3	4	5	6	7	GED	SVP
Fire Fighter	V	X	X	X	X	X	B		X	X	X	X	X	4	6
Patrolman	M			X	X	X	B					X		4	6
Operating Engineer	M		X	X		X	B				X	X		3	3
Plumber	H	X	X	X		X	B					X		4	7
Iron Worker	H	X	X	X	X	X	B				X	X	X	3	6
Construction Lineman	H	X	X	X	X	X	O					X		4	7

Source: U.S. Department of Labor; Supplement to the Dictionary of Occupational Titles; Physical Demands, Working Conditions and Training Time (1966 Edition).

of the crafts, and if the pay differentials between each group and the fire fighters varies from pennies per hour to dollars per hour, which is likely to be true.

Inter-city comparisons present a similar problem, even when only fire fighter salaries are involved. The data are apt to display wide variations. The negotiating local is likely to have higher pay than some and lower pay than others. It is necessary for the union to be able to interpret such diversity, and to do so with some specificity. The comparisons, in other words, must support an increase of a specific amount and that specific amount should have some relevance to the union's demands.

The two measures that are most widely used for the purpose of comparing and interpreting data are the mean, or average, and the median, as discussed in Chapter 1.

The first step toward good interpretation is frequently the manner of presentation. Assume, for example, that there is some relevance to a comparison of fire fighter salaries for the cities presented below — that is, that there is validity to this particular "universe" of cities:

Baltimore	$34,538
Boston	$43,315
Cleveland	$34,574
Denver	$38,393
Indianapolis	$33,533
New Orleans	$34,881
Phoenix	$40,626
Pittsburgh	$36,601
San Antonio	$37,123
San Francisco	$45,918
Seattle	$39,129

Assume also that the Pittsburgh local is seeking a raise of $1000.

These numbers tell us very little listed this way. After studying them for a while and making some comparisons, we see that Pittsburgh lags behind San Francisco by some $9,317 in salary and behind Denver by $1,792, but that Pittsburgh's salary is higher than that of some of the other cities. However, the way the data is presented above makes useful information difficult to determine. Now consider the following:

San Francisco	$45,918
Boston	$43,315
Phoenix	$40,626
Seattle	$39,129
Denver	$38,393
San Antonio	$37,123
New Orleans	$34,881
Cleveland	$34,574
Baltimore	$34,538
Indianapolis	$33,533
Total	$382,030
Average	$38,203
Median	$37,758
Pittsburgh	$36,601

This is basically the same information with the addition of the mean and median, but in this presentation, the data have been *arrayed* from highest salary to lowest.

It now becomes clear that Pittsburgh's current salary of $36,601 is lower than all but four cities in this universe, and that the proposed pay increase of $1000 would simply bring its salary up to $37,601, or just about up to the median for all cities in the comparison. Furthermore, the increase of $1000 will still leave Pittsburgh's salary well below the average figure of $38,203.

The case for a pay increase could possibly be enhanced by adding a time dimension to the comparison. By examining the salaries of the 10 cities and Pittsburgh for some earlier year or years, it might be discovered that the salary for Pittsburgh had slipped relative to the 10 city average. In short, it might be found that the *increases* received by Pittsburgh have been lagging. This point could be used to strengthen the case in support of the demand for $1000, or to seek an even greater pay increase.

Let us assume for this example that the 1978 salary in Pittsburgh was $17,384 and that the salaries in the other cities that same year were as follows:

San Francisco	$19,990
Boston	$18,905
Phoenix	$18,123
Seattle	$18,053
Denver	$17,090
San Antonio	$17,005
New Orleans	$16,873
Cleveland	$16,770
Baltimore	$16,054
Indianapolis	$16,010

The median for the 10 cities for 1978 is $17,048, and the average is $17,487. The 1978 and 1996 data can be combined into a single table for purposes of presentation.

Table 3–3
Comparison of Salaries of Fire Fighters in Pittsburgh and Ten Comparable Cities as of July 1, 1978 and 1996

	1978	*1996*
San Francisco	$19,990	$45,918
Boston	$18,905	$43,315
Phoenix	$18,123	$40,626
Seattle	$18,053	$39,129
Denver	$17,090	$38,393
San Antonio	$17,005	$37,123
New Orleans	$16,873	$34,881
Cleveland	$16,770	$34,574
Baltimore	$16,054	$34,538
Indianapolis	$16,010	$33,533
Average	$17,487	$38,203
Median	$17,048	$37,758
Pittsburgh	$17,384	$37,601 (proposed)

In 1978, Pittsburgh's salary was $336 above the median salary for the other ten cities of $17,048. The 1996 median is $37,758. Pittsburgh's current salary of $36,601 is $1157 below the 10 cities median; even with the $1000 increase the salary will still be $602 below the 1996 average. If we were to include Pittsburgh in the 1978 salary column, it would rank fifth of the eleven cities; the proposed 1996 salary of $37,601 would place it sixth for that year. This helps to establish that the proposed increase is reasonable and modest.

In essence, the union has sought here to lay claim to a relative position. That is, the union is asserting that its salary today should rank — in relation to the other fire fighter salaries — at or near where it ranked in an earlier period. In this type of approach — subject to the admonition discussed earlier with respect to the comparability issue — the union can also introduce salary comparisons involving a variety of occupations.

Suppose, for example, the fire fighters in Pittsburgh were attempting in 1996 to demonstrate the inequity of their salary by reference to the salary of $34,909 paid the city's building inspectors. In order to make their point the fire fighters would compare the 1996 salaries for fire fighters and building inspectors in all of the cities in the universe. This presupposes that the building inspectors in all of the cities do essentially the same work and that the requirements for the job are similar. Let us assume that the comparison yields the results shown below in Table 3–4.

Table 3–4
Salaries of Building Inspectors and Fire Fighters in Pittsburgh and Ten Comparable Cities as of July 1, 1996

(1)	*(2)*	*(3)*	*(4)*
City	*Fire Fighter's Salary*	*Building Inspector's Salary*	*(2) ÷ (3) X 100 Fire Fighter as a % of Building Inspector*
San Francisco	$45,918	$48,716	94.3%
Boston	$43,315	$39,210	110.5%
Phoenix	$40,626	$36,306	111.9%
Seattle	$39,129	$34,626	113.0%
Denver	$38,393	$34,164	112.4%
San Antonio	$37,123	$33,427	111.1%
New Orleans	$34,881	$31,727	109.9%
Cleveland	$34,574	$31,334	110.3%
Baltimore	$34,538	$34,450	100.3%
Indianapolis	$33,533	$30,892	108.5%
Average Percentage			108.2%
Median Percentage			110.4%
Pittsburgh (current)	$36,601	$34,909	104.8%
Pittsburgh (proposed)	$37,601	$34,909	107.7%

The current Pittsburgh fire fighter's salary of $37,601 amounts to 104.8 percent of the inspector's salary ($36,601 ÷ $34,909 = 1.048 = 104.8%). This indicates that the fire fighter's salary is low relative to the inspector's salary. The average relationship in the other cities in the universe is 108.2%; the median, a measure of central tendency that will overcome the "distortions" created by the more extreme values such as Seattle at 113.0% or San Francisco at 94.3%, is 110.4%

The important point, however, is not the relationship represented by the salaries that are in actual existence. For bargaining purposes the union must demonstrate what the impact of its *demand* will be.

The proposed $1000 increase would raise the Pittsburgh salary to $37,601. That would produce a salary relationship of fire fighter to inspector of 107.7%, just below the ten city average of 108.2% and well below the ten city median of 110.4%. (If we were to rank the percentages from highest to lowest and include Pittsburgh, it ranks ninth, even including the proposed increase.)

If the Pittsburgh fire fighters were to be paid according to the median relationship of 110.4%, their salary should be set around $38,540 (inspector's salary of $34,909 x 1.104), which is $939 more than the union is seeking in this case.

Support for the proposed pay increase could conceivably be strengthened by reference to trends in recent years. Suppose, for example, that 1978 data is shown in the following table.

Table 3–5
Salaries of Building Inspectors and Fire Fighters in Pittsburgh and Ten Comparable cities as of July 1, 1978

(1)	*(2)*	*(3)*	*(4)*
City	*Fire Fighter's Salary*	*Building Inspector's Salary*	*(2) ÷ (3) X 100 Fire Fighter as a % of Building Inspector*
San Francisco	$19,990	$21,991	90.9%
Boston	18,905	17,281	109.4%
Phoenix	18,123	16,081	112.7%
Seattle	18,053	16,249	111.1%
Denver	17,090	14,720	116.1%
San Antonio	17,005	15,009	113.3%
New Orleans	16,873	15,187	111.1%
Cleveland	16,770	14,960	112.1%
Baltimore	16,054	15,246	105.3%
Indianapolis	16,010	14,810	108.1%
Average Percentage			109.0%
Median Percentage			111.1%
Pittsburgh	$17,384	$15,452	112.5%

(We have not always done so in our examples because some of the data used is hypothetical, but when preparing information for purposes of negotiation, always include the source of your data. This is particularly important if there are a number of tables and several sources of data. Without source information, even the union may forget where numbers originated. Moreover, a third-party neutral is not likely to give much weight to unidentified data sources, and the employer may insist on the opportunity to verify data presented by the union.)

There has obviously been some shifting about between 1978 and 1996 in the fire fighter to inspector salary relationships between and among the cities in our universe. This is to be expected, and it is the reason that measures of central tendency are so important. They permit such diverse movements to be interpreted with relative ease.

The following table is an example. It contains nothing more than the "bottom line" figures from the two preceding tables.

Table 3–6
Percentage Relationship of Salaries of Fire Fighters and Building Inspectors in Pittsburgh and Ten Comparable Cities, as of July 1, 1996

	1978	*1996*
Ten City Average	109.0%	108.2%
Ten City Median	111.1%	110.4%
Pittsburgh	112.5%	107.7%*

*After proposed increase of $1000

Table 3–6 shows that in 1978 the fire fighter in Pittsburgh received a salary that was 112.5 percent of the inspector's salary, and that this relationship ranked above the 10-city median that year of 111.1 percent. In other words, compared to these other cities, the building inspector fared less well, in relationship to the fire fighter, in Pittsburgh.

In 1996, however, the reverse would be true even after the fire fighters received their proposed increase. If the fire fighters were to maintain their 1978 relationship to the building inspectors (112.5 percent) their 1996 salary would have to be $39,273 ($39,273 ÷ $34,909 = 112.5 percent), or an increase of $2,672. But they are seeking a salary of $37,601, an increase of only $1000.

The proposed salary figure of $37,601 would leave the fire fighter at 107.7 percent of the inspector's salary — which would represent a slippage from the 1978 figure of 112.5 percent.

Among the other 10 cities, the relative position of the fire fighter had declined to a point where the median percentage relationship was 110.4 percent in 1996, compared to 111.1 percent in 1978.

Furthermore, in 1978, Pittsburgh's relationship was above the 10 city median (the Pittsburgh fire fighter had a relatively higher salary), but the proposed 1996 relationship — after the $1000 increase — would leave it below the 10-city median (the Pittsburgh fire fighter would have a relatively lower salary).

Thus, there are many points that can be made from these comparisons to demonstrate that the union's demand is reasonable, or, if the need were there, to justify a demand somewhat in excess of $1000. And, as has already been stated, the case need not revolve around the union's ability to document that it should have the same pay level as some other group. Persuasive arguments can be developed on the basis of the union's claim to a relative position, be it in relation to the pay of fire fighters in other cities, or in relation to the pay of some altogether different occupation.

Problems of Comparability of Salary Data

Several of the problems affecting the comparability of data have already been mentioned. In some instances, it is possible to overcome some of the defects with just a little effort and imagination. In other cases, little can be done to remedy the situation, and the data simply cannot be used profitably or, at least, not as profitably as the union might hope. Sometimes, of course, the discrepancies may be of such little consequence that they can be ignored.

JOB CONTENT — For a variety of reasons, the job of a fire fighter may not only be not comparable to other occupations, it may not be comparable to the jobs of fire fighters in other cities. As has been pointed out, comparisons in such circumstances can focus on the relative positions of the salaries, in order to avoid an endless debate over the comparability question.

Sometimes, of course, in order to justify its demand, the union will have to — and will want to — establish the fact of comparability between itself and some other group. In order to do so, it will be necessary to show that there is indeed substantial similarity in the level of skill and/or type of work involved in the occupations whose salaries are being compared.

If the similarity does not exist, then the comparison is flawed. The salaries in such comparisons are not comparable, because the jobs are not comparable.

HOURS OF WORK — Occupational content is not the only factor that may affect comparability. The jobs may be the same or similar, but the hours of work may be different.

Suppose, for example, that the fire fighters in City A and in City B are both paid $30,000 per year. In any comparison of annual salaries, they would show up the same. Obviously, however, the group with longer hours has a lower hourly "rate of pay".

The solution here is relatively simple. The annual salaries can be converted to hourly rates, by dividing the fire fighter's scheduled hours per year into the annual salary. This places the data for both cities on a common base — the rate per hour — and makes a comparison valid.[4]

PROGRESSION SCHEDULE — The tendency in most fire service pay negotiations is to key on the salary for the fire fighter private at maximum, but without longevity. The

4. The discussion in this text has focused on the use of annual salary data in making comparisons. As is indicated it may sometimes be desirable and/or necessary to convert annual salary data to their hourly equivalents in order to make those comparisons. It should be noted, too, that there may be occasions when it will be desirable to use both approaches.

practice is to compare salaries at the level among whatever cities are considered to comprise an appropriate universe. The duration of the progression schedule — that is, the amount of time required to advance from the entry salary to the maximum without longevity — may be different in each of the cities. Obviously, the fire fighters in the cities with the shorter progression schedules have an advantage.

WORKLOAD AND STAFFING — Differences in workloads and/or staffing requirements can represent distinctions of considerable importance in connection with salary comparisons of fire fighters in different cities.

The populations of two cities may be similar, but the fire fighter's job may be considerably harder in one of them. To an extent, some of the differences, such as fire fighting in a residential community versus an industrial community, may not be measurable. But differences in the total number of runs, and in the number of active and false alarms, do provide the basis for making some distinctions.

Thus, the number of alarms per fire fighter, per year, is a measurement that may perhaps be made to establish the degree of comparability of the jobs of fire fighters in different cities.

Such a measurement may also help to pinpoint underlying distinctions that may exist because of differences in staffing requirements. One of the cities, for example, may run its equipment with fewer fire fighters and, as a result, have a smaller department. In such a case, assuming the two cities experience the same number of alarms, the city with the smaller department has a greater workload per fire fighter.

If, for example, City A and City B each responded to 6,000 alarms during the year, but City A operated with 65 privates and City B with 75, the computation would be as follows:

City A: 6,000 alarms ÷ 65 fire fighters = 92.3 alarms per fire fighter
City B: 6,000 alarms ÷ 75 fire fighters = 80 alarms per fire fighter

Obviously, the validity of this comparison depends on City A not having proportionately more officers in its department than City B has. If it is possible that the departmental structures are substantially different, it would be preferable to use the figures on the total number of uniformed personnel, privates and officers.

However, it is still very possible for the two departments to be very different with respect to workload and staffing. For example, the scope of the work of the two departments may differ. In one, uniformed personnel may be responsible for communications or perhaps inspection of alarm boxes, while these functions may be assigned to civilian personnel in the other. One department may operate an ambulance service while the other may not. In other words, in one city uniformed personnel may have responsibilities which civilian personnel handle in another.

The fact that some departments do have a broader scope of work than others will sometimes help account for apparent discrepancies in department sizes between cities. The union should be alert to these possible differences as it compiles data for its presentation. This information may well be needed to respond to data presented by management.

TIME SPAN DIFFERENCES — Only rarely will the union find that data for different groups and/or cities will fit together, in terms of time periods, as neatly as they do in the examples. More likely than not, the pattern of effective dates of the pay scales will not be uniform from one city to the next. Moreover, it would not be at all unusual to find, for example, that for any given city the 1978 salary might have been effective in an altogether different month of the year than was the 1996 salary.

The reality of the situation, therefore, is that some of the entries in Table 3–3 could reflect time spans of more than eighteen years, and some less than eighteen years. A salary in effect on July 1, 1978 might easily have been set as early as August 1, 1977. If that unit's 1978 salary were established as of August 1, 1977, then the span of time covered by its two salary figures is not eighteen years — which is implied in Table 2–1 — but only one month short of nineteen years.

At the other extreme, a 1978 salary set as of July 1, 1978, and a 1996 salary set as of August 1, 1995, would involve a span of just over seventeen years. In other words, even though the data in Table 3–3 appear to be comparable with respect to time, the fact is that the time spans could range from seventeen years and one month to eighteen years and 11 months.

If the true time spans included in the salary data do contain such variations, comparisons which do not take this into account will be misleading.

Table 3–7 has been constructed to show how this might be done. (Note that the data is for purposes of this example; it is not precise.)

Table 3–7
Comparison of Salaries of Fire Fighters in Pittsburgh and Ten Comparable Cites in 1978 and 1996

City	(1) 1978	(2) 1996	(3) % Increase 1978–96	(4) Effective Months 1978/1996	(5) Number of Months	(6) % Increase Average Per Month
San Francisco	$19,990	$45,918	129.7	July/Jan	210	.618
Boston	$18,905	$43,315	129.1	July/July	216	.598
Phoenix	$18,123	$40,626	124.2	Oct/Jan	207	.600
Seattle	$18,053	$39,129	116.7	July/July	216	.540
Denver	$17,090	$38,393	124.7	Feb/Nov	225	.554
San Antonio	$17,005	$37,123	118.3	Dec/Jan	205	.577
New Orleans	$16,873	$34,881	106.7	July/July	216	.494
Cleveland	$16,770	$34,574	106.2	July/Jan	210	.506
Baltimore	$16,051	$34,538	115.2	July/Jan	210	.549
Indianapolis	$16,010	$33,533	109.5	Nov/Jan	206	.532
Average			118.0			.557
Pittsburgh	$17,384	$37,601	116.3	Jan/Jan	216	.538

The most significant outcome from Table 3–7 is the difference in the results in column (3) as contrasted to column (6). While the proposed salary increase for Pittsburgh would generate a total increase of 116.3 percent since 1978—as compared to an average of 118.0 percent for the other 10 cities—the picture changes when the different time spans are figured into the calculation.

For Pittsburgh, the total increase of 116.3 percent would amount to an average of .538 percent per month. The average for the other 10 cities, however, works out to a larger figure — .557 percent per month — which once again indicates the modest nature of the proposed increase for Pittsburgh.

AVERAGE EARNINGS STATISTICS — The most relevant type of data to be used in wage or salary comparisons for collective bargaining are actual pay scales. Pay scales, whether by the hour, week, or year, are clean and uncluttered. They represent the basic rate of pay for the jobs or occupations to which they apply.

Average earnings, however — even average straight time earnings (that is, with overtime premium payments removed) — are usually of an altogether different breed. This does not mean that data on average earnings should never be used. But it most certainly does mean that they should be used only with great care, and with an awareness that they have shortcomings. This is not a matter of the accuracy of the data. It is, instead, a question of relevance. By their very nature, average earnings data are usually a measurement of something other than the basic job rates.

Compilation and publication of average earnings data for a wide array of different occupations and different industries, are an important part of the activities of the U.S. Bureau of Labor Statistics. Among these are the Area Wage Surveys, which are prepared annually for approximately 85 individual metropolitan areas. These surveys provide on average straight-time hourly earnings for numerous production, maintenance, clerical, and technical occupations within each of the communities surveyed. Data from these surveys or from similar surveys by State agencies, often find their way onto the bargaining table.

Because the occupations covered by these Area Wage Surveys are remote to the job of fire fighters, employers do not necessarily use these data to make salary comparisons. Instead, they tend to employ the data from these surveys to make comparisons over time to show that the pay increases received by the fire fighters exceed the pay increases received by other workers in the community. Since the Area Wage Surveys for each of the 85 communities are published each year, this is a fairly simple kind of comparison to produce.

But it is a comparison that may be misleading, for it entails comparing the increases in the fire fighter's pay scale with the increase in the average earnings reported for the occupation(s) in the Area Wage Surveys. And a tendency toward a downward bias in wages is an inevitable by-product of the method used to produce the Area Wage Survey figures, explained in the next section on current year weighting.

Moreover, it must be noted, the Area Wage Surveys include data from both union and non-union establishments. In fact, in some communities, the non-union group may comprise a majority of the establishments in the survey. And this, no doubt, produces some additional downward bias in the data.

How to Calculate Current Year Weighting

In most respects, weighting data produces a more precise measure of central tendency than a simple average. Even so, there are problems with some of the weighted data frequently presented in negotiations. The major problem arises due to what is called current year weighting.

"Current year" employment weights are used, for example, by the Bureau of Labor Statistics in the compilation of just about all of its statistics on workers' earnings in different industries and occupations (this should not be confused with "pay scales" or "wage rates"). Although technically quite sound, this method has an impact on the resulting data that union representatives need to understand.

One of the Bureau's major wage survey programs involves the collection and publication each year of average straight-time hourly earnings for a wide variety of job titles, covering work in maintenance and production, in service occupations, and in technical and clerical fields. These surveys are conducted for approximately 85 separate communities, and are known as *Area Wage Surveys*. Data from these surveys often find their way onto the bargaining table.

Where fire fighters are concerned, it would be unusual for the management side of the bargaining table to attempt to employ such data to compare wage or salary *levels*. There are no occupations covered by these surveys that are comparable to the job of a fire fighter.

More likely, these data would be used to compare *increases*, that is, the increases received by the fire fighters in the community over a given period of time, as compared to the amount of increase in the average straight time hourly earnings during the same period for one or more of the occupational titles included in the Area Wage Surveys.

Frequently, the result is adverse to the fire fighters. These comparisons may show that the increases in the fire fighter's pay scale in the city have exceeded the increases in average earnings registered in the BLS surveys for other occupations in the same area.

This may, in fact, be true. The increase in the fire fighter's pay scale may indeed be greater. But the higher figure could also be produced by the underlying difference in the concepts behind the BLS average earnings data and the negotiated rate of fire fighter's salary scale.

The problem with the average earnings statistics stems from the weighting process. As will be shown below, these data are not only influenced by changes in pay levels (increases in wages) but also by employment trends.

In general, when the nation's employment is rising, the rate of increase in the BLS average earnings data tends to be restrained. But when employment is not rising, or when unemployment increases, the tendency is for these earnings data to exhibit an upward bias. The reasons for this oddity can be demonstrated.

Suppose that in 1995 a city's fire department had 45 privates distributed as follows:

	Number of Privates	*Annual Salary*	*Weighted Payroll*
Private, step 1	5	$29,000	$145,000
Private, step 2	15	$31,000	$465,000
Private, maximum	25	$33,000	$825,000
Totals	45		$1,435,000

The weighted average salary for these fire fighters is

$1,435,000 ÷ 45 = $31,889.

Now consider two alternative changes in the employment mix in the next year, 1996, at the same time that we apply a negotiated salary increase of ten percent. Under alternative #1, there is no change in the number of employees, but the five privates in step 1 advance to step 2, in turn, five of the 15 in step 2 advance to the maximum, two retire, and there are two new hires. Under this alternative, the employment distribution and salary scales (after a pay increase of ten percent) would be as follows:

Alternative #1

(1) Classification of Privates	*(2) Distribution of Privates*	*(3) Annual Contractual Salary After 10% Raise*	*(4) Weighted Payroll (2) X (3)*
Private, step 1	2	$31,900	$63,800
Private, step 2	15	$34,100	$511,500
Private, maximum	28	$36,300	$1,016,400
Totals	45		$1,591,700

Weighted Average Salary: $1,591,700 ÷ 45 = $35,371

In this scenario, the unit's pay raise was only ten percent. However the *increase* in the weighted average salary is 10.9 percent, calculated as follows:

($35,371 - $31,889) ÷ ($31,889) x 100.

Under alternative #2, assume the same changes that occurred under alternative #1 plus the hiring of eight new privates. This new distribution is shown below.

Alternative #2

(1) Classification of Privates	*(2) Distribution of Privates*	*(3) Annual Contractual Salary After 10% Raise*	*(4) Weighted Payroll (2) X (3)*
Private, step 1	10	$31,900	$319,000
Private, step 2	15	$34,100	$511,500
Private, maximum	28	$36,300	$1,016,400
Totals	53		$1,846,900

Weighted Average Salary is $1,846,900 ÷53 or $34,847

The weighted average salary in this case is $34,847. Under alternative #2, which included the ten percent pay raise as well as an expansion in employment at the entry level, the weighted average salary is less than the weighted average salary under alternative #1. In addition, the increase in the weighted average salary for alternative #2 is only ($34,847 - $31,889) ÷ $31,889 x 100 or 9.3 percent.

The basic reason for the lower rate of increase under alternative #2 is simply the growth in employment *and* the fact that such growth typically occurs at the entry levels. Since salaries for entry-level workers are lower than for other levels, the process of employment growth tends to retard the growth in the weighted average salary.

The weights used in these calculations were "current year" weights. The 1995 salaries were weighted by the 1995 distribution of employment — that is, by the employment figures "current" in 1995 — and the 1996 salaries were weighted by the 1996 employment figures, i.e., "current" for 1996.

Except in times of deep economic distress, employment in the United States has increased from one year to the next. That employment growth has a downward impact on the earnings data that BLS derives through the Area Wage Surveys. This is because the increase in employment is typically fed into the economic system at the entry levels. Essentially, new entrants are pumped in at a faster rate than other workers; the more senior workers, who tend to be higher paid, leave the system through death and/or retirement. As a result, the system, in terms of numbers of employees, is constantly being weighted toward the lower end of the wage spectrum.

The BLS data on earning are influenced by this downward pull because they are weighted according to the numbers of workers at each wage level of the occupation in the "current year". As was shown above in the example, that process of weighting tends to conceal the rate at which the pay scales may actually be increasing. In our example, because of the growth of employment, the weighted average salary increased by only 9.2 percent between 1995 and 1996, even though every pay scale was raised by ten percent.

Chapter IV:
Calculating Compensation Costs *

Compensation consists of both salaries and/or wages, and fringe benefits. It encompasses all direct forms of wage payments (including, for example, bonuses, commissions, and incentive payments), as well as the cost to the employer of all types of fringe benefits (such as pensions, health insurance, and vacations). Technically, employee compensation may also include the cost of legally required employer payments for programs such as social security, unemployment compensation, and worker's compensation. These items are disregarded in this analysis.

To effectively bargain for compensation, the union must compute the actual cost to the employer of present compensation received and the cost of any proposed increase in this compensation. The most relevant statistic is the unit's average compensation, or, more specifically, its weighted average compensation, discussed in Chapter 1. The weighted average compensation (hereafter referred to as "average compensation", or simply "compensation"), tells how much it costs the employer, on the average, for each person on the payroll. It is this figure which the union presumably intends to increase through negotiations.

Although it is not always possible to precisely compute all compensation costs, it is possible for the union to develop some reasonably accurate approximations on its own. The ability to do this is important in judging whether a settlement proposal is or is not satisfactory. Moreover, an awareness of the concepts and techniques involved in these computations can prove invaluable to the union in carrying on the bargaining dialogue with the employer and/or a third party neutral. These computations, therefore, are not just mathematical exercises; they yield information that is useful at the bargaining table. The union wants to know the value of its salaries and fringe benefits primarily so that it can judge the value of any bargaining offer or settlement. Logically, therefore, it wants to know the base compensation costs as of the time of negotiations, or, more accurately, immediately prior to an increase.

Information to Calculate Compensation Costs

The essential information needed to compute compensation costs includes:

- the salary scales and benefit programs, and
- the distribution of the employees in the unit according to pay steps and shifts, and according to length of service.

With this information, all types of compensation costs can be easily computed with the exception of the overtime premium. Overtime is apt to vary widely from week-to-week or month-to-month and may cost the employer more one week than the next, so the data for any one pay period is an inadequate measure for overtime. It is common practice to cost-out the overtime premium by averaging the cost of that benefit over the prior 12 months.

However, it is not necessary to study a full year's experience with salaries, vacations, holidays, etc. Costs can be based on a snapshot of the provisions in the current collective bargaining agreement and the current distribution of the employees in the bargaining unit. Typically, as noted earlier, the computation should be based on compensation costs as of the time the parties will be at the bargaining table.

The purpose of this chapter is to provide guidance on how to calculate current compensation and how to calculate the cost to the employer and the value to the bargaining unit of an increase in compensation.

The next section discusses how to calculate compensation costs. Table 4–1 on the next page gives the basic information needed to calculate these costs for a sample bargaining unit.

* This Chapter looks at costing existing and proposed contracts from a *contractual* viewpoint. We are not attempting to cost on a *budgetary* basis.

Table 4–1
Sample Bargaining Unit

1. Employment and Salaries

Classification	*Number of Fire Fighters*	*Salary Scale*
Probationary		
Step 1	5	$29,000
Step 2	10	$30,000
Private	65	$32,000
Lieutenant	15	$35,200
Captain	5	$38,400
	100	

2. Longevity Payments

Longevity Step	*Number of Fire Fighters*	*Longevity Pay*
Step 1	20 Privates	$500
Step 2	10 Privates	$1000
Step 2	15 Lieutenants	$1000
Step 2	5 Captains	$1000

3. Hours of Work
The scheduled hours consist of one 24-hour shift every three days (one on; two off), or an average of 56 hours per week and a total of 2,912 hours per year.

4. Overtime Premium
All overtime hours are paid at the rate of time-and-one-half. The sample bargaining unit is assumed to have worked a total of 5,000 overtime hours during the preceding year.

5. Shift Differential
The shift differential is 10 percent of all hours worked between 4 p.m. and 8 a.m. However, 10 members of the unit work exclusively on the day shift, from 8 a.m. to 4 p.m.

6. Vacations
15 employees ——— 5 shifts
35 employees ——— 10 shifts
50 employees ——— 15 shifts

7. Holidays*
Each Fire Fighter is entitled to 10 paid holidays and receives 8 hours pay for each holiday.

8. Hospitalization

Type of Coverage	*Number of Fire Fighters*	*Employer's Monthly Payment*
Single Coverage	15	$250
Family Coverage	85	$400

9. Clothing Allowance
$150 per employee per year.

10. Pensions
The employer contributes an amount equal to eighteen percent of the payroll. (including basic salaries, longevity, overtime and shift differentials)

* In this example, it is assumed that there is no sick leave, or any other kind of paid leave except vacations and holidays. This is solely for purposes of simplification, since the costing-out of a day of used sick leave is, in reality, no different than the costing-out of any other type of paid leave.

Computing Base Compensation

Base compensation refers to the existing compensation. Before we can measure the value of an increase in compensation, it is necessary to develop a base compensation figure. For example, a pay increase of $1000 per person means something different to a bargaining unit whose existing salary and fringe benefit cost per employee amounts to $40,000 per year than it does to a unit whose cost is $30,000. In the second case it represents an increase of 3.33 percent, but if the base is $40,000, it amounts to only a 2.5 percent increase. Thus, the base compensation figure is essential in determining the percentage value of any increase in compensation.

To demonstrate how to determine base compensation figures we will use the fictitious sample bargaining unit constructed in Table 4–1. We can now compute the cost of compensation for the average employee.

AVERAGE STRAIGHT TIME PAY

The average straight time pay for any bargaining unit is the weighted average of each different group of salary scales. Table 4–2 represents the average straight time salary for our sample bargaining unit.

Table 4–2
Average Straight-Time Salary

(1) Classification	(2) Number of Fire Fighters	(3) Salary Scale	(4) Weighted Salaries (2) x (3)
Probationary			
Step 1	5	$29,000	$145,000
Step 2	10	$30,000	$300,000
Private	65	$32,000	$2,080,000
Lieutenant	15	$35,200	$528,000
Captain	5	$38,400	$192,000
Totals	100		$3,245,000

Average Annual Basic Salary = $3,245,000 ÷ 100; or $32,450

LONGEVITY PAY

Average longevity pay is calculated using the weighted average of each different group of longevity steps. Table 4–3 shows how the average annual longevity pay for our sample bargaining unit is computed.

Since the unit is trying to determine the *average* base of all the salary and fringe benefit items its members receive collectively, the total cost of longevity pay must be averaged over the entire unit of 100. This is why the weighted total of $40,000 is divided by 100 instead of by the 50 fire fighters that are receiving longevity pay.

Table 4–3
Average Longevity Pay

(1) Longevity Step	(2) Number of Fire Fighters	(3) Longevity Pay	(4) Total Longevity Pay (2) x (3)
Step 1	20	$500	$10,000
Step 2	30	$1000	$30,000
Totals			$40,000

Average Annual Longevity Pay = $40,000 ÷ 100; or $400 per year

Now, by adding the average straight-time salary to the average longevity pay, we can calculate the average wage paid to an employee per year, excluding overtime and shift differentials.

We can also find the average hourly rate for each employee by dividing the average wage by the number of hours each employee worked. This average hourly rate, excluding overtime and shift differentials, is needed to compute the cost of many wage-related benefits.

The calculations for both the average wage and average hourly rate for our sample bargaining unit can be seen in Table 4–4.

Table 4–4
Average Wage And Hourly Rate Per Year (excluding overtime and shift differential)

To calculate the average wage paid to an employee per year, excluding overtime and shift differentials, add the average straight time salary and the average longevity pay.

Average Wage = $32,450 + $400; or $32,850

To calculate the average hourly rate, excluding overtime and shift differentials, divide the average wage by the number of hours worked.

Average Hourly Rate = $32,850 ÷ 2912*; or $11.28

*The figure 2912 comes from Table 4–1, item number 3, "Hours of Work"

AVERAGE COST OF OVERTIME

Overtime hours are assumed to be paid at the rate of time and one-half. This means that part of the total overtime cost is paid at straight time rates and part is a premium payment. Table 4–5 breaks down overtime pay into the straight time cost, using the average hourly rate from Table 4–4, and the overtime premium.

Table 4–5
Average Cost of Overtime

	(1) *Annual Cost*	*(2)* *Number of Fire Fighters*	*(3)* *Average Annual Cost (1) ÷ (2)*
Straight-time Cost ($11.28 per hour X 5,000 overtime hours)	$56,400	100	$564
Half-time Premium Cost (1/2 of $56,400)	$28,200	100	$282
Total Overtime Cost	$84,600	100	$846

To calculate the average pay at straight-time rate, add the average straight time salary, the average longevity pay, and the average annual cost of straight-time overtime. (See Table 4–6.)

Table 4–6
Total Straight-Time Pay

Average Pay at Straight-Time= $32,450 + $400 + $564; or $33,414

Note that the total straight time pay uses just the straight time cost for overtime and not the premium cost.

AVERAGE COST OF SHIFT DIFFERENTIAL

The sample bargaining unit receives a shift differential of ten percent for all hours worked between 4 p.m. and 8 a.m. However, ten members of the unit who work in headquarters are assumed to work hours that are not subject to the differential. This leaves ninety employees who receive the differential.

Since the differential is paid for hours worked between 4 p.m. and 8 a.m. and this time period is two-thirds, (or .667), of a normal twenty-four hour shift, then it costs the employer two-thirds of ten percent for each twenty-four hour period. This can be seen in column 5 of Table 4–7. Each employee receives the differential for only two-thirds of his twenty-four hour tour.

Table 4–7
Average Cost of Shift Differential

(1) *Classification*	*(2)* *Number on Shift Pay*	*(3)* *Salary Scale*	*(4)* *.10 of Col. (3)*	*(5)* *.667 of Col. (4)*	*(6)* *Total Cost (2) x (5)*
Probationary					
Step 1	5	$29,000	$2,900	$1,934.30	$9,671.50
Step 2	10	$30,000	$3,000	$2,001.00	$20,010.00
Private					
Longevity-0	35	$32,000	$3,200	$2,134.40	$74,704.00
Longevity-1	17	$32,500*	$3,250	$2,167.75	$36,851.75
Longevity-2	7	$33,000*	$3,300	$2,201.10	$15,407.70
Lieutenant	12	$36,200*	$3,620	$2,414.54	$28,974.48
Captain	4	$39,400*	$3,940	$2,627.98	$10,511.92
Totals	90				$196,131.35

Average Annual Cost of Shift Differential = $196,131.35 ÷ 100;** or $1,961.31 per year

* Basic salary plus longevity pay.

**Note: The unit is trying to determine the average base compensation that all its members receive collectively. As such, the total cost of the shift differential must be averaged over the entire unit of 100 instead of the 90 members that actually receive it. This is why total annual cost of shift differential is divided by 100 instead of 90.

Table 4–8
Average Cost of Vacations

(1) Classification	(2) Number of Fire Fighters	(3) Hourly Rate*	(4) Hours of Vacation**	(5) Total Vacation Hours (2) X (4)	(6) Total Vacation Costs (3) X (5)
Probationary					
Step 1	5	$9.959	120	600	$5,975.40
Step 2	10	$10.302	120	1,200	$12,362.40
Private					
Longevity-0	35	$10.989	240	8,400	$92,307.60
Longevity-1	20	$11.161	360	7,200	$80,359.20
Longevity-2	10	$11.332	360	3,600	$40,795.20
Lieutenant	15	$12.431	360	5,400	$67,127.40
Captain	5	$13.530	360	1,800	$24,354.00
Totals	100				$323,281.20

Average Annual Vacation Cost = $323,281.20 ÷ 100; or $3,232.81 per year

* Derived from annual salaries (including longevity pay), divided by 2,912 hours (56 hours X 52 weeks).
** This example ignores the fact that 10 members of the sample bargaining unit were earlier assumed to be working five-days, 40-hours (see the computation for the cost of the shift differential). For a more precise computation, it would be preferable to compute the cost of the vacation benefit for those 10 separately from the vacation cost of the other 90 members of the unit in seeking to arrive at the unit's total average cost. Here, it was simply assumed that all 100 members of the unit worked 24 hours on and 48 hours off.

Also note that the average cost of a shift differential is also the weighted average of each different group of salary scales calculated with the given shift differential.

AVERAGE COST OF VACATIONS

Vacation costs for the unit are influenced by the amount of vacations received by the employees with differing lengths of service and the pay scales of those employees.

The cost of vacations is calculated by multiplying the total number of hours of vacation by the respective hourly rate derived from the salary scales. From these computations, the average cost of vacation can be computed. Table 4–8 shows how the average cost of vacation was calculated for the sample bargaining unit.

AVERAGE COST OF PAID HOLIDAYS

Unlike vacations, the number of holidays received by an employee is not tied to his length of service. Where the level of benefits is the same, as it is with paid holidays, the calculation to determine its average cost is easier.

In the sample bargaining unit, it is assumed that each fire fighter receives 8 hours of pay for each of his 10 paid holidays. This means that each member of the unit receives a total of 80 hours of holiday pay per year.

Table 4–9 shows how to calculate the total annual cost of paid holidays for the unit as well as the average annual cost of paid holidays for each employee.

Table 4–9
Average Cost of Paid Holidays

The total number of paid holiday hours is 8,000, (80 hours x 100 employees).

To find the total annual cost of paid holidays, multiply the unit's average straight-time hourly rate by the total number of paid holiday hours for the unit.

Annual cost of paid holidays = $11.28 x 8000 hours; or $90,240.

To find the average annual cost of paid holidays, divide the annual cost of paid holidays by the number of members in the unit.

Average Annual cost of paid holidays = $90,240 ÷ 100 employees; or $902.40 per employee.

AVERAGE COST OF HOSPITALIZATION

The average cost of hospitalization is the weighted average of each different type of hospitalization coverage.

Table 4–10 shows the calculations for the average cost of hospitalization for our sample bargaining unit.

Table 4–10
Average Cost of Hospitalization

(1)	*(2)*	*(3)*	*(4)*
Type of Coverage	*Number of Fire Fighters*	*Yearly Premium Cost to Employer*	*Total Cost to Employer (2) x (3)*
Single	15	$3,000	$45,000
Family	85	$4,800	$408,000
Totals	100		$453,000

Average Annual Cost of Hospitalization = $453,000 ÷ 100; or $4,530.00 per employee.

AVERAGE COST OF OTHER FRINGE BENEFITS

Finally, you will need to calculate the average cost of any other benefits. In our sample bargaining unit, these would include clothing benefits and pension benefits.

The average annual cost for clothing allowance for each fire fighter was given as $150 per year for each employee.

The calculation for the average cost of pensions per fire fighter is shown in Table 4–11.

Table 4–11
Average cost of pension

Pensions cost the employer 18 percent of payroll. The payroll can be calculated by totaling the annual salary cost, the annual longevity cost, the overtime cost, and the annual shift differential cost for the unit. This amounts to $3,565,731.35. (salary cost – $3,245,000; longevity
cost – $40,000; overtime cost – $84,600; and shift differential cost – $196,131.35)

The cost of pensions per year for the employer would be $3,565,731.35 x 0.18 = $641,831.64

The average cost of pensions per fire fighter, per year is $641,831.64 ÷ 100; or $6,418.32 per employee.

Average Annual Base Compensation

Finally, using the information that you have obtained from your calculations, you can compute the average annual base compensation for your unit.

Table 4–12 shows the average annual base compensation for our sample bargaining unit.

When the base compensation costs have been determined, it is possible to compute the cost of any increase in the items of compensation. The methods used to make these computations are essentially the same as those used to compute the base compensation data. The following section will show how to determine these costs.

Table 4–12
Average Annual Base Compensation for the Sample Bargaining Unit

The recapitulation below indicates total compensation — salary plus fringe benefits — for each fire fighter per year.

Straight-time Earnings	$33,414.00
Basic Salary	$32,450.00
Longevity pay	$400.00
Overtime*	$564.00
Fringe Benefits	$17,476.84
Overtime premium	$282.00
Shift Differential	$1,961.31
Vacations	$3,232.81
Holidays	$902.40
Hospitalization	$4,530.00
Clothing Allowance	$150.00
Pension	$6,418.32
Total	$50,890.84

* This is only the straight time portion of overtime pay. The premium portion appears with the fringe benefits.

Computing the Cost of Increases in Items of Compensation

When computing the cost of a settlement, begin with the cost-impact of the salary increase and then calculate the cost-impact of the increases in fringe benefits. This is necessary because the increase in salaries is needed to compute the increase in fringe benefits.

To demonstrate how to cost-out any increases in compensation for our sample bargaining unit, assume that the sample bargaining unit is negotiating a settlement that includes the following:

1. an increase of 5 percent in basic salaries,
2. two additional shifts of vacation for all those at the second step of longevity, and
3. an improvement in the benefits provided by the hospitalization program, which will cost the employer an additional $24.00 per month for family coverage and $15.00 for single coverage.

INCREASE IN COST OF SALARIES

As stated above, start with the cost impact of the salary increase. For our sample bargaining unit, the increase in average annual basic salary would be $1,622.50, (.05 x $32,450.00).

It should be noted that the cost of longevity pay does not increase. This is because longevity increments for the unit are fixed dollar amounts. If these payments were based on a percentage of salary, then the cost of the longevity payments would also rise by 5 percent. However, as a fixed dollar amount, these payments remain unaffected by the increase in basic salaries.

As a result, the increase in the unit's total average basic salary, ($32,450.00 in basic salary plus $400 in longevity), is in reality, not 5 percent but only 4.9 percent, ($1,622.50 ÷ $32,850).

The difference in this percentage increase is important because of the way in which pay increases impact the cost of fringe benefits. This impact is commonly referred to as the "roll-up". As salaries increase, so does the cost to the employer of fringes that are based on the wage rate, such as vacations, holidays, and overtime premiums. This increase in cost comes even though the actual benefits are not improved.

Some fringes, however, are not subject to the "roll-up." This is the case with respect to those fringe benefits that are not linked to pay rates. Examples of this type of fringe benefit include shift differentials that are stated in cents-per-hour, (in contrast to a percentage of salary), a flat clothing allowance, and most group insurance programs.

COST OF IMPACT OF ROLL-UP

Since the increase in average straight-time pay, (basic salary plus longevity pay), of the sample bargaining unit was shown to be 4.9 percent, the average cost of every benefit linked to salary will likewise increase by 4.9 percent. In our example, the average cost of compensation will go up by $1,622.50 per year in salaries, plus however much is added to the costs of the fringe benefits as a result of the "roll-up."

However, there is more involved to the cost of the increase in the fringe benefits than just the "roll-up". In our example, it is also to be assumed that the sample bargaining unit will gain a vacation improvement of two additional shifts at the second step of longevity and an improved hospitalization program.

In the case of the improved hospitalization program, the employer's contribution is a fixed dollar amount. Therefore, it is not subject to any "roll-up" cost. This simplifies the calculations involved by only requiring the costing-out of the improvement in that benefit.

However, this is not the case with the vacations. Here the cost-increase is double-barreled. This means that both the cost of the improvement and the cost of the "roll-up" must be calculated out.

Since none of the other fringe benefits of the sample bargaining unit will be improved, we need to only compute the increases in cost due to the "roll-up." The fringes which fit this category, (because they are based on the basic salary), are overtime premiums, holidays, shift differentials, and pensions.

The "roll-up" impact of the salary increase on these fringe benefits is shown in Table 4–13.

Table 4–13
Cost Impact of the "Roll-up"

The added cost of the "roll-up" is obtained by multiplying the base, (pre-settlement), cost by the increase of 4.9 percent.

	(1) *Base Annual Cost Average*	*(2)* *"Roll-up" Factor*	*(3)* *Increased Cost (1) x (2)*
Overtime			
Straight time portion	$564.00	.049	$27.64
Premium portion	$282.00	.049	$13.82
Shift differential	$1,961.31	.049	$96.10
Holidays	$902.40	.049	$44.22
Pensions	$6,418.32	.049	$314.50
Total "Roll-Up" Cost			$496.28

Table 4–14
Increase in Cost of Vacations

(1) Number of Fire Fighters	(2) Hours of Increased Vacation	(3) Total Hours (1) x (2)	(4) Existing Hourly Rates*	(5) Cost of Improvement (3) x (4)
10 Privates	48	480	$11.332	$5,439.36
15 Lieutenants	48	720	$12.431	$8,950.32
5 Captains	*48*	*240*	*$13.530*	*$3,247.20*
Total				$17,636.88

* Derived from annual salaries (including longevity pay) divided by 2912 hours (56 hours X 52 weeks).

INCREASE IN COST OF VACATIONS

As noted earlier, the vacation improvement of 2 shifts, (48 hours), is to be limited to those whose length of service is equal to the time required to achieve the second step of longevity in the salary structure. Thus, it will be received by thirty members of the unit, ten privates, fifteen lieutenants, and five captains.

The first step in the computation is to determine the cost of the new benefit under the existing (old), salaries before the 4.9 percent pay increase. This is shown in Table 4–14.

This calculation reflects only the additional cost of the vacation improvement based on the salaries existing prior to the 4.9 percent pay raise. In other words, if there had been no pay increase, the vacation improvement would result in

Table 4–15
Increase caused by roll-up

(1) Classification	(2) Existing Vacation Costs*	(3) Increase in Cost**	(4) Adjusted Base Costs (2) + (3)	(5) Roll-up Factor	(6) Increased Cost From Roll-up (4) x (5)
Probationary					
Step 1	$5,975.40	———	$5,975.40	.049	$292.79
Step 2	$12,362.40	———	$12,362.40	.049	$605.76
Private					
Longevity-0	$92,307.60	———	$92,307.60	.049	$4,523.07
Longevity-I	$80,359.20	———	$80,359.20	.049	$3,937.60
Longevity-2	$40,795.20	$5,439.36	$46,234.56	.049	$2,265.49
Lieutenant	$67,127.40	$8,950.32	$76,077.72	.049	$3,727.81
Captain	$24,354.00	$3,247.20	$27,601.20	.049	$1,352.45
Totals	$323,281.20	$17,636.88	$340,918.08	.049	$16,704.97

By adding the cost of the improvement and the cost of the "roll-up," we obtain the total increase in the cost of vacations which is $17,636.88 + $16,704.97; or $34,341.85. In order to figure the average cost, this total must be divided by the number of fire fighters in the Sample Bargaining Unit.

The increase in the average cost of vacations is $34,341.85 ÷ 100; or $343.42.

* From Table 4-8.
** From above calculations in Table 4-14

an added cost of $17,636.88. However, there was a pay increase. As a result, the base year vacation costs, including the added cost of the improvement, must be "rolled-up" by the 4.9 percent factor.

Every hour of vacation, including the old and the new, will cost 4.9 percent more as a result of the pay increase. These computations are shown in Table 4–15.

It is important to note that while there is certainly a contractual cost associated with increased vacation time or other types of leave, there may or may not be a budgetary increase in cost. The increase in leave time will only show up as a budgetary cost if the employer actually pays for a replacement for the person on leave.

INCREASE IN COST OF HOSPITALIZATION

In this example, it has been assumed that the sample bargaining unit has negotiated, as part of its new package, an improvement in its hospitalization plan. As with most hospitalization programs, the one covering this unit is not linked to salaries.

It is assumed that this improvement will cost the employer an additional $24.00 per month or $288 per year for family coverage and $15.00 per month or $180 per year for single coverage. Thus, based on this and previous information about the breakdown of employees receiving each type of coverage, the calculation of the increase in hospitalization costs is a weighted average of the types of hospitalizations coverages offered. Table 4–16 shows these calculations.

Table 4–16
Increase in Cost of Hospitalization

(1)	*(2)*	*(3)*	*(4)*
Type of Coverage	*Covered Number*	*Annual Cost of Improvement*	*Total New Cost (2) x (3)*
Single	15	$180	$2,700.00
Family	85	$288	$24,480.00
Total			$27,180.00

The unit's average hospitalization cost per year will be increased by $27,180 ÷ 100; or $271.80 for each employee.

The Total Increase in The Average Cost of Compensation

At this point, the increase in the costs of all the items of compensation which will change because of the sample bargaining unit's newly-negotiated package have been calculated. All that is left is to combine these individual pieces in order to arrive at the total increase in the unit's average cost of compensation. This is done in the tabulation which appears in Table 4–17.

Table 4–17
Increase in Average Annual Cost of Compensation for Sample Bargaining Unit

The recapitulation below indicates the total increase in compensation — salary plus fringe benefits — for each fire fighter per year.

Straight-time Earnings		$1,650.14
Basic Salary	$1,622.50	
Longevity Pay	$0.00	
Overtime (straight-time portion)	$27.64	
Fringe Benefits		$1,083.86
Overtime Premium	$13.82	
Shift Differential	$96.10	
Vacations	$343.42	
Holidays	$44.22	
Hospitalization	$271.80	
Clothing Allowance	$0.00	
Pensions	$314.50	
Total Increase		$2,734.00

The final figure to calculate is the percentage increase that the negotiated settlement represents. In our example, the unit's average base compensation per year is $50,890.84 (from Table 4–12). The total increase for the annual cost of compensation is $2,734. Thus, the percent increase is 5.4%, ($2,734 ÷ $50,890.84), and is the amount by which the unit's package will increase the employer's average yearly cost per fire fighter.

Computing the Hourly Costs of Compensation

Computing the hourly cost of compensation is another important calculation. It allows you to determine the cost per hour of work of each separate benefit cost. The calculation is performed by dividing the total annual cost of each benefit by the total annual productive hours worked by the employees. Cost per hour of work is used because all benefits are paid for in return for a specific number of productive hours worked by the employees. This is usually precisely stipulated by the employer.

Even though computing the hourly cost of compensation will produce the same percent increase as the average annual cost of compensation, the approach to the calculation is dif-

ferent and yields different information than the approach used in connection with the cost per year. Furthermore, the cost per hour of work is important whenever any negotiated settlement calls for a change in the non-productive paid hours, such as vacations, holidays, and other paid absence time.

The first step in calculating the cost per hour of work is to determine the total productive hours worked per fire fighter in the unit. This will be the basis upon which all benefit cost will be measured.

The total productive hours worked is calculated by adding together the total hours paid for and subtracting out all the paid hours not worked.

Table 4–18 shows this calculation for our sample bargaining unit.

Paid leave hours are usually considered bonuses because they are hours paid for above and beyond hours worked. They usually consist of paid vacations and paid holidays.

In order to obtain the hourly cost of this type of paid leave, the annual dollar cost of these benefits is divided by the annual productive hours worked. It is the same as if you were trying to compute the per-hour cost of a year-end bonus. The dollar amount of that bonus would simply be divided by the total number of hours worked during the year.

This is the case with all fringe benefits, and not just with paid leave. In exchange for a benefit, the employer receives hours of work in straight-time hours and/or overtime hours.

Consequently, the hourly cost of any fringe benefit can be obtained by dividing the annual cost of the benefit by the annual number of hours worked. In some instances that cost is converted into money that ends in the employee's pocket. This would be the case with fringe benefits such as shift differentials, overtime premiums, and clothing allowances. In other instances, such as hospitalization and pensions, the employee is provided with benefits in the form of insurance programs. And in the case of paid leave time, such as holidays and vacations, the return to the employee is in terms of fewer hours of work.

Table 4–18
Productive Hours Worked

	Regular scheduled hours	2,912*
+	overtime hours	+ 50**
-	holiday hours	- 80***
-	vacation hours	- 282****
	total productive hours	2,600

* 56 hours per week x 52 weeks.
** Average of 50 hours of overtime per year.
*** 10 paid holidays at 8 hours of pay per holiday.
**** 15 fire fighters x 120 hours.
(five 24 hr. shifts) = 1,800 hrs.
35 fire fighters x 240 hours.
(ten 24 hr. shifts) = 8,400 hrs
50 fire fighters x 360 hours.
(fifteen 24 hr. shifts) = 18,000 hrs
Total = 28,200 hrs.

The average hours of vacation per fire fighter = 28,200 ÷ 100; or 282 hrs.

The average annual costs of the fringe benefits of the sample bargaining unit were developed earlier in this chapter in connection with the computations of the unit's average annual base compensation. In order to convert the costs of those fringe benefits into an average hourly amount, they are divided by 2,600, (the average productive hours worked during the year by each employee in the unit). Table 4–19 shows these computations.

Table 4–19
Hourly Cost of Fringe Benefits

(1) Fringe Benefits	(2) Average Annual Cost**	(3) Average Hours Worked	(4) Average Hourly Cost (2) ÷ (3)
Overtime Premium*	$282.00	2,600	$0.108
Shift Differential	$1,961.31	2,600	$0.754
Vacations	$3,232.81	2,600	$1.243
Holidays	$902.40	2,600	$0.347
Hospitalization	$4,530.00	2,600	$1.742
Clothing Allowance	$150.00	2,600	$0.058
Pensions	$6,418.32	2,600	$2.469
Totals	$17,476.84	2,600	$6.721

The hourly cost of all fringe benefits is $17,476.84 ÷ 2,600: or $6.72.
* Includes only the premium portion of the pay for overtime work.
** From Table 4–12.

Note that, in addition to the fringe benefit costs, compensation includes the basic pay. For our sample bargaining unit, this is $32,850.00 per year, (average salary plus average cost of longevity payments). On a straight-time hourly basis, this comes to $11.28, ($32,850 ÷ 2,912 hours). With the straight-time portion of the year's overtime of $564.00 included, the average straight-time hourly rate of pay is still $11.28, ($33,414 ÷ 2,962 hours).

Recapitulation of the salary and fringe benefit cost data produces both the average annual base compensation figure and the average hourly figure. This can be seen for the sample bargaining unit in Table 4–20.

Table 4–20
Current Average Annual Base Compensation and Average Hourly Rate

Yearly		Hourly
$33,414.00	Earning at Straight-Time divided by 2,962 hours.=	$11.28
$17,476.84	Fringe Benefits divided by 2,600 hours.=	$6.72
$50,890.84	Total Current Compensation	$18.00

When calculating the percentage increase in compensation on an hourly basis, essentially the same process is followed as if you were to compute the annual percentage increase. Table 4–21 shows how this would be done for the sample bargaining unit.

Table 4–21
Increase in Compensation on an Hourly Basis

The five percent pay increase requested by the sample bargaining unit would be worth 55.7 cents per hour (Current average wage of $32,450 x .05 ÷ 2,912 hours).

The annual increase in the unit's fringe benefit costs per fire fighter is 41.7 cents per hour, (Fringe benefit increase of $1,083.86 from Table 4-17 ÷ 2,600 hours).

The total gain in average compensation is 97.4 cents, (55.7 cents + 41.7 cents).

The percentage increase is $.974 ÷ $18.00; or 5.4 percent.

Note that this percentage increase is the same amount of increase reflected by the annual data.

Problems Computing The Cost Of Compensation

In order to calculate compensation costs, it is necessary to include both the cost of salary and fringe benefits. However, it should be understood that the calculation of fringe benefits may not be simple.

For example, the union may find it difficult to calculate the benefits provided by sick leave. If employees are allotted fifteen days of sick leave per year but on the average, only use ten of those sick days, what is the cost of the benefits provided? Is it the cost of fifteen days of work or only ten days? Problems become even more complicated when the union tries to take into account the value of accumulated sick leave. If an individual, after 20 years of working, accumulates 150 days of sick leave worth 50 percent of wages upon retirement, what is the cost of the benefits provided? The individual might wait till retirement to receive his benefits or could become injured and use all the sick leave days while still fully employed.

In these types of instances, where it is difficult to accurately cost out the cost of fringe benefits, it will be difficult for the union to accurately measure the result of a proposed increase in compensation.

Another problem arises when complete information in the cost of the fringe benefits is not available because the

salary data is representative of the cost of the fringe benefits. However, this problem can be remedied.

For example, assume that there is a unit that receives an average salary of $30,000 per year and fringe benefits worth an additional $5,000. Total compensation per employee would be $35,000 per year.

Also, assume that $1000 of the fringe benefits is flat-dollar payments for the uniform allowance and medical insurance. The remaining $4,000 is for vacations, holidays, sick leave, overtime, and pension plan contributions.

If a raise of $1000 in salary is negotiated, the change in compensation costs would be as follows.

a. The cost of salary increases by $1,000. This would be a 3.3 percent increase, ($1,000 ÷ $30,000 x 100).

b. The cost of fringes will also increase 3.3 percent because of the "roll-up". Therefore, the increase in fringes is $132, ($4,000 x .033).

c. The cost of compensation will rise $1,132, ($1,000 + $132). This represents a gain of 3.2 percent, ($1,132 ÷ $35,000 x 100), as contrasted to the 3.3 percent gain in salary.

The percentage increase in compensation cost is less than the percentage increase in the cost of the salary because some of the fringe benefits are not salary related and are not subject to the "roll-up."

If there had been any improvement in the fringe benefits, then the cost of compensation would have risen by more than 3.2 percent.

For example, assume that in addition to the $1000 increase in salary, the unit also received one additional paid holiday. If the unit works the equivalent of a 40-hour work week, that holiday would be worth $134.62 per fire fighter per year, ($35,000 ÷ 2080 hours x 8 hours).

We would then have the same increase in salary of 3.3 percent, but a different increase in the cost of fringe benefits. This increase would be $271.06, which is the cost of the holiday, $134.62, plus the effect of roll-up on that portion of the benefit package subject to it (($4,000 + $134.62) x .033 = $136.44).

Therefore, the annual cost of compensation per fire fighter would rise by $1,271.06, ($1,000 salary + $271.06 roll-up). This would represent an increase in the cost of compensation of 3.6 percent, ($1,271.06 ÷ $35,000 x 100).

If other benefits had also been improved, the cost of the gain in compensation would have been more than 3.6 percent.

It should be noted that it is rare for any group to receive major improvements in fringe benefits year-after-year. More often than not, there may be a gain in fringes one year, followed by two or more years, in which no substantial changes are made.

This means that the rate of gain in salaries represents an accurate measure of the rate of gain in total compensation. Therefore, fire fighters should be able to gauge their rate of gain in compensation by reference to their rate of gain in salaries. This may be essential on some occasions, especially when the union does not have complete and ready access to the cost data relating to fringe benefits. In these circumstances, the salary data, can serve as a stand-in. However, this arrangement would be unsuitable during those periods when employees may have been receiving substantial improvements in fringe benefits.

Finally, sometimes the increases in costs of fringe benefits may be misleading. For example, in the case of pensions, the employer's costs may simply rise because they decide to increase their contribution to the pension fund in certain years. This does not represent a true increase in fringe benefit value.

Chapter V:

Measuring Productivity in the Fire Service

Productivity in the fire service, as in any industry, is ultimately output divided by input. Management will often speak of the need to increase fire service or fire fighter productivity, and in support of its position may use such statistics as fires per fire fighter, runs per paramedic, inspections per fire inspector, calls dispatched per dispatcher, etc. While these types of data may measure work load, they do not necessarily measure fire service efficiency or fire fighter productivity.

The following example will attempt to explain this subject:

1. Assume that a factory produced 200,000 chairs in 1995 and 250,000 chairs in 1996. Therefore, from one period to the next, output increased by 50,000 chairs or 25%. However, the fact that output increased indicates nothing about the efficiency by which the increase in output was achieved.
2. Now assume that the factory had 20 employees in 1995 and 25 in 1996, and that each employee worked 2,080 hours in both years. For the plant as a whole, total hours of work equaled 41,600 hours in 1995, (2,080 hours x 20 employees), and 52,000 hours in 1996, (2,080 hours x 25 employees). Thus, in 1996, the company not only raised the number of chairs, or output, by 25% but also increased the total number hours of work, or input, by 25%. Therefore, productivity, which equaled 4.8 chairs produced per hour worked in 1996, (250,000 chairs ÷ 52,000 hours),was the same as the output per man hour worked in the previous year.

In this example, productivity in 1996 would have increased relative to 1995 had one of the following occurred: (a) output had remained stable while hours of work decreased, (b) output increased with no corresponding change in hours worked, or (c) output increased at a rate faster than the increase in hours worked.

Problems Measuring Productivity in the Fire Service

Because the inherent nature of the fire service is protecting and saving lives and property, no adequate measure of productivity has been developed. Fire in itself is negative which makes it difficult to translate fire protection into inputs and outputs.

Measuring Input In The Fire Service

The inputs involved in the fire service are multifaceted. As in any industry, those inputs include labor, capital, education, etc. In short, the inputs used in the fire service are represented, not by a single type of input, but by a mix of different kinds.

For example, assume that there is a unit of urban fire fighters that are proven to be the most effective and efficient in fire protection. Now assume that this unit is moved from the city to the rural countryside. The fire fighting capability of a unit so transplanted may be severely affected given potential lack of water supply in the rural setting and the need for training in tactics substantially different from those encountered in the city. Therefore, in this case, no matter how inherently efficient the labor input was, the lack of capital and training inputs would severely effect overall efficiency.

Major increases or decreases in productivity do not rest solely on the shoulders of labor. Management also bears substantial responsibility for ensuring that the amount and the mix of inputs are adequate to do the job.

Measuring Output In The Fire Service

While it may be difficult to measure the input side of the productivity equation, the definition of output or production is even more troublesome. It should be clear that fire is not output. Therefore, increases in fires per fire

fighter do not measure productivity. Fire is negative and productivity can not be defined by a negative output. The mission of the fire service is protection of life and property. Thus, it is impossible to adequately quantify the activities that go into the production of fire protection.

For example, assume there are two comparable fire units, (the staffing of each of the companies is the same, the locations worked in are similar, the population protected is the same, etc.). Now assume that in one year, one fire company answered 1,000 alarms while the other company answered no alarms. Which company was more productive? This question is impossible to answer because one can not measure the output of either company. There is no way to place a value on lives lost, let alone those that are saved, or to determine the number of deaths prevented by fires that did not occur because of an inspection program, etc.

Moreover, the "mix" of fires that occur changes drastically from one year to the next. Indeed, two fires are never alike. With the passage of time, fire departments are confronted with proportionately more activity in high-rise buildings and with increasingly hazardous and difficult materials. In addition, many factors influencing the delivery of fire protection or emergency medical services are beyond both management's and labor's ability to control. For example, the age of structures, the density of population, and other socioeconomic conditions can have positive or negative effects on fire service productivity.

Since there is no single unit of overall fire service output, management has attempted to develop productivity indicators, based upon such items as number of alarms answered, number of fires fought, number of inspections completed, value of property protected, amount of fire loss, etc. However, increases or decreases in these partial measures are often erroneously used to gauge the direction of total fire service efficiency.

Staffing and Workload

In order to offset increased costs, city managements have, quite naturally, focused on the issue of productivity. Where the fire service is concerned, they tend to seek increases in productivity through modifications that reduce manpower. These modifications may include (a) fewer fire fighters on each piece of equipment, which means fewer fire fighters on each response; (b) fewer pieces of equipment responding to each fire, which likewise means fewer fire fighters on each response; or perhaps (c) a shutdown of stations. In the latter situation, the response level, although not the response time, can be maintained, but it means that each fire fighter is responding to more calls than he did before the curtailment of stations.

While these changes produced an increase in fire fighter workload, there is no way to support that they increase productivity. Instead, from the standpoint of the public, output, in the form of services, is not increased but is actually decreased. As such, there may be a decrease in budgetary expenditure. It is really this reduction in government outlays that management has misinterpreted as being productivity.

Increased productivity cannot be achieved by simply increasing the level of effort of each fire fighter and in fact, this increased work load may be counter productive to real fire service productivity growth. Fire service productivity growth should be defined as an increase in the level of protection and delivery of service provided to the public without a corresponding increase in the level put forth by the fire fighters.

Chapter VI:
Financial Analysis

In order to negotiate a contract, the union must know the basic financial condition of its municipality. It needs to know what monies are available to fund fire fighter wage and benefit increases so that appropriate demands can be made in negotiations.

To determine the basic financial condition of the city, it is necessary to understand the concepts that underlie a particular municipality's budget and financial statements. In this section, the financial documents published by local governments will be described and analyzed.

When negotiations approach, you should obtain the documents discussed here for your own municipality and analyze them in a manner similar to that described in this chapter. This will allow you to base proposals on facts about the municipality's resources.

If the city claims it is unable to pay, the union must make sure that the argument is based on a lack of fiscal capacity rather than mere reluctance to meet union demands. The union can determine the validity of these arguments through analysis of the city's financial statements. The most pertinent financial documents are the budget, the monthly revenue and expense statements, and the audited annual financial statement (audit report). These documents should be obtained at least four months in advance of the contract negotiation date in order to allow ample time for analysis.

Another useful document is the city's bond prospectus. The city will typically paint a very favorable picture of its financial position to potential investors. This can be of obvious value if the city later claims inability to pay the union.

There are three questions which must be answered when trying to refute the city's claim that it is unable to pay union demands. They are:

1. Does the city have the authority to reprioritize expenditures within the current level of spending?
2. Does the city have the fiscal and legal capacity to raise additional revenue?
3. Does the city currently have the funds available to finance the union's demands?

First, can the city reprioritize expenditures? The budget is a financial plan which establishes spending priorities and goals. The spending priorities of the city and the way funds are allocated is a constantly debated issue with groups and organizations pressing government officials to shift city resources to suit their perceived needs. For example, the chamber of commerce may lobby to redirect resources away from the city's vital services, such as police and fire, in order to subsidize a new convention center. The union, however, may voice its opposition to this shift in priorities by arguing that the vital services are not sufficiently funded. Thus, to ensure that the needs of the members are met, the union must be an active participant in the budgetary process.

Second, can the city legally raise additional revenue? Cities can raise additional revenue in several ways. While it may not be politically popular, one measure of ability to pay is the legal authority of the city to increase taxes. Others may include increasing licensing, permit, or users fees.

Third, does the city have unencumbered funds to cover any increases in wages and fringe benefits? If a city has large amounts of unrestricted funds, it cannot easily justify the claim of inability to pay. It is through the examination of the city's financial statement, and not the budget, that the union will be able to determine the existence and size of any unencumbered funds and the extent to which these funds can be used to cover the increased cost of the union's demands.

The Budget

Municipalities are required by law to develop an annual budget. The budget is implemented for a specified 12-month period, known as a fiscal year. This 12-month period can be the calendar year or any other 12-month period, such as July 1 to June 30.

The budget is a series of estimates of the amount of money which the city expects to receive from taxes and other sources and how that expected revenue is to be allocated among the various competing demands of the jurisdiction.

The budget is developed by the executive branch of the municipality several months prior to the beginning of the fiscal year. As such, it is only a best guess of some future reality. It should be clear that there is no way that management can know the exact amounts of total revenue and total expenditures several months prior to the beginning of that fiscal year.

Because of this uncertainty, budgets tend to be very conservative. Budget makers almost always overestimate expenditures and underestimate revenues. Therefore, the balance between revenue and expenditures is likely to be tighter in the budget than it turns out to be in reality. The budget, therefore, should not be viewed as a precise measure of the financial condition and resources of the municipality, but instead as a planning document which establishes the spending priorities and goals of the local government.

After it is adopted by the appropriate governmental entity, the budget, during the course of the fiscal year, also becomes a standard against which actual performance is measured. It is not so binding, however, as to preclude spending for any purpose other than those originally identified.

The following examples illustrate that budgets are merely planning documents by contrasting the estimates adopted by the city council at the beginning of the fiscal year with the actual revenues and expenditures for the fiscal year.

Table 6–1 is a statement of revenue while Table 6–2 is a statement of expenditures. In both the approved budget fig-

Table 6–1
General Fund Revenue – Budgeted and Actual For Fiscal Year 1996

	Budget	*1996 Actual*	*Variance*
General Property Taxes	$132,847,000	$132,965,000	$118,000
Other Local Taxes	$63,410,000	$66,003,000	$2,593,000
Charges for Services	$11,357,000	$12,950,000	$1,593,000
Licenses and Permits	$31,574,000	$31,317,000	($257,000)
Fines and Forfeitures	$7,673,000	$9,470,000	$1,797,000
Revenue from Use of Money and Prop.	$7,284,000	$9,198,000	$1,914,000
Intergovernmental	$1,252,000	$1,190,000	($62,000)
Other	$1,062,000	$907,000	($155,000)
Total revenues	$256,459,000	$264,000,000	$7,541,000

Table 6–2
General Fund Expenditures – Budgeted Versus Actual For Fiscal Year 1996

	Budget	*1996 Actual*	*Variance*
General government	$12,049,000	$11,640,000	$409,000
Public Safety	$120,335,000	$119,696,000	$639,000
Transportation and Public Works	$23,329,000	$23,329,000	$0
Parks and Community Services	$16,974,000	$16,974,000	$0
Public Library	$7,935,000	$7,750,000	$185,000
Public Health	$5,625,000	$5,603,000	$22,000
Public Events and Facilities	$9,480,000	$9,416,000	$64,000
Nondepartmental	$14,948,000	$14,122,000	$826,000
Planning and Development	$3,703,000	$3,702,000	$1,000
Fiscal Services	$4,044,000	$4,044,000	$0
Housing	$343,000	$302,000	$41,000
Total Expenditures	$218,765,000	$216,578,000	$2,187,000

Table 6–3
Excess of Revenues Over Expenditure
For Fiscal Year 1996

	Budget	*Actual*	*Variance*
Total Revenue (Figure 1)	$256,459,000	$264,000,000	$7,541,000
Total Expenditure (Figure 2)	$218,765,000	$216,578,000	$2,187,000
Surplus	$37,694,000	$47,422,000	$9,728,000

ures are located in the column labeled "Budget." Next to this is a column labeled "Actual" which contains the actual revenue or actual expenditures depending on which statement is viewed. The final column, labeled "Variance," is the difference between the amounts budgeted at the beginning of the fiscal year and the actual figure for that year.

The parentheses around some of the numbers indicate figures which are unfavorable to the city. In the revenue statement, they indicate the city did not receive as much revenue as expected in the budget. In the expenditure statement they indicate the city spent more than expected in the budget.

As shown in Tables 6–1 and 6–2, the city's financial plan, manifested in the budget and developed several months prior to the beginning of the fiscal year, proved to be substantially off the mark when compared to the city's actual fiscal performance. While the city originally budgeted $256,459,000 in total revenue, it actually received $264,000,000, an understatement of over $7.5 million or 2.9 percent.

On the other hand, actual expenditures of $216,578,000 proved to be over $2.1 million or 1 percent less than the $218,765,000 originally budgeted.

As shown in Table 6–3, what was originally estimated as a budget surplus of nearly $37.7 million turned out to be a surplus of well over $47.4 million. Consequently, there was close to a $10 million difference from the point that the budget was originally developed prior to the beginning of the fiscal year and the point at which the city closed its books at the end of the fiscal year.

The Financial Statements

Financial statements describe the city's actual revenue and expenditures during the fiscal year. These financial statements are audited, which means that an outside group examines the records for their accuracy and issues a report on the financial condition of the municipality. These audited financial reports, in contrast to the budget, show the actual data for the fiscal year already completed. Therefore, the financial report is a record of past performance while the budget is a plan for the future.

An important point to note is that all financial statements have footnotes that describe entries which are unusual or require a further detailed explanation. For example, if a city suddenly receives $45 million in revenue instead of the usual $25 million, there was probably a significant event that caused the change. This abrupt change will be noted with an explanation. Many important points are thus found in the notes to the financial statement, and it is important to examine each of these carefully.

For accounting purposes, the city's finances may be segregated into several different funds. The largest fund in the city, which is used to account for the expenditures of day-to-day operations is called the General Fund. The city may have other funds, such as the Special Revenue, Debt Service, Capital Projects, Enterprise, and Trust and Agency. These latter fund types are usually required by statute or ordinance to account for monies that are designated for special use and therefore maybe restricted. Each of these funds will have its own set of revenue and expense statements, (as shown previously in Tables 6–1, 6–2 and 6–3), and what is known as a Balance Sheet.

Balance Sheets show the assets, liabilities, and the fund balance of a municipality at a particular point in time. While the revenue and expense statements indicate what has taken place during the previous 12-months, the Balance Sheet is a snapshot of the city's fiscal position at a single point in time. Usually, that point in time is the last day of the fiscal year. For example, a city could of had a surplus during the current fiscal year as shown in the revenue and expense statement, however, examination of the Balance Sheet may reveal a negative fund balance because of accumulated deficits for previous fiscal years. To help explain the balance sheet, a sample Balance Sheet for a general fund of a city is located in Table 6–4.

The first section of the balance sheet is assets. Assets are what the city owns, such as cash, investments, and money owed to the city but not yet collected. The second section of a Balance Sheet is liabilities. Items accounted for here are monies that the city owe which may include

Table 6–4
Balance Sheet - General Fund

	1995	*1996*
Assets		
Cash and Cash Equivalents	$ 53,526,000	$ $45,732,000
Receivables:		
Taxes	18,405,000	18,419,000
Grants and Other Governments	11,191,000	11,232,000
Accounts and Other	13,477,000	9,319,000
Allowance for Doubtful Accounts	(22,824,000)	(23,430,000)
Due From Other Funds	12,119,000	10,824,000
Inventories (at cost)	1,518,000	2,003,000
Deposits and Other	579,000	611,000
Restricted Assets:		
Cash and Cash Equivalents	$ 600,000	$ 803,000
TOTAL ASSETS	$ 88,591,000	$ 75,513,000
Liabilities and Fund Balance		
Accounts and Contracts Payable	$ 5,785,000	$ 6,120,000
Estimated Claims Payable	2,320,000	1,105,000
Accrued Compensation	5,652,000	7,046,000
Due To Other Funds	74,000	0
Other	7,040,000	999,000
Deferred Revenue	3,030,000	2,485,000
TOTAL LIABILITIES	$ 23,901,000	$ 17,755,000
Fund balance		
Reserved for encumbrances	$ 2,024,000	$ 186,000
Reserved for inventories	1,518,000	2,003,000
Unreserved:		
Designated for authorized expenditures	1,069,000	1,458,000
Designated for insurance expenditures	18,767,000	24,190,000
Undesignated	41,312,000	29,921,000
TOTAL FUND BALANCE	$ 64,690,000	$ 57,758,000
TOTAL LIABILITIES AND FUND BALANCE	$ 88,591,000	$ 75,513,000

accounts payable, money due other governments, or deferred revenue.

The final and perhaps most important figure contained in the Balance Sheet is the Fund Balance. This item may be known by other terms such as accumulated fund balance, surplus, or reserves. It is the amount by which assets exceed liabilities.

Some balance sheets will segregate the money into reserved and unreserved categories. Those balances that have been reserved are either set aside for past encumbrances or appropriated for subsequent years' expenditures. Unreserved fund balances, on the hand, have not been set aside or appropriated for any particular use.

As Table 6–4 shows, the fund balance decreased from $64,690,000 in 1995 to $57,758,000 in 1996. This decrease is due to transfers out of the general fund. Thus, it is apparent that there is a relationship between the balance sheet and the statement of revenue and expenditures. That is, the change in the fund balance from one year to the next is the same as the difference between the revenues and expenditures for the fiscal year, excluding transfers.

Problems of Comparability of City Financial Data

Financial comparisons between cities are exceedingly risky for a negotiating local. One major reason is that not all cities keep their financial records in the same way. The other major problem is that from one state to the next, and even within the same state, there is wide variation in the way in which responsibilities for providing services are divided between state government, local government, school districts, or other taxing entities.

Thus, an item that appears in the budget of City A may not appear in the budget of City B because in City B that item is the responsibility of some other level of government. This means that the budget data from different cities may be non-comparable, and attempts to produce inter-city comparisons based on such data will be full of errors.

Nevertheless, such comparisons are frequently made, and they are used by management in negotiations with local unions. Typically, those comparisons are designed to establish that the expenditures for the fire service of the negotiating city are proportionately greater than for other cities.

This is usually accomplished by comparing the percentages; that is, looking at fire service expenditures as a percent of total municipal expenditures for any given year or years. City A, for instance, may spend $10 million on its fire service, out of the city's total expenditures of $100 million for the year. Thus, the fire service accounts for 10 percent of the city's outlays ($10 million ÷ $100 million = .10 = 10 percent).

City B, on the other hand, may have an outlay of $14 million for the fire department, out of total city expenditures of $200 million. This comes to 7 percent, and suggests that City A is spending proportionately more in order to provide fire protection.

That may, in fact, be the case. Some cities may indeed spend proportionately more on fire protection than do other cities. This may be due simply to the payment of higher salaries for fire protection personnel. But it may also be due to the fact that the fire problem is more severe in some cities than in others. Some cities, therefore, may require proportionately more staffing. Also, the fire departments in some cities need additional personnel because they have responsibilities not assigned to fire departments in other cities.

Another possible explanation of the differences found in inter-city comparisons is that the data are really not comparable. Consider, for example, the case of two cities of comparable size in Michigan in 1992—Saginaw, which had a population of 70,719, and Royal Oak, which had a population of 67,298.

In fiscal year 1992, Saginaw spent $6,708,000 on fire protection, while the city's total expenditures amounted to $72,299,000. Spending for the fire service, therefore, represented 9.3 percent ($6,708,000 ÷ $72,299,000 = .093 = 9.3%) of the total expenditures.

The corresponding figures for Royal Oak in fiscal year 1992 were $3,147,000 out of a total of $56,839,000 so that the fire service represented only 5.5 percent ($3,147,000 ÷ $56,839,000 = .055 = 5.5%) of the total expenditures. Seemingly, the fire service represents a proportionately heavier burden in Saginaw than in Royal Oak.

However, another set of data discloses that, in terms of employment, the fire service appears to have the same burden in both cities. The U.S. Bureau of the Census publishes employment figures for individual cities according to function, such as police protection, fire protection, sanitation, etc. Moreover, it also publishes, for those cities, total employment in what it terms "common municipal functions." This excludes employment in activities that are not in all cases the responsibility of government at the municipal level, such as education, health, or public housing, or that may exist in some cities but not in others, such as municipally-owned public utilities, transit systems, or airports.

As the term implies, "common municipal functions" are those activities for which responsibility rests uniformly with government at the city level. Thus, these employment figures are much less cluttered than are the expenditure figures with "extraneous" items that may be covered by one city's budget but not by another's. These figures, for our example, call into question the validity of the Saginaw/Royal Oak financial data cited previously.

Saginaw, for example, had 105 employees in fire protection in 1992 out of a total employment of 744 for all "common municipal functions" according the Bureau of Census. This represents 14.1 percent of the city's total employment for "common municipal functions."

For Royal Oak, the same Census report showed that fire service employment was 71, out of the city's total of 542 for all "common municipal functions." Thus, employment in the fire service represented 13.1 percent of the total. This is very close to the proportion that existed in Saginaw.

Nevertheless, the financial data, it will be recalled, suggested that the fire service represented a much larger portion of the city's expenditures in Saginaw than in Royal Oak. Conceivably, this could have been the case if the fire service pay scales in Saginaw in 1992 had been substantially higher than in Royal Oak.

However, this was not the case. In fact, the reverse was true. In 1992, the fire fighter's average salary was $34,000 in Royal Oak, and $33,500 in Saginaw. Without a considerable amount of study, there is just no way to reconcile these salary figures and the employment data with the results produced by the expenditure statistics for the two cities. The problem probably lies in the expenditure statistics since, from one city to the next, they do not necessarily measure the same things. Therefore, as was indicated earlier, inter-city comparisons based on such financial data require careful review and evaluation, for they can be misleading.

Appendix A: Information Sources

The first step in the process of using economic data is finding the best sources of information and data. The sources you are likely to use the most are the IAFF, your employer, and those government agencies dealing with industrial and labor relations.

Before discussing how to obtain data, it is important to emphasize the necessity of clearly and completely documenting your sources. The employer almost certainly has the right to question or challenge data on which an argument is based, and if the source cannot be supplied, the entire argument may become suspect.

Related to this is the importance of using *official* economic and demographic data unless there is some very good reason not to do so. The official source will usually be part of a government agency, such as the Bureau of Labor Statistics or the Bureau of the Census. For example, population figures which come from the United States Bureau of the Census are the official ones, and are difficult to dispute as long as they are current. Population figures obtained by a phone call to a person whose name you cannot recall at a local chamber of commerce might very possibly be questioned.

Obtaining data from the IAFF

You can obtain much of the information you will need from the IAFF. While the International cannot supply Census and BLS publications, many of their most commonly used publications are on file there, and the IAFF can often give you most or all of the information you need from them.

The IAFF maintains substantial data on member locals. An overview of what is available follows:

- An automated key agreement file and a non-key agreement file.
- Economic data for locals including wages, longevity, shift differentials, uniform allowances, scheduled hours of work, and leave.
- A clause tracking system which includes seventy five clauses and their frequency.
- A death and injury database.
- A demographic database.

Obtaining Data From the Employer

THE EMPLOYER'S OBLIGATION TO PROVIDE DATA

Current labor law has sufficiently established an obligation by the employer to provide all the information requested by a union that is relevant to the collective bargaining relationship. This obligation typically includes information pertaining to wages, hours, and other conditions of employment. This information is necessary to prepare for contract negotiations, to properly administer an existing collective bargaining agreement, and to evaluate grievances as well as to prepare for grievance meetings.

The initial data request should explain exactly what is needed since vague requests may encourage similarly vague responses by the employer. Furthermore, the union should not only ask for what information it wants, but the union should also ask for the particular way it would like the data presented.

The employer is not obligated to and normally will not provide any information not specifically requested by the union. Therefore, the union must be sure to request all of the relevant information needed. Even though the union always has the right to request additional information during the collective bargaining process, requesting all of the necessary data at least four months prior to contract termination gives adequate time to receive the data and properly prepare the data for effective and comprehensive use during collective bargaining with the employer.

The union will typically not be forced to prove the relevance of any data request that is related to wages, hours, and working conditions. However, there are some restraints

put on a union when trying to obtain pertinent information from the employer. The union must provide reasonable time for the employer to respond to the request of information. This is usually at least four months prior to contract termination. If not enough time is given for a request, the employer can refuse to provide the data on the basis that the data request is too extensive for the time period given. Although modern technology makes it increasingly difficult for an employer to use this argument, it is still good practice to submit your request early enough to allow yourself time for thorough analysis.

It should also be noted that the employer is not required to provide information about benefits provided to management and to other employees outside the bargaining unit, unless the cost of benefits provided to bargaining unit workers is tied to the cost of benefits provided to the non-bargaining unit workers.

For public employees, such as the members of the IAFF, financial information can usually be obtained from government budget reports available to the public. For private employees, financial information can be obtained from annual stockholder reports, investor news services, and government filings.

SUBMITTING THE FORMAL DATA REQUEST

An effective, formal, pre-collective bargaining data request should be written in a format that will avoid misunderstanding between the two sides. The request should include a date by which the union expects the employer to respond and statements explaining exactly what data is requested and how the data should be presented. By doing this, the union and the employer will reach an understanding of the issues to be dealt with in the collective bargaining process.

Also, as stated before, the union should make a formal pre-collective bargaining data request at least four months prior to contract expiration to allow adequate time for both employer response and union analysis.

The next page gives a sample data request outline.

Sample Data Request Form for the Employer

The following is a model data request form and cover letter showing the kinds of information that should be requested. This model should be used only as a guide; obviously, adjustments will be made to fit each individual situation.

A. COVER LETTER

As the representative of employees in Local #____ of the International Association of Fire Fighters, we have enclosed a request for information that is needed to properly prepare for the upcoming negotiations. We would like the information presented to us on a timely basis, preferably no later than _____.

B. INFORMATION REQUEST FORM

The following is the minimum information that should be requested:

1. Listing of the job classifications and the number of individuals within each classification.
2. Salary which applies to each job classification.
3. Listing of longevity steps, the number of individuals at each step, and the amount awarded for each longevity step.
4. Number of regularly scheduled hours of work in both a standard week and a standard year.
5. Average amount of overtime worked for the last full budget year.
6. Amount awarded as a shift differential.
7. Amount of vacation allocated to each classification.
8. Listing of entitled holidays and the wage rate and hours awarded.
9. Wage rate for work on holidays.
10. Total miscellaneous absence hours paid per year (e.g., general leaves, union leave, jury duty). Provide details on each type of absence if they are available.
11. Amount of clothing allowance allocated to each employee.
12. Total sick and injury absence hours paid per year.
13. Types of insurance provided, with rates of contribution for both employers and employees.
14. Listing of the number of workers selecting single and family coverage if available under each type of insurance available to the bargaining unit in each of the last three years.
15. Listing of the average per-person monthly premiums for single and family coverage under each type of insurance available.
16. Amount of employer/employee contributions to pension fund, including dollar contribution per employee and/or percentage of payroll paid.
17. Provide information on total annual costs of any other negotiated benefits and specify which of these benefits are adjusted with wages.

Obtaining Federal Government Data

As mentioned earlier, the federal government is the official source of much of the data you will need. The most frequently used sources are the Bureau of Labor Statistics and the Bureau of the Census. Much of the information is free, but a fee is charged for many useful publications. Prices and publication schedules are subject to change, so it is best to contact the departments directly.

Before spending considerable time (and possibly money) in pursuit of government information, remember that you can probably get much of what you are looking for relatively quickly and easily.

Your local library can be an excellent free and convenient source of government publications. In particular, college and university libraries, county libraries, and larger branches of city libraries often carry current government publications and catalogs of what is available.

The IAFF can also supply you with much of the Census and BLS information you will need and can provide guidance on what is available and how to obtain it.

BUREAU OF LABOR STATISTICS

The Bureau of Labor Statistics (BLS) is a division of the United States Department of Labor. BLS publishes a wealth of information, much of it free on request, which can be useful in negotiations.

The main office of the BLS is located in Washington, D.C. However, the BLS also maintains regional offices around the country. Specific inquiries can be directed to any of these offices.

Main Office
U.S Department of Labor
Bureau of Labor Statistics
441 G Street , NW
Washington, DC 20212

Region I (CT, MA, ME, NH, RI, VT)
John F. Kennedy Federal Building
Room E-310
Boston, MA 02203
Automated Information - (617) 565-2327
Faxstat - (617) 565-9167
Fax - (617) 565-4182

Region II (NJ, NY, PR, VI)
201 Varick Street, Room 808
New York, NY 10014
Automated Information - (212) 337-2400
Faxstat - (212) 337-2412
Fax - (212) 337-2532

Region III (DC, DE, MD, PA, VA, WV)
3535 Market Street
P.O. Box 13309
Philadelphia, PA 19101
Automated Information - (215) 596-1154
Faxstat - (215) 596-4160
Fax - (215) 596- 4160

Region IV (KY, TN, NC, SC, AL, GA, MS, FL)
Bureau of Labor Statistics
61 Forsyth St., S.W.
Atlanta, GA 30303
Automated Information - (404) 562-2463
Faxstat - (404) 562-2545
Fax - (404) 562-2550

Region V (IL, IN, MI, MN, OH, WI)
Federal Office Building
230 S. Dearborn Street, 9th Floor
Chicago, IL 60604
Automated Information - (312) 353-1880
Faxstat - (312) 987-9288
Fax - (312) 353-1886

Region VI (AR, LA, OK, TX, NM)
9th Floor
Federal Building
525 Griffin Street Rm. 221
Dallas, TX 75202
(214) 767-6970
Faxstat - (214) 767-9613

Regions VII & VIII (VII – IA, KS, MO, NE; VIII – CO, MN, ND, SD, UT, WY)
Kansas City, MO 64106
Automated Information - (816) 426-2481
Faxstat - (816) 426-3152
Fax - (816) 426-6537

Regions IX & X (IX – AR, CA, HI, NV, Guam, Samoa, X – AK, ID, OR, WA)
Box 36017
San Francisco, CA 94102
(415) 975-4350
Faxstat - (415) 975-4567
Fax - (415) 975-4371

The BLS produces free guides designed to familiarize individuals with the services they provide. These guides include:

a. **Major Programs, Bureau of Labor Statistics,** Provides an overview of the data gathered and reports made by the BLS. Quarterly updates are available.

b. **How to Get Information from the Bureau of Labor Statistics**. — A brochure summarizing publications and ways of obtaining them.

c. **New From BLS** (formerly **Just Published**) — Monthly listing of new publications. Regular mailings are available to anyone: request to be put on mailing list 321. Includes prices, order form, and description of services.

The BLS publications are classified into news releases, periodicals, bulletins and reports. Each of BLS's classifications are described below along with a listing of the publications most applicable to International Association of Fire Fighters' locals.

1. **News Releases** available free from BLS's regional offices. These news releases cover many areas of employment. Regular mailings of releases on specific subjects, such as the monthly employment situation, may be obtained by requesting to be included on BLS's mailing list.

The following are the most applicable news releases for IAFF locals:

a. **The Consumer Price Index** — presents the Consumer Price Index in two forms — the CPI-U and the CPI-W. The CPI-U covers all urban consumers while the CPI-W covers urban wage earners and clerical workers. Both indexes include monthly averages for the country as a whole. The same data is available for selected cities and regions of the country and is released monthly.

b. **Employment Cost Index** — provides an index which catalogs compensation of all types for both public and private sector employees. It also provides an index which covers wages and salaries only.

c. **Major Collective Bargaining Settlements** — provides current data on employee compensation, including highlights of collective bargaining activity and statistical summaries of wage and benefit changes and work stoppages. This is published quarterly in conjunction with the news release State and Local Government Bargaining Settlements and the periodical Current Wage Developments.

d. **State and Local Government Bargaining Settlements** — Provides current data on employee compensation, including highlights of collective bargaining activity and statistical summaries of wage and benefit changes and work stoppages. This is published twice-a-year in conjunction with the news release Major Collective Bargaining Settlements and the periodical Compensation and Working Conditions.

2. Periodicals are available by subscription or by single copies. They may be ordered from:

Superintendent of Documents
U.S. Government Printing Office
P.O. Box 371954
Pittsburgh, PA 15250-7954
Order and Information Line:
(202) 512-1800

The following are the most applicable periodicals for IAFF locals:

a. **CPI Detailed Report** — An in-depth analysis on consumer price movements. Includes charts and technical notes on the derivation of the CPI. This is published monthly at a cost of $26/year.

b. **Compensation and Working Conditions** — provides current data on employee compensation, including highlights of collective bargaining activity and statistical summaries of wage and benefit changes and work stoppages. This is published monthly at a cost of $9/year.

c. **Employment and Earnings** — provides current data on employment, hours, and earnings for the United States as a whole, for individual States, and for more than 200 local areas. This is published monthly at a cost of $35/year.

3. Reports containing information on BLS programs and/or national data are available free of charge from the Washington or regional offices.

Reports containing local or regional data are available free of charge from the originating regional office.

4. Bulletins may be obtained from:

   BLS Publications Sales Center
   P.O. Box 2145
   Chicago, IL 60690

   or from:

   Superintendent of Documents
   U.S. Government Printing Office
   P.O. Box 371954
   Pittsburgh, PA 15250-7954
   (202) 512-1800

The following are some applicable Bulletins for IAFF locals:

a. **Employment and Wages** — Provides employment figures, quarterly wages, and employer contributions to unemployment insurance and are categorized by industry, county, and state.

b. **Area Wage Surveys** — the average and distribution of straight-time earnings for certain occupations. The data is sorted by region and by selected areas, as well as being calculated on a national basis. Available for the entire country on a subscription basis or single copy for specific areas.

c. **Industry Wage Surveys** — monthly updates to the Area Wage Surveys

d. **Employee Benefits in Medium and Large Firms** — measures the following benefits in the private sector: lunch, rest periods, holidays, vacations, personal and sick leave, in addition to different types of insurance and pensions. This is useful to the IAFF because many of the same benefits apply to both public and private sector workers. This bulletin is published annually.

BLS publications are available at any time. Allow four to six weeks for delivery.

Many publications are available on microfiche or magnetic tape. If you want copies of items in these formats, call the BLS for more information.

BUREAU OF THE CENSUS

The Bureau of the Census is a division of the United States Department of Commerce. Its address is:

US Department of Commerce
Bureau of the Census
Washington, DC 20233
(301) 457-4100

Census publications are available through:

Superintendent of Documents
U.S. Government Printing Office
P.O. Box 371954
Pittsburgh, PA 15250-7954
(202) 512-1800

Among the publications potentially useful to IAFF locals are the following (A fee is charged for these. Check with the GPO for current price and latest available year.):

Statistical Abstract of the United States
Published yearly. Check with Government Printing Office for most current year and price.

County and City Data Book
This is a supplement to the Statistical Abstract. It contains official population information.

City Employment in 19—
County Government Employment in 19—
Both published annually. Most recent available issue generally two to three years behind current year.

City Government Finances in 19—
Published annually.

Appendix B:

Cost of Living Adjustments (COLAs)

A cost of living adjustment, (COLA), is an automatic change in wages during the life of a contract as a function of the changes in price levels. These price level changes are usually measured by the Consumer Price Index (CPI). Since there has been a steady increase in prices and in the Consumer Price Index over the past century, COLAs tend to increase wages.

COLAs are now included in many collective bargaining agreements because the adjustments maintain or improve the buying power of the negotiating unit. COLAs link wages to the change in the cost-of-living and should be used by union negotiators to accomplish the task of keeping wages comparable to the cost-of-living. To effectively use COLAs in the collective bargaining process, a complete understanding of the COLA is necessary.

History of the Cost of Living Adjustment

The COLA clause first appeared in union contracts shortly after World War I, which was a highly inflationary period. However, by the late 1920's prices had stabilized and interest in COLA clauses virtually disappeared.

The modern thrust for the use of the COLA in collective bargaining came from negotiations between General Motors and the United Automobile Workers (UAW) shortly after World War II. In 1948, General Motors Corporation and the UAW negotiated the first COLA clause to cover a significant number of workers nationwide.

In those days, the typical collective bargaining agreement was for one year's duration. The UAW and General Motors, however, reached an agreement whose term was five years. This was because of the inclusion of the COLA clause in the contract which removed a major stumbling block, namely inflation, to multi-year collective bargaining agreements. The COLA in this agreement assured the workers that inflation would not destroy the standard of living provided by their newly negotiated wage rates.

This specific COLA clause provided for an automatic adjustment in hourly wages every quarter, (three months), based upon changes in the Consumer Price Index. Depending on the movement of the CPI, wages could be adjusted both upward or downward. However, in no event could wages fall below the base wage rate levels established in the new agreement. In essence, there was a floor but no ceiling.

Since those days, the COLA has become fairly commonplace, even in agreements whose term is less than five years. In fact, between 1976 and 1984, over sixty percent of all workers under major private collective bargaining agreements were covered by a COLA clause. By 1987, that number had dropped to thirty-eight percent but inched up in 1988 to forty percent.

Even though COLAs exists predominantly in the private sector, COLAs have begun to spread, in one form or another, into the public sector. The major reason why COLAs are not used in more contracts is that COLAs are rare in agreements of less than two years' duration. The dominant opinion seems to be that it is not necessary to periodically adjust for the effects of inflation within such a short agreement period.

Like any other provision in the collective bargaining agreement, the details of the COLA are a matter for negotiations between the parties. Consequently, there are wide variations to be found in the design of a COLA from one agreement to the next. However, they all have the same basic purpose of protecting the buying power of workers' wages and salaries from erosion due to rising prices. The extent to which any particular COLA provides the desired protection depends upon the agreement the parties reach with respect to a number of important elements of the clause.

The Formula

Ideally, the COLA seeks to maintain, throughout the term of the agreement, the full buying power of the wage or salary that is established at the outset of the agreement. The COLA is written so that as the price level changes, the wage or salary will change proportionately.

There are two major approaches to COLA clauses. The first major type of COLA, Wages-For-Points, is designed to protect the average straight-time rate of the entire bargaining unit. To do this, the COLA stipulates the amount of change in the wage based on the change in the index points of the

CPI. This is how most COLA clauses operate in the private sector.

The other type of COLA, Percentage Based, is designed to protect the wage or salary of each individual employee. In one way or another, these COLAs generally provide that, at each adjustment, each employee's wage or salary shall be increased, (or decreased), by the same percentage by which the CPI has increased, (or decreased).

WAGES-FOR-POINTS COLAS

Under the first approach, the COLA is written in terms of index points. This means that a change in the wage is based on the change in the index points of the CPI. The original UAW-GM COLA negotiated in May 1948 exemplifies this type of COLA. This COLA clause stipulated that, for each 1.14 points change in the index points of the CPI, wages would be adjusted by one cent. Thus, if the index rose by 1.14 points, each member of the bargaining unit received an additional one cent per hour.

In this manner, every member of the unit receives the same money increase when the cost-of-living adjustments are made. Therefore, from a percentage point of view, during periods of rising prices, the high-wage employees get less, and the low-wage employees get more. Similarly, if prices were to decline, the low-wage employees would experience a greater reduction in terms of percent, while the high-wage employees would experience a smaller reduction, in terms of percent.

It should be noted that Wages-For-Points COLAs are not arbitrarily set. These COLAs reflect the precise relationship between the unit's average straight-time rate at a fixed time, and the level of the CPI that existed at that same time.

For example, the COLA clause in the 1948 UAW-GM contract stipulated a one cent per hour increase for each 1.14 points change in the CPI. This specifically reflected the relationship between the unit's average straight-time hourly rate of $1.485 as of May 1948, the date of the newly-negotiated agreement, and the CPI of 169.3, (1935–39 = 100), for the month of April 1948.

To establish the appropriate Wages-For-Points relationship in this specific situation, the index figure of 169.3 index points was divided by the hourly wage rate of 148.5 cents. This computation showed that each penny was worth 1.14 index points. Thus, to maintain the relationship agreed upon in the contract, each time the index rose by 1.14 points, the unit's average straight-time hourly rate would have to be increased by one cent per hour.

A COLA clause does not have to be written in terms of the hourly rate. Instead, the COLA clause can be written in terms of the weekly or yearly rate and still perform the exact same function of protecting wages from the effects of inflation. To show this, we will rework the previous cost-of-living adjustment into a weekly adjustment.

As previously stated, the unit received an average straight-time hourly rate of $1.485. Assuming that everyone in the unit worked forty hours per week, the average straight-time weekly rate would be $59.40. To establish the appropriate Wages-for-Points relationship, the index figure of 169.3 should be divided by the weekly wage rate of $59.40. This would show that each dollar per week was worth 2.85 index points. Thus, to maintain the relationship agreed upon in the contract, each time the index rose by 2.85 points, the unit's average straight-time weekly rate would have to be increased by one dollar.

PERCENTAGE BASED COLAS

Percentage based COLAs change each employee's wage by the same amount as the percentage change of the CPI. For example, if the CPI increased by ten percent over the stipulated measurement period, then each individual salary would be increased by ten percent. This type of COLA protects the exact wage of each individual employee, unlike wages-for-points COLAs which have different effects on different levels of salary.

However, percentage based COLAs do have shortcomings. Often these types of COLAs are written to provide adjustments on the basis of each full one-percent change in the CPI. For example, if during the measurement period the index rises by 1.9 percent, the employees will receive an adjustment of one percent and the remainder 0.9 percent will get carried over until the next adjustment becomes due.

Therefore, it is more beneficial for the employees if such percentage-type clauses stipulated that the wages or salaries will be adjusted in accordance with the full percentage change in the index, rounded to the nearest tenth of a point.

Inadequate Protection

Thus far, the discussion of the COLA, whether based on Percentages or Wages-For-Points, has assumed that full protection is provided by the clause against erosion in the buying power of the wage or salary. However, COLAs typically give workers less than 100 percent protection against inflation. Such contracts change wages by less than one percent for every one percent change in prices, and sometimes caps, (maximum allowable cost-of-living increases), are also specified. In fact, the COLA clauses between 1976 and 1984 only compensated for seventy percent of the rise in

the CPI. By 1987, the proportion of lost purchasing power recovered though COLA payments fell to fifty percent. In 1988, that number fell down to only forty-seven percent of the rise in the CPI.

The parties involved may be aware that there is inadequate protection but may accept it in order to achieve a settlement. However, it might also happen because of lack of understanding of the concept of an index number. Too frequently, this leads to equating one index point with one cent. This is wrong, and for the workers it can prove costly.

The only time one index point in the Consumer Price Index can be regarded as the equivalent of one cent in wages is when the two are equal. (This is discussed further in Chapter 2 which discusses the CPI in more detail.) The only time this will occur is when the total number of points in the index is the same as the total number of pennies in the particular wage.

For example, in January 1997, the CPI, (1982–84 = 100), for the United States was 156.3. If each index point were the equivalent of one cent, then the wage for any bargaining unit that month would have been $1.563 per hour. This certainly would not have been the case for a unit of fire fighters.

If a unit was averaging $12.00 per hour, then each index point was the equivalent of thirteen cents , (156.3 ÷ 1200), and not one cent. A COLA for such a unit of fire fighters, assuming a Wages-For-Points formula, would have provided full protection against inflation only if it had required that wages be increased by one cent for every 1/10 point change in the index.

Other Issues

The discussion to this point has focused on the development of the formula for the COLA and the problems associated with it. As pointed out earlier, gearing the adjustments to percent changes in the CPI may present fewer complications. However, there are other issues which must be resolved in designing a proper COLA.

CHOICE OF THE INDEX

The choice of the proper index is a very important decision. The COLA has to be based on a proper index for it to be credible. In most cases, the index used is the most up-to-date version of the Consumer Price Index because it accurately measures inflation.

The CPI is computed separately for certain metropolitan areas and regional sections, as well as on a national scale. The data is applicable to the specific area or region for which it is calculated. Larger, city-based unions will be able to use either data for their metropolitan area or one comparable, while smaller locals may have to refer to the national scale for a comparable reference.

REFERENCE DATE

The COLA clause must stipulate the starting point of the measurement of change in the CPI. The usual starting point is the latest monthly index that is available as of the effective date of the wages or salaries to be protected. Thus, if the new agreement is effective on July 1, 1996, the appropriate starting point would be the index for May 1996. Because of the lag in publication, this would be the latest index available as of July 1.

FREQUENCY OF ADJUSTMENTS

The COLA clause must also stipulate when the adjustments are to be made. Most COLA clauses in the private sector provide for adjustment quarterly, which is every three months. Practices in the public sector appear to provide for adjustments less frequently. If quarterly, the first adjustment for a COLA clause, whose starting point is the index for May 1996, would be based on the index for August 1996. The August index is published toward the end of September, so that the effective date of the adjustment would be around the first of October; the next adjustment would be based on the November index which is published toward the end of December, and effective around January 1, 1997.

For obvious reasons, employers tend to prefer longer intervals between the adjustments. It saves bookkeeping, and, more importantly, it saves them money during periods of inflation because there is a longer period of time that the wages are not protected from inflation. To the extent that it saves money for the employer, the clause is less effective for the employee. The longer the interval between adjustments when increases are due, the more the employee experiences the adverse impact of inflation on wages or salaries.

LIMITATIONS ON ADJUSTMENT

Typically, COLA clauses establish a wage floor. This means that adjustment clauses cannot serve to reduce wages or salaries below a certain point, regardless of how much the CPI declines. The floor would normally be the basic pay scales set by the newly-negotiated agreement that includes the COLA.

Some COLA clauses also provide upper limitations or caps. These clauses typically place a yearly limit on the amount of money that the employer will have to pay out under the COLA. This is a feature that would be promoted

by the employer as a means of limiting costs. Wage caps sometimes cover wage rates, other times the amount of the increase. The best contract would not have a wage cap, but it is often unavoidable.

INCORPORATION OF ADJUSTMENTS

During the life of an agreement, the adjustments are generally not incorporated into the basic rates of pay. The payments to the employees resulting from the COLA are considered a "float," which may be increased or decreased in accordance with movements in the CPI.

To this extent, the clause should be written to require that this "float" be considered part of wages or salaries for purposes of computing the employees' overtime pay, holidays, vacations, sick leave, pensions, and other fringe benefits.

Moreover, at the time the next agreement is negotiated, all prior cost-of-living adjustments should be incorporated into the basic pay scales. They should not be left as a "float" during that successor agreement. Instead, they should become part of the basic rates that are protected by the floor written into the COLA clause of the new agreement.

Sample Clauses

Two sample clauses appear below. One exemplifies a COLA based on percentage adjustments, while the other exemplifies a Wages -for-Points adjustment. The following set of assumptions have been used for both clauses, in order to demonstrate the impact on the salary of a unit of fire fighters.

1. The effective date of the agreement is July 1, 1995, and it is a two year agreement.
2. The pay scales set by that agreement are as follows:

Private - step 1	$32,100
Private - step 2	$33,100
Lieutenant	$35,500
Captain	$36,500

3. The average weighted annual salary for the unit, as of July 1, 1995, is $33,875.
4. It is likely that, in a two-year agreement, the unit would also be receiving a deferred pay increase during the life of the contract. That factor will not enter into this discussion.

SAMPLE ESCALATOR CLAUSE— STRAIGHT PERCENTAGE

Section 1 — In addition to the basic salary scales specified in this Agreement, all employees covered by this Agreement shall be paid a cost-of-living allowance, to be determined on the basis of changes in the Consumer Price Index — All Items, for the United States (1982–84= 100), published by the Bureau of Labor Statistics of the U.S. Department of Labor.

Section 2 — The cost-of-living allowance shall be based on changes in the Consumer Price Index between May 1994 and each of the following months: 1994: August, November; 1995: February, May, August, November; 1996: February, May.

Section 3 — The percentage change, if any, between the Consumer Price Index for May 1994 and for each of the months listed above shall be applied to the basic salary for each classification, computed to the nearest dollar, in order to determine the cost-of-living allowance that shall be paid to each employee during each subsequent quarterly, (three month), period.

Section 4 — The cost-of-living allowance shall be paid beginning with the start of the first pay period that commences following publication of the Consumer Price Index for each of the months listed above.

Section 5 — The cost-of-living allowances shall be used in the computation of straight-time, overtime, and all other allowances and benefits.

Section 6 — This cost-of-living provision shall be applied to increase or reduce pay, but in no event shall it operate to reduce the salaries below the basic salary scales specified in this Agreement.

Section 7 — No adjustments, retroactive or otherwise, shall be made due to any revision which may later be made in the published figures for the Consumer Price Index.

Before going on to the second sample clause, it might be well to note here the nature of the impact of this percentage approach on the assumed unit of fire fighters.

Between May 1994 and August 1994, the Consumer Price Index, (1982–84 = 100), rose from 144.9 to 146.5. The percentage change in the CPI is 1.10 percent, ((146.5 - 144.9) ÷ (144.9) x 100). The adjustments are:

Private - step 1	$353, ($32,100 x .0110)
Private - step 2	$364, ($33,100 x .0110)
Lieutenants	$391, ($35,500 x .0110)
Captains	$402, ($36,500 x .0110)

These are the allowances that employees in each classification would have received from approximately October 1, 1994, which is the start of the first pay period commencing after publication of the index for August, to December 31, 1994. At this time the next adjustment, (based on the November 1994 CPI), will have occurred.

The November 1994 CPI moved up to 147.3. The percentage change in the CPI over the May figure was 1.66 percent, ((147.3 - 144.9) ÷ (144.9) x 100). Consequently, for the quarterly period beginning around January 1, 1995, the cost-of-living allowances adjustments are:

Private - step 1	$533, ($32,100 x .0166)
Private - step 2	$549, ($33,100 x .0166)
Lieutenant	$589, ($35,500 x .0166)
Captain	$606, ($36,500 x .0166).

The average increase for the entire unit would be $562, ($33,875 x .0166), for the adjustment period beginning around January 1, 1995. For the earlier adjustment period, the unit's average allowance would have been $373, ($33,875 x .0110).

This latter computation will take on some additional meaning as we move through the second sample clause, which demonstrates the Wages-for-Points approach.

SAMPLE ESCALATOR CLAUSE — WAGES-FOR-POINTS

Before this type of clause can be drafted, some computation is required. The relationship of the Fire Fighter's salary to the Consumer Price Index must be established.

The salary the clause will seek to protect is as of July 1, 1994. As of that date, the unit's annual average salary was $33,875, or $651.44 per week. The relevant CPI, for the month of May 1994, was 144.9. When 144.9 index points are divided by $651.44, it yields 0.2224, or 0.22. Thus, each 0.22 points in the CPI would be worth one dollar in weekly salary.

Now, the second sample escalator clause can be designed:

Section 1 — In addition to the basic salary scales specified in this Agreement, all employees covered by this Agreement shall be paid a cost-of-living allowance, to be determined on the basis of changes in the Consumer Price Index — All Items, for the United States (1982–84 = 100), published by the Bureau of Labor Statistics of the U.S. Department of Labor.

Section 2 — The cost-of-living allowance shall be based on changes in the Consumer Price Index between May 1994 and each of the following months: 1994: August, November; 1995: February, May, August, November; 1996: February, May.

Section 3 — The cost-of-living allowance for each employee covered by the Agreement shall be one dollar per week for each 0.22 points change in the Consumer Price Index between May 1994 and each of the months listed above.

Section 4 — The cost-of-living allowance shall be paid beginning with the start of the first pay period that commences following publication of the Consumer Price Index for each of the months listed above.

Section 5 — The cost-of-living allowance shall be used in the computation of straight-time, overtime, and all other allowances and benefits.

Section 6 — This cost-of-living provision shall be applied to increase or reduce pay, but in no event shall it operate to reduce the salaries below the basic salary scales specified in this Agreement.

Section 7 — No adjustment, retroactive or otherwise, shall be made due to any revision which may later be made in the published figures for the Consumer Price Index.

It was noted earlier that, between May 1994 and August 1994, the Consumer Price Index rose by 1.6 points. Thus, the first adjustment payable from October 1 to December 31 under this second escalator clause would have been $7.27 (1.6 points ÷ 0.22).

The November 1994 CPI was 2.4 points higher than the May index. Thus, beginning around January 1, 1995, the adjustment would have been increased to $10.91 (2.4 ÷ .22).

Although the two approaches are of a different form, the effects are the similar since both provide for full coverage of the effects of inflation. The percentage-based clause adjusted the average salaries by $373 or $7.17 per week for the first adjustment period and by $562 or $10.81 per week for the second adjustment period.

The wages-for-points clause proved for an adjustment of $7.27 per week for the first adjustment period and $10.91 per week for the second adjustment period.

This brings into focus the fundamental distinction between the two approaches in designing the formula for a COLA clause. The total amount of money received by the unit would be the same in both cases. In the Wages-For-Points approach, everyone in the unit receives identical adjustments. In the percentage-based approach, the same amount of money is involved, but it is distributed based on the employee's salary classification.

COLAs provide a way for the union to buffer its members against the effects of inflation. It is not always one hundred percent effective, but it does give at least a measure of protection to workers so that, even with rising inflation, the value of the wages will not be eroded as quickly.

Appendix C:
Urban Family Budgets

The Urban Family Budgets represent another type of benchmark that may be used to support a pay increase. Urban Family Budgets are designed to show how much it costs a family to live at three different standards: (a) a lower budget level, (b) an intermediate budget level, and (c) a higher budget level.

The Urban Family Budgets were developed and compiled by the U.S. Bureau of Labor Statistics until 1981. The AFL-CIO began compiling the budgets in 1981, using the same methodology developed by BLS.

This methodology defines the precise amounts and qualities of goods and services that are specified to portray the three relative standards of living. These budgets are for a precisely defined urban family of four which includes a thirty-eight year old husband who is employed full-time, his non-working wife, a boy of thirteen, and a girl of eight. Also, after about 15 years of married life, the family is settled in the community and the husband is an experienced worker. The family has, for each budget level, average inventories of clothing, house furnishings, major durables, and other equipment.

The budgets do not represent how families of this type actually do or should spend their money, nor are they intended to represent a minimum level of adequate income or a subsistence level of living. Rather, they reflect the assumptions made about the manner of living at each of the three hypothetical levels.

The budgets are computed for (a) the "urban" United States as a whole and (b) twenty-five individual cities. Comparable regional data for the metropolitan areas are not published. Therefore, local unions outside the twenty-five individual cities must rely on the national estimate or, if the reasons for doing so are sufficiently persuasive and credible, on the estimates for one of the twenty-five cities.

Since the Spring of 1967, when the budgets were first designed by BLS, the budgets have been updated based on the change in the prices reflected by the Consumer Price Index. Also, adjustment factors have been published which make it possible to compute budget-cost estimates for families whose age and size composition may vary from the defined family.

Table C–1 shows the Urban Family Budgets estimates for 1995.

Table C–1
Urban Family Budget Estimates
Annual Estimates for 1995

	Lower Budget	*Intermediate Budget*	*Higher Budget*
National	$22,479	$38,192	$55,022
Anchorage	$31,450	$42,721	$58,539
Atlanta	$20,452	$35,110	$50,416
Baltimore	$22,173	$37,495	$54,590
Boston	$26,300	$45,125	$67,319
Buffalo	$20,377	$38,558	$54,542
Chicago	$22,633	$37,716	$53,686
Cincinnati	$21,774	$38,023	$52,844
Cleveland	$21,224	$37,393	$52,900
Dallas	$19,474	$33,278	$48,061
Denver	$21,628	$37,005	$53,120
Detroit	$20,307	$36,055	$52,001
Honolulu	$35,833	$53,800	$82,015
Houston	$19,477	$33,622	$48,001
Kansas City	$20,186	$35,384	$51,392
Los Angles	$24,119	$36,588	$54,033
Milwaukee	$24,835	$42,417	$61,153
Minneapolis	$21,198	$37,633	$54,198
New York	$25,463	$46,236	$71,336
Philadelphia	$24,784	$41,773	$60,720
Pittsburgh	$20,407	$35,515	$50,925
St. Louis	$21,224	$36,082	$51,164
San Diego	$21,616	$35,543	$52,019
San Francisco	$24,721	$38,915	$56,451
Seattle	$25,253	$37,889	$53,083
Washington, DC	$26,589	$42,158	$62,071

The Composition of the Budgets

When developing the various budgets, differences in climate and other local conditions, as well as preferences and habits, are taken into account in the construction of the market baskets of goods and services for the various areas. In some areas, for example, because of climate, housing and fuel costs are a smaller proportion of the budgets.

The differences in costs for the lower, intermediate, and higher budgets reflect differences in living standards. For the design of each of the budgets, the specific allocations of expenditures were derived from detailed surveys of spending practices of urban families, and involved the use of experts to determine the requirements for a family's physical and social well being. Thus, the U.S. Department of Agriculture's different family food plans were used in making judgments on the types and amounts of food, and housing needs were based on standards established by the U.S. Public Housing Administration.

As might be expected, the lower-budget family ends up with very little discretionary consumption, and a larger proportion of its outlays are for essentials such as food, rent, and medical care.

At the intermediate standard, there is somewhat more opportunity to make choices, but not much more, while the higher standard assumes that the family will have more opportunity for flexibility in allocating expenditures between essential and nonessential items. Each budget also assumes different degrees of flexibility and preference with respect to the quality of items to be purchased.

The lower budget represents a minimum of adequacy, and a yardstick that may be useful in establishing goals for public assistance and income maintenance programs.

The intermediate budget is considered to represent a living that satisfies the prevailing standards of what is necessary for health, efficiency, the nurture of children, and for participation in community activities. It is basically an attempt to describe and measure a modest but adequate standard of living because it provides for the basic amenities, and for only a few items and expenditures that might be regarded as non-essential.

However, the intermediate budget does exclude many things that some people take for granted. For example, while the budget provides for a car, it is not a new car. The car in the intermediate budget is a used car of two years, and the family is presumed to buy one every four years. The husband is allowed a new suit every four years, or a new summer suit every twelve years. It is presumed that the couple goes to the movies once every three months, and that the family's television set will last for ten years, its vacuum cleaner for fourteen, its range for seventeen, and its toaster for thirty-three years.

Also, there is no allowance to pay for credit charges, although most American families buy items on time and must pay both credit and carrying charges. Nor is there included any allowance for savings, towards a college education for children.

The higher budget is likewise quite modest in concept. It differs little from the intermediate budget, and is based on the life style of people who more frequently own homes rather than rent, and have a more complete inventory of household appliances, such as a dishwasher and dryer. The higher standard is intended to reflect a manner of living sometimes known as the American standard of living.

It is far from a luxury budget, and is "higher" only in relation to the other two budgets. For example, allowance for the purchase of an automobile is based on a cost estimate which assumes that sixty percent of the families at this level of living buy new cars, while the other forty percent buy two-year old cars and in both cases, the transaction takes place once every four years.

It follows, of course, that at each standard, the larger the family the higher the income required, while the smaller family the less would be the income needed.

Using Family Budget Data

There are several ways in which to employ the family budgets to support a wage demand. The most obvious involves the direct comparison between the salary and the budget, assuming, obviously, that the salary is less than the budget.

There is, of course, no "right" to be paid a salary equal to the budgets, at whatever level. However, the budgets are handy yardsticks. Because they have been designed with some care and precision, they give added credibility to union demands with regards to the workers' income needs.

Typically, unions use the intermediate budget to demonstrate the lag in their pay scales. The principal point made through such a comparison is that the members should be able to live at least at the level represented by the intermediate budget, particularly since it is a modest standard.

In this type of comparison, which is designed to lay claim to a salary equal to the budget figure, it should be remembered that the "breadwinner" in the budget family is a thirty-eight year old male. Thus, he has several years of work experience behind him.

Consequently, the salary that is relevant in making comparisons with the budget must be the salary of a fire fighter who has been in the fire service for a number of years and as such, the figure must include longevity payments, if applicable.

There are a number of situations in which the fire fighter's salary may exceed the cost of the intermediate budget. In such cases, the comparisons could be keyed to the higher budget which, as the earlier description indicates, also represents a living standard that is rather modest.

Remember that the existence of the budgets, whether the lower, the intermediate, or the higher, does not mean that everyone is necessarily entitled to be paid a salary equal

to those budget costs. Therefore, the dollar gap between a fire fighter's salary and the budget — at any level — can not serve as the principal feature of a union's case.

Another way in which the BLS family budgets may be used involves comparisons over a stretch of time. This is, in reality, another way to demonstrate the impact of rising prices on the worker's standard of living. In this use of the budgets, a comparison is made between the increase in the cost of the budget over some time period, and the increase in the worker's salary over that same time period. This type of comparison is demonstrated in Table C–2.

According to the information in Table C–2, the increase in salary has been less than the increase in the cost of the budget. The salary was only 93.4 percent of the cost of the budget in 1990, and in 1995 it came to 91.9 percent of the budget cost. Since the standard of living represented by the budgets is the same for both 1990 and 1995, only the cost has changed. Therefore, the standard of living for the fire fighters in this example has declined in 1995 as compared to 1990. Their 1995 salaries will buy a smaller portion of the standard represented by the family budgets than did their 1990 salaries.

For the 25 cities that are used to compute separate urban family budgets, the opportunity exists to use those data for an inter-city comparison. These inter-city comparisons would seek to establish that the relationship between the fire fighter's salary and the budget figure, for the area in which the negotiating local resides, is less favorable than the relationship between the salaries and budget figures in other areas.

Table C–2
Comparison of Fire Fighter's Maximum Salary* With the Cost Of The Intermediate Family Budget for the United States

1990		*1995*		*Salary as a Percent of Budget*	
Salary	*Budget*	*Salary*	*Budget*	*1990*	*1995*
$30,573	$32,719	$35,110	$38,192	93.4%	91.9%

* After 20 years of service

As Table C–1 shows, the budget costs vary from one metropolitan area to the next. In other words, it costs more to live in some areas than in others. These inter-city comparisons can help establish the comparative values of the salaries in the different cities.

For example, assume that the fire fighters in City A have a salary of $37,995, while the salary of fire fighters in City B is $35,885. There appears to be a differential of $2,110 in favor of City A.

However, the apparent advantage of City A may disappear when the two salaries are stacked against the living costs in their respective areas. This can be done using the urban family budget figures for the different areas because the separate area figures are measuring how much it costs to have the same standard of living in different areas.

Accordingly, assume for the purposes of our example, that the cost of the intermediate budget is $38,915 in City A, and $35,515 in City B. In City A, the salary-to-budget relationship is 97.6 percent, ($37,995 ÷ $38,915), whereas in City B, it is 101.0 percent, ($35,885 ÷ $35,515).

Therefore, the salary in City B is worth more in relation to the cost of the intermediate budget than is the salary in City A, even though the latter salary is higher. The salary in City B represents a higher standard of living than does the salary in City A. If the salary in City A were to be "equalized," in terms of buying power, with the salary in City B, it would have to be $39,304, ($38,915 x 1.010), or 1.0 percent higher than the budget cost of $38,915.

At this point it is important to recall some basic points that should be kept in mind when using urban family budgets in developing a salary case. The first point is that the budget figures are for a family of four, where the head of the household is thirty-eight years of age. Accordingly, he is well advanced in his working career. In terms of the fire service, this means someone who has a number of years of service, and is likely receiving longevity payments.

Secondly, it is frequently necessary to adjust the budget figures in order to "update" them to coincide with the effective dates of the salaries that are involved in the comparison. Suppose, for example, that the latest salary in our comparison was effective in April 1994. Suppose, too, that the latest budget figure has a reference date of Autumn 1995. To sharpen the comparison between the salary and the budget cost, we should produce an estimate of the cost of that budget as of April 1994. Comparing an April 1994 salary to an Autumn 1995 budget, especially during a period of rapidly rising prices, produces a distorted picture.

A final point to be kept in mind is that, in any inter-area comparisons, problems associated with the selection of the universe arise. As mentioned earlier, the selection of cities included in such a comparison must have some logical basis. The most common criterion, in the case of cities, is size. However, this can not be the only criterion.

Urban Family Budgets can be obtained in memo form from:

The American Federation of Labor and the Congress of Industrial Organizations
Public Policy Department, Room 504
AFL-CIO Building
815 16th Street NW
Washington, DC 20006
(202) 637-5177


LACOFD

Appendix D:
American Arbitration Journal Article

Wage Disputes in Interest Arbitration: Arbitrators Weigh the Criteria

by Gregory G. Dell'Omo

Gregory G. Dell'Omo is an assistant professor of management at Canisius College in Buffalo, New York

This article reports the results of a series of interviews with Wisconsin interest arbitrators, which was part of a larger experimental study that provides insight into how and why arbitrators apply different, and often conflicting, wage criteria when deciding public sector interest arbitration cases. The issues discussed with the arbitrators included: their overall decision making policies; the relationships among various equity standards; ability-to-pay criteria; and statutory criteria.

The results show that the arbitrators' subjective and objective decision making policies are rather similar, which indicates a high level of insight about their own decisions. As for comparability, the majority of arbitrators tend to lean initially toward internal comparisons based on percent increases. The arbitrators also discuss the need for ability-to-pay arguments to be specific and well-supported before granting this criterion greater weight in their decision making. Finally, the desire to have information describing the historical relationship between the parties was voiced throughout the interviews. Most of the arbitrators appeared hesitant to disrupt these relationships without specific circumstances to justify such action.

The role of the neutral in public sector interest arbitration has been the subject of much debate, particularly with respect to the manner in which arbitrators decide cases.[1] With many interest arbitration laws listing statutory criteria that must be followed by arbitrators when formulating their awards,[2] much of this discussion has centered on the application of these criteria. This has been especially troublesome, because most of the laws do not specify the weight arbitrators must apply to individual criteria.

More specifically, these debates traditionally have been directed toward the relative emphasis placed on three categories of criteria: (1) comparisons with other employee groups (comparability); (2) the ability of the public employer to pay; and (3) changes in the cost of living. The concern has been that because different applications of these criteria may reflect conflicting views regarding the allocation of public resources, choosing among them poses a problem for arbitrators, as well as for the integrity and usefulness of the process.[3]

As part of this ongoing debate. there has emerged a renewed interest in research on the arbitral decision making process.[4] While many of these studies have focused on how arbitrators combine the facts of the case with the parties' offers when developing their notions of a "fair award," more still needs to be learned regarding the basic issue of how much weight arbitrators give to the different facts.

This article reports the results from a series of interviews with 22 "mainline" arbitrators in Wisconsin.[5] These interviews were part of a larger experimental study conducted in 1986–1987 that was designed to capture empirically the decision making policies of arbitrators acting under the final-offer procedure as stated in the Wisconsin Police and Fire Fighter Arbitration Act (WPFAA)[6]

1. See, generally, Homer C. La Rue, "An Historical Overview of Interest Arbitration in the United States," *The Arbitration Journal* 42 December 1987): 19-22.
2. See Peter Feuille and Susan Schwochau, "The Decisions of Interest Arbitrators," *The Arbitration Journal* 43 (March 1988): 32. at note 11.
3. Michael Fox, "Criteria for Public Sector Interest Arbitration in New York City: The Triumph of 'Ability to Pay' and the End of Interest Arbitration," *Albany Law Review* 46 (1981): 99-100
4. Odev Ashenfelter and David E. Bloom, "Models of Arbitrator Behavior: Theory and Evidence," *American Economic Review* 74 (March 1984):111-124; Max H. Pazerman, "Norms of Distributive Justice in Interest Arbitration," *Industrial and Labor Relations Review* 38 (July 1985): 558-570; Max H Pazerman and Henry S. Farber, "Arbitrator Decision Making: When Are Final Offers Important?," *Industrial and Labor Relations Review* 39 (October 1985): 76-89; David E. Bloom, *Arbitrator Behavior in Public Sector Wage Disputes* (Cambridge, MA: National Bureau of Economic Research, Working Paper No. 2351, 1987); David E Bloom, "Empirical Models of Arbitrator Behavior Under Conventional Arbitration," *Review of Economics and Statistics* 68 (November 1986):578-585; Henry S. Farber and Max H. Bazerman. "The General Basis Of Arbitrator Behavior: An Empirical Analysis of Conventional and Final-Offer Arbitration," *Econometrica* 54 (November 1986): 1503-1528; Feuille and Schwochau, "The Decisions of Interest Arbitrators," supra note 2; and Susan Schwochau and Peter Feuille, "Interest Arbitrators and Their Decision Behavior," *Industrial Relations* 27 (Winter 1988): 37-55.
5. These 22 are referred to as "mainline" arbitrators because of their extensive experience with public sector interest arbitration in Wisconsin. In fact, this group of arbitrators decided approximately 82 percent of all public sector interest arbitration cases (831) in Wisconsin between 1979 and 1985.
6. Wis. Stats. §111 .77.

Table D–1
Criterion Definitions

Criterion	*Definition*
Internal percent increase (INTP)	The average percent increase recently negotiated by all union employees in the focal city (the city employer involved in the particular police officer wage dispute), excluding fire fighters.
Hourly wage rate for fire fighters (FIRR)	The average hourly wage rate recently negotiated by the fire fighters under the employ of the focal city employer.
Percent increase for fire fighters (FIRP)	The average percent increase recently negotiated by the fire fighters in the focal city.
External hourly wage rate for police officers (EXTR)	The average hourly wage rate recently negotiated by the unionized police officers in an agreed-upon group of external comparable cities.
External percent increase for police officers (EXTP)	The average percent increase recently negotiated by the unionized police officers in the agreed-upon group of external comparable cities.
Tax rate (TAXR)	The current full-value rate effective, which was reflected in a city's planned budget. This rate indicated that for every dollar of property value (full value), a city taxpayer paid X cents in property taxes.
Expenditures (EXPD)	The projected police department operating expenditures shown as a percentage of its total operating expenditures.
Workload (WORK)	The average number of index crimes (violent crimes and property crimes) per 1,000 population, plus the average number of reported traffic accidents (those that involved fatalities, personal injury, or property damage above $500) per 1,000 population.
Cost of living (COL)	The percent change in the consumer price index over the previous 12-month period, with the assumption that the percentage would remain constant over the next 12 month period.

The following is the criteria to be applied under the Wisconsin Police and Fire Fighter Arbitration Act:

Under Wis. Stats. § 111.77(6), the arbitrator is instructed to give weight to the following criteria:

- stipulations of the parties;
- the lawful authority of the employer;
- the ability of the government unit to pay;
- the interest and welfare of the public;
- comparisons with terms of employment of other employees in public and private employment performing similar work;
- the cost of living; and
- other factors normally and traditionally taken into account in determining wages and conditions of employment in the public service and private employment.

Table D–1, above, lists the Criterion and their definitions.

Interview Results

At the conclusion of the experimental exercise, each arbitrator was interviewed for the purpose of clarifying and explaining the different aspects of his or her decision making policies. The interviews, though essentially unstructured, consisted of a uniform set of eight questions that were specifically designed to capture additional information relating to

the arbitrators' views on: (1) their overall decision making policies; (2) the relationships among the various equity standards; (3) the ability-to-pay criterion; (4) the importance of statutory criteria; and (5) the criteria included in the study.

Table D–2 shows the average relative weights for each criterion as well as the standard deviations.

Table D–3 shows the average total relative weights for Equity Standards.

Table D–2
Average Relative Weights for Each Criterion (and Standard Deviations)

Criterion	*Average Relative Weight (%) (Standard Deviations)*
Cost of living (COL)	7.0, (8.6)
External percent increase for police officers (EXTP)	12.3,(12.2)
External hourly wage rate for police officers (EXTR)	16.5,(25.9)
Percent increase for fire fighters (FIRP)	16.7,(14.6)
Hourly wage rate for fire fighters (FIRR)	12.5,(19.1)
Internal percent increase (INTP)	17.1,(14.8)
Expenditures (EXPD)	10.0, (7.9)
Workload (WORK)	5.1, (9.0)
Tax rate (TAXR)	2.7, (3.9)
Average R2 range	0.67,(0.41–0.84)

Table D–3
Average Total Relative Weights for Equity Standards

Equity Standards	*Total Average Relative Weight (%)**	*Difference in Totals (%)*
Internal equity	46.3 (1.9–89.3)**	17.5
External equity	28.8 (1.6–92.6)	
Anchor equity	46.1 (1.9–84.4)	17.1
Absolute equity	29.0 (1.0–92.6)	
Parity	29.2 (0.0–68.4)	

* These are computed by adding the relative weights applied by all the arbitrators to the individual criteria that form each standard and then calculating the average.
**Ranges of relative weights appear in parentheses.

Decision Making Process

Question 1 asked the arbitrators to provide an overall description of the decision making process that they employed in the case exercises. While the descriptions varied in detail, one general response was elicited, together with five other responses worth noting.

First, the majority of arbitrators, (15), indicated that the initial step in their decision making process involves looking for internal wage-settlement patterns, (usually based on percent increases). If a clear and consistent pattern was observed, then the final offer closest to the pattern would most likely be selected. If such a pattern was not observed, the arbitrators turned to the external comparability factors for guidance. If an answer was still not clear or if the internal and external factors were in conflict, cost of living was then used as a "tie breaker," followed next by the ability-to-pay criteria. The reasoning for cost of living playing a secondary role was best described by one arbitrator who stated:

> I think arbitrators have generally come to the view that the voluntary settlements your group is being compared with have made the determination of how much insulation or protection against cost-of-living increases ought to be awarded. Therefore, cost of living has already been incorporated in the other voluntary settlements you are using as comparable. If, however, your case is the pattern setter or the first case within the comparable group to be decided, then cost of living is given primary consideration.

In contrast to the first group, the second group consisted of two arbitrators who began by observing the external pattern of police wage settlements and then considered internal settlements. One of these arbitrators made a special point of comparing the final offers to the external wage settlements, using the relative positions of the expenditure and workload rates as an overall guide.

The third group, consisting of two other arbitrators, placed initial emphasis on cost of living. This emphasis served more as a measure of the "general reasonableness" of the two final offers, rather than as the primary factor in the arbitrators' decision making policies. After this initial review, the arbitrators in this group looked at the external wage rate and the workload index. If an answer was not clear at this point, they referred to the internal comparable.

The remaining three arbitrators gave idiosyncratic responses. One indicated simply going down the list, noting how each criterion related to the final offers, and then totaling the number of criteria favoring each offer. The final offer with the most criteria was the one usually selected. Another arbitrator relied almost exclusively on the external wage-rate criterion. The final arbitrator's primary concern was to determine the employer's relative willingness to tax and expend monies on police operations, followed next by the fire fighters' internal wage settlements, and finally by the external factors.

Internal vs. External Comparability

Question 2 asked the arbitrators to comment on the relative importance they place on internal comparability versus external comparability. Although the responses were generally conditional, the majority of arbitrators, (14), stated that they place more importance on internal comparability. This emphasis, however, may have begun to be applied only recently. As one arbitrator stated:

> Over the years, the emphasis has changed from strict adherence to external comparability to more emphasis on internal comparisons or patterns. This has been due to the high inflation years in the late 1970's and early 1980's, and the more recent economic problems experienced by cities; both of which act as a constraint as to what an employer can pay.

This change in emphasis was also observed in the arbitrators who expressed a preference for external comparability. Three of the four arbitrators in this group conditioned their preference for external comparability with the statement, "absent any ability-to-pay problems by the employer…."

The remaining four arbitrators could not indicate any preferences, but instead offered the following observations: (1) the need to know both the internal and external historical rankings of the bargaining unit in question to determine which form of comparability will be most important; (2) internal and external comparability are equally important; (3) internal comparability is more important in cases involving big cities, and external comparability is more important in smaller cities; and (4) external comparability is more important in terms of wage rates, and internal comparability is more important in terms of percent increases. The arbitrator who offered this final observation, however, went on to state that

> where wage rates are relatively comparable (externally) and where percent increases are generally in line internally, the internal comparable govern the dispute. Otherwise, external comparability is more important if no consistent pattern of percent increases exists internally.

Anchor vs. Absolute Equity

Question 3 asked the arbitrators to comment on the relative importance they place on percent increases (anchor equity) versus wage rates (absolute equity) when determining wage comparability. All but four of the arbitrators, (18), generally indicated that absent any specific catch-up situation (and, to a lesser degree, any excessive increases in costs of operation), percent increases are more important because they serve to maintain pre-existing wage relationships.

Of the four arbitrators who did not indicate a preference for percent increases, three clearly stated that they preferred wage rates as the unit of comparison. One arbitrator explained reliance on wage rates by simply noting, "I just look at wage rates — percents don't mean anything." Another was more philosophical, declaring that "you can't eat percentages, you can eat with dollars … we [arbitrators] get hung up on percentages — the rich get richer and the poor get poorer on a percentage basis."

Parity

Question 4 asked the arbitrators to offer their views on the issue of parity between fire fighters and police. Most of the arbitrators, (15), claimed that their position on this issue depended on the historical relationship between the units. Within this overall group, however, three different positions were observed. One position, taken by five arbitrators, was to rely solely on the historical relationship, with no predetermined position either for or against parity. A second position, taken by eight arbitrators, was an inclination toward parity, in one form or another, absent a historical relationship of no parity. The third position, taken by two arbitrators, was an inclination against parity, absent a clear history of such a relationship.

Six arbitrators stated that they placed little, if any, importance on the parity issue. Three argued that the different levels of skill, responsibility, and danger associated with each job militated against a parity relationship. The position of the other three was best described by one who stated:

> Although it is right for the arbitrator to consider the wages of other groups, no particular group has a right to parity with another particular group just as a matter of right — each party must bargain for itself.

Not having done many cases involving parity, the remaining arbitrator indicated no strong feelings on this issue.

Importance of Ability to Pay

Question 5 asked the arbitrators how the employer's budget influenced their decision making processes.[7] The general conclusion was that absent a specific ability-to-pay argument, the budget carried little weight on its own. Although a few claimed to give it some consideration, especially in very close cases, the majority of arbitrators recognized the self-serving nature of such arguments. As one arbitrator noted, "any good city budget manager can manipulate the budget to look like the city can't afford anything — relying on this type of information is not bargaining."

A few other arbitrators carried this position further by contending that the budgetary argument merely represents an "unwillingness to pay" argument. If the comparability criteria (both internal and external) plus cost of living justify the selection of the union's final offer, and this in turn requires additional taxation or changes in budget allocations, "so be it." These arbitrators agreed that absent the ability-to-pay argument, the unwillingness to pay cannot offset the equity considerations simply because they result in some unpleasant political decisions.

Two arbitrators did state, however, that their decisions are affected by the budgetary argument. One arbitrator felt that if there was any evidence that the selection of the union's final offer would result in tax increases, management's final offer would be preferred. The other arbitrator noted that "although a budget is just a plan … and what the employer actually spends is what is important, I give the city's willingness to save money a great deal of weight."

Defining Ability to Pay

Question 6 asked the arbitrators how they would define "ability to pay." Although most were able to discuss a range of economic factors that they consider relevant to the issue, it was generally noted that the concept as a whole is

7. It should be noted that as part of the experimental exercise, the arbitrators were presented with employer and union arguments regarding the reasonableness of the respective final offers. The employer's argument was that the city budget had already been adopted for the fiscal year question, and since its offer was the figure used in the budget, acceptance of the union s final offer would result in a budget deficit The employer went on to state that its final offer was both equitable and economically appropriate, given that the selection of the union s final offer would require an increase in taxes and/or budget cuts in the police department The union essentially argued that its final offer was not only more equitable, but that the arbitrator's authority to select the union's final offer should not be automatically restricted by a planned budget unilaterally created by the employer.

very difficult to define. Addressing this difficulty one of the more experienced arbitrators recalled Supreme Court Justice Lewis Powell's comments on pornography — "I can't tell you what it is, but I know it when I see it." In many respects, these words summarize how most of the arbitrators described their approach to this issue.

Despite the general lack of specificity associated with this issue, all the arbitrators were of the position (in one form or another) that although ability to pay is a very important criterion, an employer must competently demonstrate a "substantial," if not "drastic," financial situation before the arbitrator will grant it decisive weight. Arguments unsupported by specific evidence, or supported by self-serving budgetary considerations, are not enough to prove inability to pay.

Within this position, however, arbitrators differed with respect to the extent an employer must prove its case. As mentioned above, many of the arbitrators were able to discuss the economic factors they considered relevant, but only one arbitrator appeared to have a set of standards by which to judge an employer's ability-to-pay argument. According to this arbitrator, an employer making this claim must demonstrate the following: (1) that there have already been reductions/sacrifices in services that affect programs adversely; (2) that the tax levies that support these programs have become noncompetitive or demonstrably unacceptable politically; and (3) that long-term deficit financing has been required that is not customary in the particular sector.

In contrast, a few other arbitrators, who were much less specific, argued that the employer's task is virtually insurmountable. This position is based on the technical notion that because a taxing body always has the right to raise taxes — absent a public referendum stating otherwise or any legal limits — and/or realign expenditures, an inability-to-pay claim is very difficult to prove. In addition, one arbitrator suggested that even when there is evidence supporting this claim, comparability is still very important because, in most cases, the comparable cities have similar financial problems.

Statutory Criteria

Question 7 asked the arbitrators whether their decision making processes would be any different if the criteria were not outlined in the Wisconsin Police and Fire Fighter Arbitration Act. Fifteen arbitrators said that they would not, the primary reason being that these criteria are commonly found in other state statutes as well as in the private sector. As one arbitrator noted, "a common law has developed in interest arbitration and the same criteria would be used with or without having them stated in the statute."

The remaining seven arbitrators indicated that there might be some differences. Two arbitrators felt that if the criteria were not listed in the statute, the total-compensation criterion (that is, wages plus benefits) would receive greater weight, since employers would probably argue this more often (as is the case in the private sector). Three other arbitrators suggested that by listing the criteria, arbitrators are limited from "running wild with their opinions," and protected from "overlooking something that the legislature may consider important." Another arbitrator maintained that experienced arbitrators would not be affected either way, but conceded that inexperienced arbitrators might "go off on their own" if the criteria were not listed. Finally, one arbitrator argued that because the ability-to-pay criterion is not given a great deal of weight under the current situation, it would probably receive little or no emphasis if it were not listed in the statute.

Additional Relevant Factors

Question 8 concluded the interviews by asking the arbitrators if there were any factors that they thought should have been included or excluded from the study to make the cases more realistic. Three general concerns were suggested by the arbitrators.

First, given that the issues in dispute were limited to wages, other non-wage issues (for example, benefits, work rules, and the like) were absent from the study. This is not the situation in many actual cases; and in cases that are limited to wage issues, there is often information regarding the trade-offs made prior to arbitration.

Second, absent a specific ability-to-pay argument, the emphasis given to the criteria normally associated with this issue (TAXR, EXPD, and WORK) could not be adequately tested. As many arbitrators indicated, however, this omission is committed in the majority of actual cases.

Finally, since the wage information dealt with only the current year (although previous-year information could have been calculated from the data), past wage relationships and bargaining history could not be observed. This information was particularly desirable for considering any catch-up situations and parity relationships between police and fire fighter wages.

Conclusion

The goal of these interviews was to provide further insight into how and why arbitrators apply different, and often conflicting, wage criteria in public sector interest arbitration. Even though the results show that individual decision making policies are as diverse as the cases with which

arbitrators are confronted, there are some general observations and conclusions that can be made from this study.

First of all, a comparison of the experimental results and the interview comments suggests some strong similarities between the way arbitrators think they apply the criteria and the way they do apply the criteria on an objective basis. This level of insight could arguably be a function of the experience possessed by this one group of arbitrators. In addition, the comparison shows that the arbitrators give a fair amount of consideration to each individual criterion, although some are given more weight than others. This may have something to do with the arbitrators' experience, as well as their familiarity with the statute and sensitivity toward judicial review of arbitrator awards. It may take an experienced arbitrator to balance the many factors that go into deciding some cases. The arbitrators, in fact, demonstrated relatively advanced decision making skills.

The study demonstrates that the majority of arbitrators tend to lean, at least initially, toward internal wage comparisons based on percent increases. Although this emphasis was conditioned on other factors, the majority seems to appreciate the unique and/or historical circumstances that may exist in a particular community (including the desirability of maintaining such circumstances).

As for ability to pay, some underlying reasons why this criterion appears to play such a secondary role, behind comparability and cost of living. In light of the stressful economic conditions that continually face many state and local governments, one must ask why ability to pay is not a more controlling factor. Whether it is a matter of employers simply not arguing the point[8] or not arguing it competently,[9] it does appear that arbitrators are sensitive to the issue. They clearly indicated that they grant greater, if not decisive, weight to ability to pay when there is a well-supported argument. What may be needed, however, is a clearer expression from arbitrators as to the type of evidence required to prove inability to pay or a more specific definition of this criterion in the arbitration statutes. This may be easier said than done, however, given the difficulty and sensitivity attached to defining ability to pay (remember, "I can't tell you what it is, but I know it when I see it").

Most of the arbitrators believed that the listing of criteria in the statute was not important because they would have otherwise been guided by the "common law" that has developed in interest arbitration. While other arbitrators generally agreed, almost a third of the group indicated that the listing of criteria does have some sort of "controlling effect" on arbitral decision making and also, to some extent, on the parties' final offers.

Finally, the importance of information about the relationship between the parties was stressed once again by all the arbitrators at the conclusion of the interviews. The desire to have this type of information seems to permeate the different decision issues and criteria with which the arbitrators were confronted. This suggests that the arbitrators earnestly view their role in the context of the continuous nature of the parties' relationship, and any major deviations in that relationship have to come from the bilateral process of negotiations, not from the arbitration process.

8. See Dan Fernbach and Paul Jarley, Employer and Employee Experience Under Wisconsin's Mediation-Arbitration Law: F. Role of Mediators-Arbitrators (Madison, WI: Wisconsin Legislative Council Staff Brief 85-8F, August 1985).
9. See Arnold M. Zack, "Ability to Pay in Public Sector Bargaining," in Thomas S. Christensen and Andrea S. Christensen, eds., Proceedings of the New York University Twenty-third Annual Conference on Labor (New York: Matthew Bender and Co., 1970), at 403-426; and Charles C. Mulcahy and Marion C. Smith, Problems and Solutions Resulting from Inability to Pay in the Public Sector (Washington, DC: Public Employee Relations Library, No. 57, International Personnel Management Association, 1978).

Appendix E:

Suggestions on the Sequence of Data Presentation

Once all the data have been collected and analyzed properly, the next step in the collective bargaining process is to prepare the data presentation. The exact order in which data to support the union's demands should be presented to the employer or a third-party neutral is, by and large, a matter of individual preference. Beyond that, the controlling factor must be the data — what they show, or do not show — used in the presentation. Consequently, the sequence of the presentation may vary from one case to the next or, for any one union, from one negotiation to the next.

For example, it is entirely possible that in some collective bargaining situations, the union will emphasize developments that have taken place since the last negotiations. On other occasions, the union may find it advantageous to carry its analysis back over a longer stretch of time. In some negotiations, it may use the Urban Family Budgets, as well as comparisons with other locals; in others, it may not. Furthermore, some presentations may have to be tailored to meet requirements established by State law governing public employee collective bargaining.

In view of all this, the discussion that follows should be considered as only one possible outline of an approach and one that assumes the data in question support the union's position.

1. Particularly during the current period of rapidly rising consumer prices, the union might start out by demonstrating the impact of inflation on the salaries established by the expiring agreement. This would be done to show the extent to which the gains achieved in salary (or standard of living) at the last negotiations have been eroded. Or, the same point may be made with reference to a longer span of time, i.e. over the last five or ten years, or perhaps over the last two or three contracts, etc.
2. The union might next wish to demonstrate that its current salary lags behind the salary of fire fighters in other comparable cities.
3. Next, the union could compare the growth in salaries of fire fighters in other comparable cities.
4. If there are points to be made about hours of work, staffing, alarms, etc. that is, matters of work-load, they could be brought in at this point.
5. The fire fighter salary (with appropriate longevity) may be compared to the Urban Family Budget. If budgets are available for other cities in the universe, the salary-to-budget ratios can be compared to see just how the negotiating city fares in relation to the other cities in the universe. This type of comparison can also be made over a span of time, to see how the salaries have been moving in relation to the changing costs of the budgets since the chosen base year. If the union chooses not to make an inner-city comparison, it can still make a measurement over time simply by comparing the growth in its own salary to the growth in the cost of the budget (either the budget for its own area, or the national budget, or the regional budget, whichever is the most appropriate budget that is available in each case).
6. The union should also look into salary comparisons involving non-fire fighter occupations such as police, sanitation, teachers, building trades, etc., on an annual and/or hourly basis. The union may wish to argue that it is not doing as well as it should be in relation to the rates paid in these occupations within its area. Or it may present arguments pertaining to its relative position; that is, the pay relationships that exist in its city in comparison to the pay relationships that prevail in the other cities of the universe. It can also present these comparisons over some stretch of time in order to demonstrate that its relative position has slipped since the chosen base year.

As was indicated at the outset, some of the data may prove useful and some may not. The union must exercise selectivity with discretion, so that it does not present a case, whether oral or written, that is full of large "holes." It must choose its line of attack, and utilize all of the data and arguments that fit. Each table should have relevance to the union's demand, and the union should state just what each table shows in relation to the demand.

The union should not present data that is useful only if presented in a limited fashion, since this opens the way for the employer to enlarge upon that particular comparison, to the union's disadvantage. It is better to argue the case with fewer points that are fitted together into a tight, cohesive, and logical presentation.

There is one simple rule that is useful to follow in developing a case: Always assume that the people on the other side of the table are smart and as knowledgeable as you are.

The following is an example of the collective bargaining procedure actually implemented by an IAFF local.

SEQUENCE OF EVENTS

- Started contract negotiations by asking the membership for suggestions.
- Compiled suggestions from the membership. The Executive Board developed a survey and asked the membership to rate the importance of each item.
- Took most important items of survey and put them on a"Wish List" with items that could be traded off.
- Presented the proposal to the City. The City responded with a cost factor list.
- Started negotiations.

CONTRACT SURVEY

Please rate the following contract issues according to the following scale:

5 High Priority
4 Very Important
3 Important
2 Priority
1 Low Priority

___ Food allowance;
___ Increase special position pay;
___ Increase in life insurance;
___ City to pay pension cost;
___ IFD required physicals on company time;
___ Full paid health insurance for active fire fighter;
___ Service fee for non-union members;
___ Pay raise;
___ Minimum staffing;
___ Increase vacation rollover to 60 days;
___ Increase in clothing allowance;
___ Full or partial paid health insurance for retired members of Local 416 and participation in Wellness Program;
___ Longevity increase $3,000.00 in 21st year;
___ Sick bank for new hires;
___ Reduction of hours;

If you have any ideas or comments on the above issues or any items you feel should be included in Contract Negotiations, please make these comments in the space provided on the back of this survey. If additional space is needed, please attach additional sheet.

If you have any questions, please call any member of the Executive Board for clarification. Upon completion of this survey, please fold and staple or tape the survey closed so that the address of the Union Hall is on the outside and mail as soon as possible.

UNION PROPOSAL

1. Fair share fee.
2. Time off for Union business.
3. Two Year Contract.
4. Ten percent raise the first year and ten percent raise the second year.
5. Full paid insurance for active fire fighters.
6. Full paid insurance for retired fire fighters.
7. Staffing of equipment.
8. Reduce work week to 48 hours.
9. City pay pension assessment 6%.
10. Longevity pay raise of $3,000 in Twenty-first year.
11. Increase life insurance to $100,000.
12. Physicals and PFE to be performed on duty time.
13. Establish sick bank for those hired after January 1, 1989.
14. Increase special position pay $250.00 each year and be able to receive hazardous duty pay also.
15. Money for house work, $100.00 per hour.
16. Increase new hire vacations to same.
17. New hire sick time to be raised from 8 hours to 12 hours.

18. PA day every four months.
19. EMT coat.
20. Increase rollover days to 60 and be able to rollover PA days.
21. List paid holidays in contract.
22. Everyone scheduled to work a holiday be paid an additional $100.00 per day the first year, and $150.00 on the second year. This would cover people on vacation and PA days and line-of-duty injury plus twenty-year day.
23. Grievance procedure in contract.
24. Spell out compensation time.
25. Spell out how you accumulate vacation time (twenty-year day).
26. City pay cost of fire related education.
27. City pay cost of any fire gear damaged in line-of-duty accidents causing personal injury.
28. Union have input into safety committee.
29. Be able to cash in accumulated sick time over 960 hours.
30. Defining a disciplinary charge of "conduct unbecoming."
31. Maternity leave policy.
32. Rescue Technician with a module system. Each module to be paid $200.00 for a total of six modules.
33. Extra pay for Field Training Officer.
34. Ride out pay per hour.
35. Rights of employees.
36. City to set aside $20,000 for furniture in fire houses annually.
37. Accumulated sick time to show on check stubs as well as rollover days.
38. Sick policy while on vacation.
39. Discuss going to quartermaster system.
40. Posting procedure.

Salary: Nothing in this Agreement should be construed as including compensation for any overtime hours worked pursuant to the hourly standards set forth under Section 7 of the Fair Labor Standards Act.

SUMMARY OF 1993 CONTRACT

These are the items that were negotiated into the new contract.

1. Length of Contract: four years.
2. 1993—3.06% = $1,080 3rd year fire fighter.
   1994—4.09% = $1,523 3rd year fire fighter.
   1995—5.45% = $1,771 3rd year fire fighter.
   1996—5.46% = $1,877 3rd year fire fighter.
3. EMT pay goes to $500 annually January 1, 1995. $750 annually January 1, 1996.

   Stacking of Special Position Pay goes into effect January 1, 1996. There will be ten categories and potential extra earnings of $1,725.
4. FLSA - Overtime - OT will now be paid correctly starting January 1st. Additional day off during year. Vacation schedule will change some. Still by seniority.
5. 97% of single insurance paid. 80% of family insurance paid.
6. Staffing clause.
7. Physicals and PFE's to be performed on duty time.
8. Money for house work performed on duty.
9. Paid holidays listed in contract.
10. Holiday pay increase to $85 in 1994, $90 in 1995, $95 in 1996.
11. Grievance procedure (spelled out).
12. Non suppression personnel compensation time spelled out.
13. Time off for fire-related education spelled out.
14. City to replace fire gear severely damaged on fires.
15. Union representation on safety committee.
16. Defining disciplinary charges of "conduct unbecoming."
17. Employee "Bill of Rights," due process in disciplinary process.
18. Maternity leave policy—will be by General Order.
19. Accumulated sick and vacation time to show on sheet to be sent out from office every six months.
20. Posting procedure in writing.
21. Bank of hours to be used by union president or his designee.
22. LOD injuries while off to get holiday pay.
23. Between all ranks, there will be parity in the base pay with IPD officers which will include the present policy on engineers.

Appendix F:
Sample Bureau of Labor Statistics News Releases and Reports

News United States Department of Labor

Bureau of Labor Statistics Washington, D.C. 20212

FOR TECHNICAL INFORMATION:
Patrick C. Jackman (202) 606-7000
CPI QUICKLINE: (202) 606-6994
FOR CURRENT AND HISTORICAL
INFORMATION: (202) 606-7828
MEDIA CONTACT: (202) 606-5902
INTERNET ADDRESS: http://stats.bls.gov/cpihome.htm

USDL-98-491
TRANSMISSION OF
MATERIAL IN THIS
RELEASE IS EMBARGOED
UNTIL 8:30 A.M. (EST)
Tuesday, December 15, 1998

CONSUMER PRICE INDEX: NOVEMBER 1998

The Consumer Price Index for All Urban Consumers (CPI-U) was unchanged in November, before seasonal adjustment, remaining at a level of 164.0 (1982-84=100), the Bureau of Labor Statistics of the U.S. Department of Labor reported today. For the 12-month period ended in November, the CPI-U has increased 1.5 percent.

The Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W) rose 0.1 percent in November, prior to seasonal adjustment. The November 1998 CPI-W level of 160.7 was 1.4 percent higher than the index in November 1997.

CPI for All Urban Consumers (CPI-U)

On a seasonally adjusted basis, the CPI-U rose 0.2 percent in November, the same as in October. The indexes for food and energy, which had accelerated in October, moderated in November. The food index increased 0.1 percent in November after advancing 0.6 percent in October. The index for food at home, which increased 0.7 percent in October, rose 0.2 percent in November; the moderation was a result of downturns in the indexes for fruits and vegetables and for meats, poultry, fish, and eggs. The energy index, which rose 0.9 percent in October, was unchanged in November. The index for petroleum-based energy declined 1.0 percent, while the index for energy services increased 0.8 percent. Excluding food and energy, the CPI-U increased 0.2 percent in November, the same as in each of the preceding four months.

Table A. **Percent changes in CPI for Urban Consumers (CPI-U)**

Expenditure Category	Seasonally adjusted							Compound annual rate 3-mos. ended Nov. '98	Un-adjusted 12-mos. ended Nov. '98
	Changes from preceding month								
	1998								
	May	June	July	Aug.	Sep.	Oct.	Nov.		
All Items	.3	.1	.2	.2	.0	.2	.2	1.7	1.5
Food and beverages	.5	.1	.2	.3	.0	.5	.2	2.7	2.3
Housing	.3	.1	.2	.1	.2	.2	.3	3.0	2.3
Apparel	.4	.2	-.3	1.1	-.7	.1	.0	-2.7	.2
Transportation	.1	-.3	.3	.0	-.4	.3	.0	-.6	-1.7
Medical care	.3	.4	.2	.4	.3	.2	.2	2.7	3.5
Recreation	.0	.1	.0	.1	.1	-.3	.2	.0	1.3
Education and communication	.3	.1	.0	-.5	.0	.2	.2	1.6	1.0
Other goods and services	.7	.0	.7	.1	.9	.3	-.3	3.9	4.6
Special Indexes									
Energy	.3	-.7	.0	-1.0	-1.3	.9	.0	-1.6	-9.2
Food	.6	.1	.2	.2	.0	.6	.1	2.8	2.3
All Items less food and energy	.2	.1	.2	.2	.2	.2	.2	2.1	2.3

As previously announced, effective with release of data for January 1999, the BLS will introduce a new formula for calculating the basic components of the CPI. See page 4 for more details. See pages 5-9 for announcements of other methodological changes to be introduced with data for January 1999.

During the first 11 months of 1998, the CPI-U rose at a 1.6-percent seasonally adjusted annual rate (SAAR). This compares with an increase of 1.7 percent for all of 1997. Energy costs have continued to act as a moderating influence on overall consumer price index movements thus far in 1998, decreasing at an 8.2-percent annual rate after declining 3.4 percent in all of 1997. Food costs, which rose 1.5 percent in 1997, have risen at a 2.5-percent SAAR in the first 11 months of 1998. Excluding food and energy, the CPI-U has advanced at a 2.4-percent rate thus far in 1998, compared with a 2.2 percent rise for all of 1997.

The food and beverages index rose 0.2 percent in November. The index for food at home, which increased 0.7 percent in October, rose 0.2 percent in November; the moderation was a result of downturns in the indexes for fruits and vegetables and for meats, poultry, fish, and eggs. The index for fruits and vegetables declined 0.9 percent in November, following a 3.2 percent increase in October. In November, the index for fresh vegetables fell 3.0 percent, more than offsetting a 1.1 percent rise in the index for fresh fruits. (Prior to seasonal adjustment, prices for fresh vegetables increased 0.5 percent, while fresh fruit prices fell 0.9 percent.) The index for processed fruits and vegetables declined for the third consecutive month--down 0.6 percent in November. The index for meats, poultry, fish, and eggs declined 0.2 percent, following a 0.2 percent rise in October. A downturn in the indexes for poultry and for eggs was responsible for the November decline. Meat prices rose slightly in November; increases in prices for beef and other meats more than offset another decline in pork prices. The index for dairy products continued to advance, but by less than in recent months--up 0.6 percent in November, following increases of about 1.5 percent in each of the preceding three months. The indexes for the other three major grocery store food groups, cereal and bakery products, nonalcoholic beverages, and other food at home, rose 0.2, 0.5, and 0.7 percent, respectively. The other two components of the food and beverage index--food away from home and alcoholic beverages--each rose 0.2 percent.

The housing component rose 0.3 percent in November. Shelter costs rose 0.3 percent, following an increase of 0.2 percent in October. Within shelter, the indexes for rent and for owners' equivalent rent each rose 0.2 percent, and the cost of lodging away from home increased 1.3 percent. (Prior to seasonal adjustment, the cost of lodging while out of town fell 2.9 percent.) The index for fuels and utilities increased 0.6 percent in November, its first advance since May. The indexes for natural gas and for electricity rose 2.2 and 0.4 percent, respectively, more than offsetting a 0.7 percent decline in the index for fuel oil. (Prior to seasonal adjustment, charges for electricity fell 1.9 percent, reflecting the switch to off-season rates in some areas.) The index for household furnishings and operations increased 0.2 percent in November, the same as in October.

The transportation component, which increased 0.3 percent in October, was unchanged in November. The November moderation reflects a return to the general pattern in 1998 of declining gasoline prices. Following an increase of 2.7 percent in October, the index for gasoline fell 0.9 percent in November. (Prior to seasonal adjustment, gasoline prices declined 1.2 percent.) Gasoline prices have fallen 11.9 percent thus far in 1998 and are 24.9 percent lower than their peak level in November 1990. The index for new and used vehicle prices rose 0.2 percent in November. The index for new vehicles was unchanged. (Prior to seasonal adjustment, new vehicle prices rose 0.7 percent. As of November, about 55 percent of the new vehicle sample was represented by 1999 models. The 1999 models will continue to be phased in, with appropriate adjustments for quality change, over the next several months as they replace old models at dealerships. For a report on quality changes for the 1999 vehicles represented in the Producer Price Index sample, see news release USDL-98-457, dated November 13, 1998.) The index for used cars and trucks increased 0.7 percent. Public transportation costs declined for the third month in a row, down 0.5 percent in November, reflecting a 2.1 percent drop in airline fares.

The index for apparel was unchanged in November, following a 0.1 percent rise in October. (Prior to seasonal adjustment, apparel prices declined 0.4 percent, largely reflecting the discounting of prices for women's wear.)

Medical care costs rose 0.2 percent in November to a level 3.5 percent above a year ago. The index for medical care commodities--prescription drugs, nonprescription drugs, and medical supplies--increased 0.2 percent. The index for medical care services also rose 0.2 percent, with charges for professional services and for hospital and related services each up 0.2 percent.

The index for recreation costs, which declined 0.3 percent in October, rose 0.2 percent in November. Continued declines in prices for video and audio equipment and for toys were offset by increases in prices for pets, pet products and services, sporting goods, club memberships, and admissions to movies, theaters, concerts and sporting events.

The index for education and communication rose 0.2 percent in November, the same as in October. The index for telephone services rose 0.4 percent. The index for information and information processing other than telephone services declined 2.2 percent, reflecting a 2.8 percent drop in the index for personal computers and peripheral equipment. The latter index has declined 34.4 percent thus far in 1998.

The index for other goods and services declined 0.3 percent in November, following an increase of 0.3 percent in October. The downturn largely was attributable to a decrease in the index for tobacco and smoking products, which fell 1.1 percent in November after increasing 0.3 percent in October. For the 12 months ended in November, however, the index for tobacco and smoking products has risen 12.2 percent.

CPI for Urban Wage Earners and Clerical Workers (CPI-W)

On a seasonally adjusted basis, the CPI for Urban Wage Earners and Clerical Workers increased 0.1 percent in November.

Table B. **Percent changes in CPI for Urban Wage Earners and Clerical Workers (CPI-W)**

Expenditure Category	Seasonally adjusted								Un-adjusted
	Changes from preceding month							Compound annual rate	12-mos.
	1998							3-mos. ended	ended
	May	June	July	Aug.	Sep.	Oct.	Nov.	Nov.'98	Nov. '98
All Items	.3	.1	.2	.1	.1	.3	.1	2.0	1.4
Food and beverages	.6	.1	.3	.2	.0	.5	.2	2.8	2.1
Housing	.3	.1	.2	.1	.2	.2	.3	2.8	2.1
Apparel	.3	.3	-.4	.9	-.5	.4	.1	.0	.3
Transportation	.1	-.1	.2	-.1	-.4	.4	.0	.0	-1.7
Medical care	.3	.5	.2	.3	.3	.2	.2	2.8	3.5
Recreation	-.2	.1	-.1	.2	.0	-.3	.1	-.8	.8
Education and communication	.4	.1	.1	-.5	.1	.1	.3	2.0	1.2
Other goods and services	.8	-.1	.9	.2	1.3	.3	-.5	4.5	5.5
Special Indexes									
Energy	.3	-.6	-.1	-1.1	-1.4	1.0	-.1	-2.0	-9.5
Food	.6	.1	.3	.3	-.1	.5	.2	2.5	2.2
All Items less food and energy	.2	.1	.2	.2	.2	.2	.2	2.1	2.3

Consumer Price Index data for December are scheduled for release on Thursday, January 14, 1999, at 8:30 A.M. (EST).

Releases for the remainder of 1999:

Feb.19	Aug. 17
Mar.18	Sep. 15
Apr. 13	Oct. 19
May 14	Nov. 17
June 16	Dec. 14
July 15	Jan. 14, 2000

Planned Change in the Consumer Price Index Formula

On April 16, the Bureau of Labor Statistics announced its decision to use a new formula for calculating the basic components of the Consumer Price Index for all Urban Consumers (CPI-U) and the Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W). This change will become effective with data for January 1999.

The new formula, the geometric mean estimator, will be used in index categories that comprise approximately 61 percent of total consumer spending represented by the CPI-U. The remaining index categories, which are shown in the table below, will continue to be calculated as they are currently. Based upon BLS research, it is expected that planned use of the new formula will reduce the annual rate of increase in the CPI by approximately 0.2 percentage point per year.

The geometric mean estimator will be introduced in both the CPI-U and the CPI-W effective with data for January 1999, in accord with the past practice of introducing methodological changes at the beginning of a calendar year. BLS will continue to publish "overlap" CPI-U and CPI-W series using the current calculation method for the first six months of 1999. These indexes will not be published regularly for months subsequent to June 1999, but will be available upon request.

Additional information on this change will be published in the April 1998 CPI Detailed Report and is available on the Internet (http://stats.bls.gov/cpihome.htm). This information may also be obtained by writing to the Bureau of Labor Statistics, Division of Consumer Prices and Price Indexes, 2 Massachusetts Ave. N.E., Room 3615 Washington, D.C. 20212 or by calling (202) 606-7000.

Arithmetic Mean (Laspeyres) Formula

1. Selected shelter services:

A) Rent of primary residence	B) Owners' equivalent rent of primary residence	C) Housing at school, excluding board

2. Selected utilities and government charges:

A) Electricity	C) Residential water and sewerage maintenance	E) Telephone services, local charges
B) Utility natural gas service	D) State and local registration, license, and motor vehicle property tax	F) Cable television

3. Selected medical care services:

A) Physicians' services	C) Eyeglasses and eye care	E) Hospital services
B) Dental services	D) Services by other medical professionals	F) Nursing homes and Adult daycare

Changing the Treatment of Mandated Pollution Control Measures in the Consumer Price Index

Beginning in 1999, modifications to goods and services made solely for purposes of meeting air pollution standards, and that do not otherwise provide direct value to consumers, will no longer be treated as quality improvements in the Consumer Price Index (CPI). Price increases associated with such modifications will be reflected as increases in the index.

The Bureau of Labor Statistics (BLS) recently undertook to explain more precisely the relationship between the CPI and a complete measure of changes in consumers' living costs. As part of this activity the BLS reviewed the treatment of pollution control measures in the CPI. The new policy for treating pollution control measures is a direct result of that review.

BLS has stated that the proper objective of the CPI is to approximate changes in the cost of living of U.S. consumers[1]. The CPI is intended to approximate a particular subindex of a complete cost-of-living index, a subindex that is limited to prices of market goods and services and is conditional upon the levels of other determinants of changes in living costs, such as the environment, crime level, and numerous government-provided goods and services. The choice of this index definition recognizes that not all important living cost determinants can be reliably measured and also provides users of the CPI with a clear specification of its scope and limitations.

Given the current definition, changes in air quality, as well as in other important environmental factors, are beyond the scope of the CPI and thus properly cannot be included in its construction. A more complete explanation of the relationship between the CPI and a comprehensive measure of changes in living costs is contained in "The Treatment of Mandated Pollution Control Measures in the CPI."[2]

The new policy for the treatment of air pollution measures will become effective with CPI data for January 1999. The new practice will have its most significant effect on the motor fuel and new and used motor vehicle components of the index. In the vehicle indexes, the policy will apply to all vehicle models introduced on or after January 1, 1999. Since most of the 1999 model-year vehicles will be introduced before that date, the old practice will be used for the 1998-to-1999 model-year changeover in most cases.

Historically, quality adjustments for anti-pollution measures have been made to the new car (or new vehicle) component of the CPI since 1969 (automobile model year 1970), with their estimated dollar effect published annually. Since 1988, these data have also been utilized to make quality adjustments in the used car component. In addition, beginning in late 1994, quality adjustments were made for the introduction of reformulated gasoline, which was required in selected areas for compliance with the Clean Air Act Amendment of 1990. Available information is not sufficient to make possible a complete accounting of the impacts of this policy in all years. The estimates presented below should be viewed, therefore, as approximations rather than as precise values. In adherence with standard policy, the official CPI historical data will not be revised to be consistent with the new practice. For the period from December 1968 through December 1997, the new car

Improvements to CPI Procedures for Handling Refunds for Utilities

Effective with the calculation of the index for January 1999, the Consumer Price Index (CPI) will change its treatment of refunds for electricity, natural gas, or other utility services when the refunds are based on earlier periods' utility consumption amounts. The change will affect both the price indexes and the average prices computed by the CPI program.

Under the current practice, the CPI utility indexes reflect refunds that appear on current period bills but that are based on past period utility consumption. Generally these refunds result from the rollback of temporary rate increases, lower than anticipated energy costs, or a reevaluation of rates with respect to actual costs. The current practice makes these indexes rather volatile and do not reflect the actual current price (for example, what a new customer would pay) for a utility service such as electricity.

Under the new procedure, the CPI will disregard any **refund for past excess charges** when it appears on residential customer bills as a **separate refund credit** that is subtracted from the charges for current billing period's usage. The movement of the CPI utility indexes will reflect all changes in rates—generally in the month they are effective. The CPI utility indexes will continue to reflect current period credits that are based on current period consumption, such as those associated with purchased gas or fuel adjustments.

For additional information on this change, write to the Bureau of Labor Statistics, Division of Consumer Prices and Price Indexes, 2 Massachusetts Ave. NE, Room 3615, Washington, DC 20212-0001; or telephone Bob Adkins at (202) 606-6985 ext. 264, or send e-mail to Adkins_B@bls.gov

component of the CPI-U rose 174.2 percent. BLS estimates that not adjusting for anti-pollution measures would have resulted in an increase of 230.2 percent over this period. Quality adjustments for light trucks have been made since they were introduced into the CPI in 1983. For the period from December 1983 through December 1997, this index rose 51.4 percent, but with the quality adjustments for anti-pollution measures factored back into the index, it would have risen by an estimated 55.1 percent in this period. The CPI used car index rose 27.2 percent between December 1987 and December 1997; with the quality adjustments for anti-pollution measures factored back into the index, it would have risen approximately 28.8 percent in that 10-year period. The motor fuel component, whose index rose 7.5 percent between December 1993 and December 1997, would have increased by an estimated 15.4 percent over that period if adjustment for environmental quality change had not been made. BLS estimates that the aggregate effect of these component changes on the CPI-U All Items index would have increased the percentage change over the period from December 1968 to December 1997 from 354.4 percent to 357.7 percent. Past experience, however, is not necessarily an indicator of the future impact of this policy change.

For additional information on these changes, write to
Bureau of Labor Statistics
Division of Consumer Prices and Price Indexes
2 Massachusetts Ave. NE, Room 3130
Washington, DC 20212

or send e-mail to Jackman_P@bls.gov, or telephone Patrick Jackman at (202) 606-6950, or obtain the information on the internet at: http://stats.bls.gov/cpihome.htm .

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[1] "Measurement Issues in the Consumer Price Index," paper prepared in response to a letter from Representative Jim Saxton, Chairman of the Joint Economic Committee, June 1997. Paper available by contacting BLS or on the internet at: http://stats.bls.gov/cpihome.htm

[i2] Paper available by contacting BLS or on the internet at: http://stats.bls.gov/cpihome.htm

Using a hedonic model to adjust television prices in the Consumer Price Index for changes in quality

Effective with the release of the Consumer Price Index (CPI) for January 1999, the Bureau of Labor Statistics (BLS) will introduce an improvement in the way in which it calculates the Television stratum of the CPI.

As of December 1997, Televisions constituted 0.215 percent in the Consumer Price Index for all Urban Consumers (the CPI-U) and 0.256 percent in the Consumer Price Index for Urban Wage Earners and Clerical Workers (the CPI-W).

Bureau of Labor Statistics researchers developed a regression procedure, called a hedonic model, that decomposes the price of television sets into implicit prices for each important feature and component[1]. This model uses Television observations collected for the CPI and provides an estimate of the value of each of the significant features and components of the sets for which prices are collected. This yields a mechanism for replacing obsolete televisions in the CPI sample with current ones, allowing the CPI to capture the price change that may occur as new models replace old ones in the market place without counting the value of quality improvements as price increases.

The CPI has used similar hedonic methods to adjust apparel prices for many years. In January 1998, the CPI began using a similar approach for Personal Computers. In the coming years, BLS plans to extend the method to additional CPI items.

Starting with the CPI for January 1999, when a television model in the CPI sample improves in some way, the value of that change, as derived from the regression estimates, will be deducted from the observed price change for that product. (Conversely, if a model deteriorates, the value of the difference will be added to the price.)

For additional information on these changes, write to
Bureau of Labor Statistics
Division of Consumer Prices and Price Indexes
2 Massachusetts Ave. NE, Room 3260
Washington, DC 20212-0001
or telephone Tim LaFleur at (202) 606-6982 ext. 253,
or send e-mail to LaFleur_T@bls.gov

[1] Brent R. Moulton, Timothy J. LaFleur, and Karin E. Moses, "Research on Improved Quality Adjustment in the CPI: The Case of Televisions," presented to the Conference of the Ottawa Group, April 1998.

Revision of the CPI Housing Sample and Estimation Process

BLS will implement the housing portion of the ongoing CPI revision process beginning with the index for January 1999. This part of the CPI revision is directed at the major shelter indexes, "rent of primary residence" and "owners' equivalent rent of primary residence." The CPI will shift to an improved estimation method for homeowner shelter costs and will use a new housing unit sample based on the 1990 decennial census.

The new estimator for "owners' equivalent rent of primary residence" will employ the same rental observations that form the basis of the revised "rent of primary residence" index. Those observations will be weighted to reflect the total urban stock of owner-occupied and renter-occupied housing, respectively. The current CPI estimates the change in the implicit rents of a sample of owner-occupied units from the rent change of rental units matched specifically to them. Among other advantages, the new method will not require selection of an owner-occupied sample.

The new sample will provide a current set of rental housing units that, as noted above, will be the basis of both the "rent of primary residence" and "owners' equivalent rent of primary residence" indexes. The decennial census provided information that BLS has used to select small geographic areas (called segments) within the CPI's 87 pricing areas that represent the urban United States. The segment selection process utilizes random sampling so that the housing sample will represent all varieties and locations of the housing stock throughout each CPI pricing area. Segments have been selected for the initial sample. Augmentation segments also will be supplied to replenish the current sample. The CPI will use another sample augmentation process to bring housing units constructed since the decennial census into the CPI housing sample.

Additional information on these and other changes to the housing component of the CPI can be found in the December 1996 *Monthly Labor Review* article, "Revision of the CPI Housing Sample and Estimators." For additional information, write to the Bureau of Labor Statistics, Division of Consumer Prices and Price Indexes, 2 Massachusetts Ave., NE, Room 3615, Washington, DC 20212-0001 or telephone Frank Ptacek at 202-606-6991 ext. 278, or send e-mail to Ptacek_F@bls.gov

BLS to Maintain Current Reference Base of 1982-84=100 for most CPI index series

The Bureau of Labor Statistics (BLS) previously indicated its intention to change the numerical reference base for both the Consumer Price Index for All Urban Consumers (CPI-U) and the Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W) from their present 1982-84=100 base to a 1993-95=100 base, effective with release of the January 1999 index in February 1999. BLS also indicated that the alternate, or 1967=100 base, would be discontinued in 1999 as well. This plan was initially described in the December 1996 Monthly Labor Review, a publication which contained several articles that dealt with the 1998 CPI Revision.

The BLS has now decided not to implement this rebasing plan. Instead, the BLS will maintain the reference base of 1982-84=100 used for most items. In addition, the 1967=100 reference base will continue to be the alternate base for the All Items indexes. This decision is based in part on the fact that historical data have less precision after rebasing. Rebasing is simply an arithmetic transformation that does not substantially impact the index. Because the rebased index values are smaller, however, the loss of precision due to rounding is more serious. In addition, retaining the old index reference bases would spare users the inconvenience associated with conversion.

Changes in the numerical reference base should not be confused with the updating of the CPI's the market basket. With release of the January CPI in February 1998, the expenditure weights applied to CPI categories are based on consumer spending patterns for 1993-95.

Facilities for Sensory Impaired

Information from this release will be made available to sensory impaired individuals upon request. Voice phone: 202-606-7828, Telecommunications Device for the Deaf (TDD) phone: 202-606-5897, TDD Message Referral Phone Number: 1-800-326-2577.

Brief Explanation of the CPI

The Consumer Price Index (CPI) is a measure of the average change in prices over time in a fixed market basket of goods and services. The Bureau of Labor Statistics publishes CPIs for two population groups: (1) a CPI for All Urban Consumers (CPI-U) which covers approximately 87 percent of the total population and (2) a CPI for Urban Wage Earners and Clerical Workers (CPI-W) which covers 32 percent of the total population. The CPI-U includes, in addition to wage earners and clerical workers, groups such as professional, managerial, and technical workers, the self-employed, short-term workers, the unemployed, and retirees and others not in the labor force.

The CPI is based on prices of food, clothing, shelter, and fuels, transportation fares, charges for doctors' and dentists' services, drugs, and other goods and services that people buy for day-to-day living. Prices are collected in 87 urban areas across the country from about 50,000 housing units and approximately 23,000 retail establishments-department stores, supermarkets, hospitals, filling stations, and other types of stores and service establishments. All taxes directly associated with the purchase and use of items are included in the index. Prices of fuels and a few other items are obtained every month in all 87 locations. Prices of most other commodities and services are collected every month in the three largest geographic areas and every other month in other areas. Prices of most goods and services are obtained by personal visits or telephone calls of the Bureau's trained representatives.

In calculating the index, price changes for the various items in each location are averaged together with weights which represent their importance in the spending of the appropriate population group. Local data are then combined to obtain a U.S. city average. Separate indexes are also published by size of city, by region of the country, for cross-classifications of regions and population-size classes, and for 26 local areas. Area indexes do not measure differences in the level of prices among cities, they only measure the average change in prices for each area since the base period.

The index measures price change from a designed reference date—1982-84 which equals 100.0. An increase of 16.5 percent, for example, is shown as 116.5. This change can also be expressed in dollars as follows: the price of a base period market basket of goods and services in the CPI has risen from $10 in 1982-84 to $11.65.

For further details see BLS Handbook of Methods, Chapter 17, the Consumer Price Index, Bulletin 2490, April 1997 and visit CPI home page on the Internet at http://stats.bls.gov/cpihome.htm or contact our CPI Information and Analysis Section on (202) 606-7000.

Calculating Index Changes

Movements of the indexes from one month to another are usually expressed as percent changes rather than changes in index points, because index point changes are affected by the level of the index in relation to its base period while percent changes are not. The example below illustrates the computation of index point and percent changes.

Percent changes for 3-month and 6-month periods are expressed as annual rates and are computed according to the standard formula for compound growth rates. These data indicate what the percent change would be if the current rate were maintained for a 12-month period.

Index Point Change

CPI	115.7
Less Previous index	111.2
Equals index point change	4.5

Percent Change

Index point difference	4.5
Divided by the previous index	111.2
Equals	0.040
Results multiplied by one hundred	0.040x100
Equals percent change	4.0

A Note on Seasonally Adjusted and Unadjusted Data

Because price data are used for different purposes by different groups, the Bureau of Labor Statistics publishes seasonally adjusted as well as unadjusted changes each month.

For analyzing general price trends in the economy, seasonally adjusted changes are usually preferred since they eliminate the effect of changes that normally occur at the same time and in about the same magnitude every year--such as price movements resulting from changing climatic conditions, production cycles, model changeovers, holidays, and sales.

The unadjusted data are of primary interest to consumers concerned about the prices they actually pay. Unadjusted data also are used extensively for escalation purposes. Many collective bargaining contract agreements and pension plans, for example, tie compensation changes to the Consumer Price Index unadjusted for seasonal variation.

Seasonal factors used in computing the seasonally adjusted indexes are derived by the X-12-ARIMA Seasonal Adjustment Method. The updated seasonal data at the end of 1977 replaced data from 1967 through 1977. Subsequent annual updates have replaced 5 years of seasonal data, e.g., data from 1993 through 1997 were replaced at the end of 1997. The seasonal movement of all items and 54 other aggregations is derived by combining the seasonal movement of 73 selected components. Each year the seasonal status of every series is reevaluated based upon certain statistical criteria. If any of the 73 components change their seasonal adjustment status from seasonally adjusted to not seasonally adjusted, not seasonally adjusted data will be used for the last 5 years, but the seasonally adjusted indexes will be used before that period.

Seasonally adjusted data, including the All items index levels, are subject to revision for up to five years after their original release. For this reason, BLS advises against the use of these data in escalation agreements.

Effective with the calculation of the seasonal factors for 1990, the Bureau of Labor Statistics has used an enhanced seasonal adjustment procedure called Intervention Analysis Seasonal Adjustment for some CPI series. Intervention Analysis Seasonal Adjustment allows for better estimates of seasonally adjusted data. Extreme values and/or sharp movements which might distort the seasonal pattern are estimated and removed from the data prior to calculation of seasonal factors. Beginning with the calculation of seasonal factors for 1996, X-12-ARIMA software was used for Intervention Analysis Seasonal Adjustment.

For the fuel oil and the motor fuels indexes, this procedure was used to offset the effects that extreme price volatility would otherwise have had on the estimates of seasonally adjusted data for those series. For some women's apparel indexes and the girls' apparel index, the procedure was used to offset the effects of changes in pricing methodology. For the tobacco and smoking products index, this procedure was used to offset the effects of increases in excise taxes and wholesale tobacco prices. For some alcoholic beverage series, Intervention Analysis Seasonal Adjustment was used to offset the effects of excise tax increases. For the Nonalcoholic beverages index, the procedure was used to offset the effects of a large increase in coffee prices due to adverse weather. For the Water and sewerage maintenance index, the procedure was used to account for a data collection anomaly.

A description of Intervention Analysis Seasonal Adjustment, as well as a list of unusual events modeled and seasonal factors for these items may be obtained by writing the Bureau of Labor Statistics, Division of Consumer Prices and Price Indexes, Washington, DC 20212 or by calling Claire McAnaw Gallagher on (202) 606-6968.

Table 1. Consumer Price Index for All Urban Consumers (CPI-U): U.S. city average, by expenditure category and commodity and service group

(1982-84=100, unless otherwise noted)

CPI-U

Expenditure category	Relative importance, December 1997	Unadjusted indexes		Unadjusted percent change to Nov. 1998 from—		Seasonally adjusted percent change from—		
		Oct. 1998	Nov. 1998	Nov. 1997	Oct. 1998	Aug. to Sep.	Sep. to Oct.	Oct. to Nov.
All items	100.000	164.0	164.0	1.5	0.0	0.0	0.2	0.2
All items (1967=100)	-	491.3	491.3	-	-	-	-	-
Food and beverages	16.310	162.4	162.5	2.3	.1	.0	.5	.2
Food	15.326	162.0	162.1	2.3	.1	.0	.6	.1
Food at home	9.646	162.5	162.5	2.1	.0	-.2	.7	.2
Cereals and bakery products	1.536	182.2	182.1	2.3	-.1	.0	.2	.2
Meats, poultry, fish, and eggs	2.629	148.0	147.9	-.9	-.1	-.7	.2	-.2
Dairy and related products [1]	1.037	155.0	155.9	6.1	.6	1.6	1.4	.6
Fruits and vegetables	1.394	199.5	198.8	4.9	-.4	-2.0	3.2	-.9
Nonalcoholic beverages and beverage materials	1.077	132.6	132.7	-1.5	.1	.0	.4	.5
Other food at home	1.972	152.7	152.7	3.4	.0	.3	.1	.7
Sugar and sweets	.377	150.5	149.6	1.5	-.6	.3	-.1	.3
Fats and oils	.291	156.8	155.1	10.5	-1.1	1.9	2.6	-.3
Other foods	1.305	166.0	166.7	3.2	.4	-.1	-.4	1.1
Other miscellaneous foods [1 2]	.309	103.5	104.8	-	1.3	.1	-.1	1.3
Food away from home [1]	5.680	162.3	162.6	2.5	.2	.4	.1	.2
Other food away from home [1 2]	.172	102.7	103.3	-	.6	.4	.0	.6
Alcoholic beverages	.983	166.6	166.8	1.9	.1	.4	.1	.2
Housing	39.560	161.4	161.3	2.3	-.1	.2	.2	.3
Shelter	29.788	183.9	184.0	3.5	.1	.5	.2	.3
Rent of primary residence	6.885	173.9	174.5	3.4	.3	.3	.3	.2
Lodging away from home [2]	2.327	109.5	106.3	-	-2.9	2.8	-.3	1.3
Owners' equivalent rent of primary residence [3]	20.199	189.8	190.3	3.3	.3	.3	.3	.2
Tenants' and household insurance [1 2]	.377	99.7	99.9	-	.2	.0	.5	.2
Fuels and utilities	4.942	127.1	126.5	-3.5	-.5	-.6	-.2	.6
Fuels	4.018	112.0	111.4	-5.4	-.5	-.8	-.4	.8
Fuel oil and other fuels	.261	86.4	86.8	-10.1	.5	-1.7	-.8	.9
Gas (piped) and electricity	3.757	119.6	118.9	-5.1	-.6	-.8	-.3	.8
Household furnishings and operations	4.831	126.6	126.6	1.1	.0	-.3	.2	.2
Apparel	4.944	135.6	135.0	.2	-.4	-.7	.1	.0
Men's and boys' apparel	1.390	134.1	134.1	.8	.0	-1.3	1.2	-.2
Women's and girls' apparel	1.990	128.8	127.5	-1.0	-1.0	-.5	-1.5	-.5
Infants' and toddlers' apparel [1]	.268	130.2	131.3	4.2	.8	.4	4.2	.8
Footwear	.895	130.3	130.4	.9	.1	-.4	-.2	.8
Transportation	17.578	141.3	141.5	-1.7	.1	-.4	.3	.0
Private transportation	16.240	137.7	138.0	-1.8	.2	-.3	.4	.0
New and used motor vehicles [2]	7.899	100.1	100.7	.8	.6	.1	-.1	.2
New vehicles	5.063	142.5	143.5	-.3	.7	-.1	-.3	.0
Used cars and trucks [1]	1.880	153.0	154.0	4.3	.7	.5	.7	.7
Motor fuel	2.995	90.8	89.7	-14.2	-1.2	-2.0	2.6	-1.0
Gasoline (all types)	2.976	90.3	89.2	-14.3	-1.2	-2.0	2.7	-.9
Motor vehicle parts and equipment	.560	101.4	101.4	-.2	.0	.0	.2	-.2
Motor vehicle maintenance and repair	1.603	169.0	169.5	3.4	.3	.5	.4	.5
Public transportation	1.338	189.9	187.4	.8	-1.3	-1.6	-1.3	-.5
Medical care	5.614	244.3	244.7	3.5	.2	.3	.2	.2
Medical care commodities	1.222	224.2	224.5	4.0	.1	.6	.1	.2
Medical care services	4.392	249.0	249.3	3.4	.1	.2	.2	.2
Professional services	2.808	224.2	224.4	3.4	.1	.3	.2	.2
Hospital and related services	1.334	290.2	290.8	3.4	.2	.0	.3	.2
Recreation [2]	6.145	101.1	101.3	1.3	.2	.1	-.3	.2
Video and audio [1 2]	1.763	101.1	100.8	.5	-.3	.2	-.3	-.3
Education and communication [2]	5.528	101.0	101.0	1.0	.0	.0	.2	.2
Education [2]	2.615	104.5	104.6	4.7	.1	.0	.5	.4
Educational books and supplies	.194	257.0	257.1	6.1	.0	1.2	1.4	.3
Tuition, other school fees, and childcare	2.421	301.2	301.4	4.5	.1	-.1	.4	.4
Communication [1 2]	2.913	97.8	97.8	-2.3	.0	.0	-.1	.0
Information and information processing [1 2]	2.706	97.6	97.6	-2.5	.0	.0	-.1	.0
Telephone services [1 2]	2.357	100.7	101.1	-	.4	.3	.0	.4
Information and information processing other than telephone services [1 4]	.350	36.1	35.3	-25.8	-2.2	-2.4	-1.6	-2.2
Personal computers and peripheral equipment [1 2]	.234	67.5	65.6	-	-2.8	-3.7	-1.5	-2.8

See footnotes at end of table.

Table 1. Consumer Price Index for All Urban Consumers (CPI-U): U.S. city average, by expenditure category and commodity and service group-Continued

(1982-84=100, unless otherwise noted)

CPI-U	Relative importance, December 1997	Unadjusted indexes		Unadjusted percent change to Nov. 1998 from—		Seasonally adjusted percent change from—		
		Oct. 1998	Nov. 1998	Nov. 1997	Oct. 1998	Aug. to Sep.	Sep. to Oct.	Oct. to Nov.
Expenditure category								
Other goods and services	4.321	241.3	240.5	4.6	-0.3	0.9	0.3	-0.3
Tobacco and smoking products	.894	284.9	281.3	12.2	-1.3	3.3	.3	-1.1
Personal care [1]	3.427	158.1	158.0	2.4	-.1	.3	.4	-.1
Personal care products [1]	.737	149.4	148.8	1.8	-.4	.4	.2	-.4
Personal care services [1]	.963	167.5	167.6	2.5	.1	.3	.2	.1
Miscellaneous personal services	1.465	236.9	237.2	3.4	.1	.3	.3	.3
Commodity and service group								
Commodities	42.635	142.6	142.5	.1	-.1	-.1	.4	-.1
Food and beverages	16.310	162.4	162.5	2.3	.1	.0	.5	.2
Commodities less food and beverages	26.326	130.8	130.6	-1.2	-.2	-.2	.2	-.2
Nondurables less food and beverages	14.729	133.6	132.9	-1.8	-.5	-.3	.6	-.5
Apparel	4.944	135.6	135.0	.2	-.4	-.7	.1	.0
Nondurables less food, beverages, and apparel	9.785	137.6	136.8	-2.7	-.6	-.2	.6	-.4
Durables	11.596	126.9	127.4	-.4	.4	-.3	-.2	.2
Services	57.365	185.5	185.6	2.5	.1	.2	.2	.3
Rent of shelter [3]	29.410	191.5	191.5	3.5	.0	.5	.2	.3
Transportation services	6.984	188.2	188.3	1.1	.1	-.3	-.2	.1
Other services	10.625	219.0	219.5	3.2	.2	.2	.1	.3
Special indexes								
All items less food	84.674	164.4	164.3	1.4	-.1	.1	.2	.1
All items less shelter	70.212	157.9	157.9	.7	.0	-.1	.3	.1
All items less medical care	94.386	159.5	159.5	1.4	.0	.0	.3	.2
Commodities less food	27.309	132.3	132.1	-1.0	-.2	-.3	.3	-.2
Nondurables less food	15.712	135.6	135.0	-1.5	-.4	-.3	.5	-.2
Nondurables less food and apparel	10.768	139.5	138.8	-2.2	-.5	-.1	.6	-.3
Nondurables	31.039	148.1	147.8	.3	-.2	.0	.5	-.1
Services less rent of shelter [3]	27.955	192.6	192.7	1.5	.1	.0	.0	.3
Services less medical care services	52.973	179.7	179.7	2.5	.0	.2	.1	.3
Energy	7.013	101.3	100.5	-9.2	-.8	-1.3	.9	.0
All items less energy	92.987	172.2	172.3	2.4	.1	.1	.2	.1
All items less food and energy	77.661	174.7	174.8	2.3	.1	.2	.2	.2
Commodities less food and energy commodities	24.053	143.8	143.8	.7	.0	-.1	.0	-.1
Energy commodities	3.256	90.5	89.6	-13.8	-1.0	-2.1	2.4	-1.0
Services less energy services	53.608	192.3	192.4	3.1	.1	.3	.2	.3
Purchasing power of the consumer dollar (1982-84=$1.00)	-	$ .610	$ .610	-	-	-	-	-
Purchasing power of the consumer dollar (1967=$1.00)	-	$ .204	$ .204	-	-	-	-	-

[1] Not seasonally adjusted.
[2] Indexes on a December 1997=100 base.
[3] Indexes on a December 1982=100 base.
[4] Indexes on a December 1988=100 base.
- Data not available.
NOTE: Index applies to a month as a whole, not to any specific date.

Table 2. Consumer Price Index for All Urban Consumers (CPI-U): Seasonally adjusted U.S. city average, by expenditure category and commodity and service group

(1982-84=100, unless otherwise noted)

CPI-U

Expenditure category	Seasonally adjusted indexes				Seasonally adjusted annual rate percent change for					
					3 months ended—				6 months ended—	
	Aug. 1998	Sep. 1998	Oct. 1998	Nov. 1998	Feb. 1998	May 1998	Aug. 1998	Nov. 1998	May 1998	Nov. 1998
All items	163.6	163.6	164.0	164.3	0.5	2.2	1.7	1.7	1.4	1.7
Food and beverages	161.7	161.7	162.5	162.8	1.3	2.3	2.8	2.7	1.8	2.8
Food	161.4	161.4	162.3	162.5	1.3	2.5	2.5	2.8	1.9	2.6
Food at home	161.8	161.4	162.6	162.9	.5	2.5	2.8	2.7	1.5	2.8
Cereals and bakery products	182.1	182.1	182.4	182.8	1.3	2.5	3.6	1.5	1.9	2.6
Meats, poultry, fish, and eggs	148.1	147.1	147.4	147.1	-3.7	-.8	3.3	-2.7	-2.3	.3
Dairy and related products [1]	150.5	152.9	155.0	155.9	1.9	1.1	6.6	15.1	1.5	10.8
Fruits and vegetables	201.1	197.0	203.3	201.5	6.8	18.9	-4.6	.8	12.7	-2.0
Nonalcoholic beverages and beverage materials	132.1	132.1	132.6	133.3	-3.5	-4.7	-1.2	3.7	-4.1	1.2
Other food at home	152.0	152.5	152.7	153.8	.8	1.1	7.7	4.8	.9	6.3
Sugar and sweets	150.2	150.7	150.5	151.0	1.9	-1.1	3.3	2.1	.4	2.7
Fats and oils	149.9	152.7	156.6	156.2	-.8	.3	27.4	17.9	-.3	22.5
Other foods	166.5	166.4	165.8	167.7	3.2	1.7	5.0	2.9	2.5	3.9
Other miscellaneous foods [1 2]	103.5	103.6	103.5	104.8	-	4.0	8.5	5.1	-	6.8
Food away from home [1]	161.5	162.1	162.3	162.6	2.5	2.5	2.3	2.8	2.5	2.5
Other food away from home [1 2]	102.3	102.7	102.7	103.3	-	.8	6.9	4.0	-	5.4
Alcoholic beverages	165.8	166.5	166.7	167.1	1.7	-.2	2.7	3.2	.7	2.9
Housing	160.6	161.0	161.3	161.8	1.0	3.3	1.8	3.0	2.2	2.4
Shelter	182.4	183.3	183.7	184.2	3.4	4.1	2.4	4.0	3.7	3.2
Rent of primary residence	172.8	173.4	173.9	174.3	2.6	3.8	3.5	3.5	3.2	3.5
Lodging away from home [2]	101.4	104.2	103.9	105.2	-	7.4	-2.7	15.9	-	6.2
Owners' equivalent rent of primary residence [3]	186.5	189.0	189.6	189.9	3.5	3.7	2.8	3.0	3.6	2.9
Tenants' and household insurance [1 2]	99.2	99.2	99.7	99.9	-	-2.4	-1.6	2.9	-	.6
Fuels and utilities	127.8	127.0	126.8	127.6	-12.1	2.8	-3.1	-.6	-4.9	-1.9
Fuels	112.4	111.5	111.1	112.0	-17.9	2.9	-3.8	-1.4	-8.1	-2.6
Fuel oil and other fuels	89.7	88.2	87.5	86.7	-17.7	-.9	-8.4	-12.7	-9.7	-10.6
Gas (piped) and electricity	120.1	119.1	118.8	119.8	-18.0	2.7	-3.3	-1.0	-8.2	-2.1
Household furnishings and operations	126.8	126.4	126.6	126.8	2.3	1.0	1.3	.0	1.6	.6
Apparel	134.2	133.2	133.3	133.3	-.9	.6	4.0	-2.7	-.2	.6
Men's and boys' apparel	132.3	130.6	132.2	132.0	3.4	-1.5	2.5	-.9	.9	.8
Women's and girls' apparel	128.4	127.7	125.8	125.2	-2.5	3.9	6.1	-9.6	.6	-2.0
Infants' and toddlers' apparel [1]	124.4	124.9	130.2	131.3	-8.9	12.9	-7.7	24.1	1.4	7.1
Footwear	129.4	128.9	128.6	129.6	-4.3	-1.9	9.5	.6	-3.1	5.0
Transportation	141.7	141.1	141.5	141.5	-4.1	-2.0	.0	-.6	-3.0	-.3
Private transportation	137.9	137.5	138.1	138.1	-5.3	-2.0	-.6	.6	-3.7	.0
New and used motor vehicles [2]	100.7	100.8	100.7	100.9	-	.4	2.0	.8	-	1.4
New vehicles	143.9	143.7	143.2	143.2	-.6	-.8	2.0	-1.9	-.7	.0
Used cars and trucks [1]	151.1	151.9	153.0	154.0	2.2	4.4	3.0	7.9	3.3	5.4
Motor fuel	90.6	88.8	91.1	90.2	-29.2	-13.4	-9.9	-1.8	-21.7	-5.9
Gasoline (all types)	89.9	88.1	90.5	89.7	-29.6	-14.2	-10.0	-.9	-22.3	-5.6
Motor vehicle parts and equipment	101.3	101.3	101.5	101.3	-1.6	-1.6	2.4	.0	-1.6	1.2
Motor vehicle maintenance and repair	167.3	168.1	168.7	169.5	4.0	1.0	3.4	5.4	2.5	4.4
Public transportation	194.2	191.0	188.6	187.6	11.9	-2.5	8.7	-12.9	4.5	-2.7
Medical care	243.7	244.4	244.9	245.3	3.1	4.3	3.9	2.7	3.7	3.3
Medical care commodities	223.1	224.5	224.7	225.2	3.0	6.0	3.5	3.8	4.5	3.6
Medical care services	248.2	248.6	249.2	249.6	3.2	3.7	4.1	2.3	3.4	3.2
Professional services	223.3	224.0	224.4	224.9	3.2	3.9	3.7	2.9	3.5	3.3
Hospital and related services	289.5	289.5	290.5	291.1	3.6	2.7	5.1	2.2	3.2	3.7
Recreation [2]	101.2	101.3	101.0	101.2	-	1.6	.8	.0	-	.4
Video and audio [1 2]	101.2	101.4	101.1	100.8	3.6	.0	.0	-1.6	1.8	-.8

See footnotes at end of table.

Table 2. Consumer Price Index for All Urban Consumers (CPI-U): Seasonally adjusted U.S. city average, by expenditure category and commodity and service group-Continued

(1982-84=100, unless otherwise noted)

CPI-U

	Seasonally adjusted indexes				Seasonally adjusted annual rate percent change for					
					3 months ended—				6 months ended—	
	Aug. 1998	Sep. 1998	Oct. 1998	Nov. 1998	Feb. 1998	May 1998	Aug. 1998	Nov. 1998	May 1998	Nov. 1998
Expenditure category										
Education and communication [2]	100.4	100.4	100.6	100.8	-	3.7	-1.6	1.6	-	0.0
Education [2]	103.3	103.3	103.8	104.2	-	6.5	4.0	3.5	-	3.7
Educational books and supplies	250.1	253.2	256.8	257.6	3.5	8.4	.3	12.5	5.9	6.3
Tuition, other school fees, and childcare	296.4	296.1	297.4	298.5	4.8	6.4	4.0	2.9	5.6	3.4
Communication [1 2]	97.9	97.9	97.8	97.8	-3.5	.8	-5.9	-.4	-1.4	-3.2
Information and information processing [1 2]	97.7	97.7	97.6	97.6	-3.9	.8	-6.3	-.4	-1.6	-3.4
Telephone services [1 2]	100.4	100.7	100.7	101.1	-	4.5	-2.7	2.8	-	.0
Information and information processing other than telephone services [1 4]	37.6	36.7	36.1	35.3	-25.0	-23.0	-32.6	-22.3	-24.0	-27.6
Personal computers and peripheral equipment [1 2]	71.1	68.5	67.5	65.6	-	-32.7	-45.4	-27.5	-	-37.1
Other goods and services	238.7	240.9	241.7	241.0	6.8	5.8	2.9	3.9	6.3	3.4
Tobacco and smoking products	274.2	283.2	284.0	280.8	18.6	11.5	8.9	10.0	15.0	9.5
Personal care [1]	157.1	157.5	158.1	158.0	1.8	4.2	1.3	2.3	3.0	1.8
Personal care products [1]	148.5	149.1	149.4	148.8	1.7	7.3	-2.1	.8	4.4	-.7
Personal care services [1]	166.6	167.1	167.5	167.6	2.0	2.7	2.9	2.4	2.3	2.7
Miscellaneous personal services	235.7	236.5	237.3	237.9	2.6	3.0	4.2	3.8	2.8	4.0
Commodity and service group										
Commodities	142.2	142.0	142.5	142.4	-1.4	.3	.8	.6	-.6	.7
Food and beverages	161.7	161.7	162.5	162.8	1.3	2.3	2.8	2.7	1.8	2.8
Commodities less food and beverages	130.7	130.4	130.7	130.5	-3.0	-.9	.0	-.6	-2.0	-.3
Nondurables less food and beverages	132.6	132.2	133.0	132.4	-5.2	-.9	-.3	-.6	-3.1	-.5
Apparel	134.2	133.2	133.3	133.3	-.9	.6	4.0	-2.7	-.2	.6
Nondurables less food, beverages, and apparel	137.1	136.8	137.6	137.0	-8.3	-.6	-1.2	-.3	-4.5	-.7
Durables	127.8	127.4	127.2	127.4	-.3	-1.2	1.3	-1.2	-.8	.0
Services	184.8	185.2	185.5	186.0	2.0	3.6	2.0	2.6	2.8	2.3
Rent of shelter [3]	190.3	191.2	191.5	192.1	3.3	4.1	2.8	3.8	3.7	3.3
Transportation services	188.6	188.0	187.7	187.9	4.6	.0	1.7	-1.5	2.3	.1
Other services	218.1	218.6	218.8	219.5	3.2	4.6	2.4	2.6	3.9	2.5
Special indexes										
All items less food	163.8	163.9	164.2	164.4	.2	2.2	1.5	1.5	1.2	1.5
All items less shelter	157.6	157.4	157.8	158.0	-.8	1.3	1.3	1.0	.3	1.1
All items less medical care	158.9	158.9	159.3	159.6	.3	2.0	1.5	1.8	1.1	1.6
Commodities less food	132.3	131.9	132.3	132.1	-2.7	-1.2	.3	-.6	-1.9	-.2
Nondurables less food	134.6	134.2	134.9	134.6	-4.3	-.9	-.3	.0	-2.6	-.1
Nondurables less food and apparel	138.9	138.7	139.5	139.1	-7.4	-.9	-.6	.6	-4.2	.0
Nondurables	147.0	147.0	147.8	147.7	-1.9	.8	.5	1.9	-.5	1.2
Services less rent of shelter [3]	192.4	192.4	192.4	192.9	-.2	3.8	1.5	1.0	1.8	1.3
Services less medical care services	178.9	179.3	179.5	180.1	1.6	3.4	2.0	2.7	2.5	2.4
Energy	101.5	100.2	101.1	101.1	-22.9	-4.2	-6.4	-1.6	-14.0	-4.0
All items less energy	171.7	171.9	172.3	172.5	2.4	2.6	2.4	1.9	2.5	2.1
All items less food and energy	174.2	174.5	174.8	175.1	2.8	2.6	2.1	2.1	2.7	2.1
Commodities less food and energy commodities	143.7	143.6	143.6	143.5	1.1	.8	1.4	-.6	1.0	.4
Energy commodities	90.5	88.6	90.7	89.8	-28.5	-12.3	-9.6	-3.1	-20.8	-6.4
Services less energy services	191.4	191.9	192.3	192.8	3.5	3.4	2.5	3.0	3.5	2.8

[1] Not seasonally adjusted.
[2] Indexes on a December 1997=100 base.
[3] Indexes on a December 1982=100 base.
[4] Indexes on a December 1988=100 base.
- Data not available.
NOTE: Index applies to a month as a whole, not to any specific date.

Table 3. Consumer Price Index for All Urban Consumers (CPI-U): Selected areas, all items index

(1982-84=100, unless otherwise noted)

All items

CPI-U	Pricing schedule [1]	Indexes				Percent change to Nov.1998 from—			Percent change to Oct.1998 from—		
		Aug. 1998	Sep. 1998	Oct. 1998	Nov. 1998	Nov. 1997	Sep. 1998	Oct. 1998	Oct. 1997	Aug. 1998	Sep. 1998
U.S. city average	M	163.4	163.6	164.0	164.0	1.5	0.2	0.0	1.5	0.4	0.2
Region and area size [2]											
Northeast urban	M	170.5	170.6	171.3	171.2	1.6	.4	-.1	1.5	.5	.4
Size A - More than 1,500,000	M	171.4	171.7	172.3	172.2	1.7	.3	-.1	1.7	.5	.3
Size B/C 50,000 to 1,500,000 [3]	M	102.2	102.2	102.6	102.6	1.3	.4	.0	1.2	.4	.4
Midwest urban [4]	M	159.5	159.9	160.1	160.1	1.5	.1	.0	1.5	.4	.1
Size A - More than 1,500,000	M	161.0	161.4	161.4	161.3	1.8	-.1	-.1	1.9	.2	.0
Size B/C - 50,000 to 1,500,000 [3]	M	102.0	102.2	102.4	102.4	1.1	.2	.0	1.1	.4	.2
Size D - Nonmetropolitan (less than 50,000)	M	153.3	154.0	154.3	154.7	.7	.5	.3	.7	.7	.2
South urban	M	159.5	159.5	159.8	159.6	1.1	.1	-.1	1.3	.2	.2
Size A - More than 1,500,000	M	158.9	158.8	159.0	158.6	1.4	-.1	-.3	1.5	.1	.1
Size B/C - 50,000 to 1,500,000 [3]	M	102.5	102.5	102.8	102.8	.9	.3	.0	1.0	.3	.3
Size D - Nonmetropolitan (less than 50,000)	M	160.2	160.1	159.8	160.0	1.8	-.1	.1	1.8	-.2	-.2
West urban	M	164.8	165.1	165.5	165.8	1.8	.4	.2	1.7	.4	.2
Size A - More than 1,500,000	M	165.6	165.9	166.3	166.5	2.3	.4	.1	2.0	.4	.2
Size B/C - 50,000 to 1,500,000 [3]	M	102.5	102.7	103.0	103.5	1.1	.8	.5	.9	.5	.3
Size classes											
A [5]	M	148.1	148.2	148.5	148.5	1.9	.2	.0	1.7	.3	.2
B/C [3]	M	102.4	102.4	102.7	102.8	1.1	.4	.1	1.0	.3	.3
D	M	159.4	159.7	159.7	159.9	1.3	.1	.1	1.3	.2	.0
Selected local areas [6]											
Chicago-Gary-Kenosha, IL-IN-WI	M	165.4	165.3	165.7	165.4	1.5	.1	-.2	2.0	.2	.2
Los Angeles-Riverside-Orange County, CA	M	162.6	162.6	163.2	163.4	1.7	.5	.1	1.3	.4	.4
New York-Northern N.J.-Long Island, NY-NJ-CT-PA	M	174.2	174.4	174.8	174.7	1.6	.2	-.1	1.5	.3	.2
Boston-Brockton-Nashua, MA-NH-ME-CT	1	-	172.1	-	173.3	2.3	.7	-	-	-	-
Cleveland-Akron, OH	1	-	161.5	-	160.8	2.4	-.4	-	-	-	-
Dallas-Fort Worth, TX	1	-	154.5	-	154.0	-	-.3	-	-	-	-
Washington-Baltimore, DC-MD-VA-WV [7]	1	-	102.9	-	102.4	1.9	-.5	-	-	-	-
Atlanta, GA	2	161.9	-	162.0	-	-	-	-	-	.1	-
Detroit-Ann Arbor-Flint, MI	2	160.5	-	161.0	-	-	-	-	2.0	.3	-
Houston-Galveston-Brazoria, TX	2	147.4	-	148.5	-	-	-	-	.8	.7	-
Miami-Fort Lauderdale, FL	2	160.8	-	161.1	-	-	-	-	-	.2	-
Philadelphia-Wilmington-Atlantic City, PA-NJ-DE-MD	2	168.6	-	170.3	-	-	-	-	1.6	1.0	-
San Francisco-Oakland-San Jose, CA	2	166.6	-	167.2	-	-	-	-	2.9	.4	-
Seattle-Tacoma-Bremerton, WA	2	168.5	-	169.3	-	-	-	-	-	.5	-

[1] Foods, fuels, and several other items priced every month in all areas; most other goods and services priced as indicated:
M - Every month.
1 - January, March, May, July, September, and November.
2 - February, April, June, August, October, and December.

[2] Regions defined as the four Census regions. See map in technical notes.

[3] Indexes on a December 1996=100 base.

[4] The 'North Central' region has been renamed the 'Midwest' region by the Census Bureau. It is composed of the same geographic entities.

[5] Indexes on a December 1986=100 base.

[6] In addition, the following metropolitan areas are published semiannually and appear in Tables 34 and 39 of the January and July issues of the CPI Detailed Report: Anchorage, AK; Cincinnati-Hamilton, OH-KY-IN; Denver-Boulder-Greeley, CO; Honolulu, HI; Kansas City, MO-KS; Milwaukee-Racine, WI; Minneapolis-St. Paul, MN-WI; Pittsburgh, PA; Portland-Salem, OR-WA; St. Louis, MO-IL; San Diego, CA; Tampa-St. Petersburg-Clearwater, FL.

[7] Indexes on a November 1996=100 base.

- Data not available.

NOTE: Index applies to a month as a whole, not to any specific date.

NOTE: Local area indexes are byproducts of the national CPI program. Each local index has a smaller sample size than the national index and is, therefore, subject to substantially more sampling and other measurement error. As a result, local area indexes show greater volatility than the national index, although their long-term trends are similar. Therefore, the Bureau of Labor Statistics strongly urges users to consider adopting the national average CPI for use in their escalator clauses.

Table 4. Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W): U.S. city average, by expenditure category and commodity and service group

(1982-84=100, unless otherwise noted)

CPI-W

Expenditure category	Relative importance, December 1997	Unadjusted indexes		Unadjusted percent change to Nov. 1998 from—		Seasonally adjusted percent change from—		
		Oct. 1998	Nov. 1998	Nov. 1997	Oct. 1998	Aug. to Sep.	Sep. to Oct.	Oct. to Nov.
All items	100.000	160.6	160.7	1.4	0.1	0.1	0.3	0.1
All items (1967=100)	-	478.4	478.6	-	-	-	-	-
Food and beverages	17.903	161.6	161.7	2.1	.1	.0	.5	.2
Food	16.861	161.3	161.4	2.2	.1	-.1	.5	.2
Food at home	10.785	161.3	161.3	2.0	.0	-.2	.7	.1
Cereals and bakery products	1.678	181.9	181.9	2.3	.0	.1	.1	.3
Meats, poultry, fish, and eggs	3.125	147.5	147.6	-.9	.1	-.7	.2	-.2
Dairy and related products [1]	1.135	154.6	155.5	5.9	.6	1.7	1.3	.6
Fruits and vegetables	1.447	198.4	197.6	4.9	-.4	-2.0	3.3	-.9
Nonalcoholic beverages and beverage materials	1.215	131.3	131.4	-1.4	.1	-.1	.3	.5
Other food at home	2.185	151.9	152.0	3.4	.1	.2	.1	.7
Sugar and sweets	.420	150.2	149.5	1.5	-.5	.1	-.1	.3
Fats and oils	.332	156.1	154.4	10.1	-1.1	1.7	2.6	-.4
Other foods	1.432	165.7	166.6	3.3	.5	-.1	-.5	1.1
Other miscellaneous foods [1 2]	.344	103.3	104.9	-	1.5	.2	-.4	1.5
Food away from home [1]	6.076	162.3	162.6	2.5	.2	.4	.2	.2
Other food away from home [1 2]	.212	102.8	103.4	-	.6	.6	.0	.6
Alcoholic beverages	1.042	165.4	165.7	1.8	.2	.3	.2	.3
Housing	36.450	157.6	157.7	2.1	.1	.2	.2	.3
Shelter	27.033	178.4	178.6	3.4	.1	.4	.3	.3
Rent of primary residence	8.347	173.5	174.1	3.4	.3	.3	.3	.2
Lodging away from home [2]	1.346	109.7	106.6	-	-2.8	2.7	.3	1.2
Owners' equivalent rent of primary residence [3]	17.016	172.9	173.4	3.3	.3	.2	.3	.2
Tenants' and household insurance [1 2]	.324	100.0	100.3	-	.3	.0	.6	.3
Fuels and utilities	5.053	126.9	126.4	-3.4	-.4	-.6	-.2	.7
Fuels	4.143	111.6	110.9	-5.5	-.6	-.9	-.2	.7
Fuel oil and other fuels	.229	86.9	87.4	-9.3	.6	-1.8	-.7	-.7
Gas (piped) and electricity	3.914	119.1	118.3	-5.3	-.7	-.8	-.3	.8
Household furnishings and operations	4.365	124.9	124.8	.9	-.1	-.4	.2	.2
Apparel	5.300	134.3	134.0	.3	-.2	-.5	.4	.1
Men's and boys' apparel	1.503	134.1	134.0	1.0	-.1	-1.0	1.7	-.3
Women's and girls' apparel	1.985	126.9	125.9	-.9	-.8	-.1	-1.2	-.3
Infants' and toddlers' apparel [1]	.337	131.0	132.7	4.4	1.3	.6	4.1	1.3
Footwear	1.082	130.9	130.9	.4	.0	-.3	-.2	.6
Transportation	19.847	140.4	140.6	-1.7	.1	-.4	.4	.0
Private transportation	18.790	137.9	138.2	-1.8	.2	-.3	.5	.0
New and used motor vehicles [2]	9.285	100.4	101.1	1.2	.7	.0	.0	.4
New vehicles	5.304	143.6	144.7	-.3	.8	-.2	-.4	.1
Used cars and trucks [1]	3.162	154.2	155.2	4.0	.6	.5	.7	.6
Motor fuel	3.682	90.9	89.7	-14.1	-1.3	-2.1	2.6	-1.1
Gasoline (all types)	3.658	90.4	89.2	-14.2	-1.3	-2.0	2.8	-1.0
Motor vehicle parts and equipment	.694	100.7	100.7	.0	.0	.0	.2	-.1
Motor vehicle maintenance and repair	1.664	170.3	170.8	3.5	.3	.5	.5	.4
Public transportation	1.057	186.3	184.2	.2	-1.1	-1.7	-1.2	-.4
Medical care	4.591	243.7	244.0	3.5	.1	.3	.2	.2
Medical care commodities	.906	220.8	221.1	3.8	.1	.7	-.1	.2
Medical care services	3.684	248.8	249.1	3.4	.1	.2	.2	.2
Professional services	2.372	225.8	225.9	3.4	.0	.4	.3	.1
Hospital and related services	1.097	286.4	286.9	3.4	.2	.0	.4	.2
Recreation [2]	5.969	100.8	100.8	.8	.0	.0	-.3	.1
Video and audio [1 2]	1.968	101.0	100.8	.5	-.2	.2	-.3	-.2
Education and communication [2]	5.396	101.1	101.2	1.2	.1	.1	.1	.3
Education [2]	2.402	104.5	104.6	4.7	.1	.2	.5	.3
Educational books and supplies	.192	259.4	259.5	6.0	.0	1.2	1.5	.3
Tuition, other school fees, and childcare	2.211	295.2	295.4	4.6	.1	.0	.4	.4
Communication [1 2]	2.994	98.4	98.5	-1.6	.1	.1	-.1	.1
Information and information processing [1 2]	2.841	98.3	98.4	-1.7	.1	.1	-.1	.1
Telephone services [1 2]	2.547	100.8	101.2	-	.4	.3	.0	.4
Information and information processing other than telephone services [1 4]	.294	37.4	36.6	-25.8	-2.1	-1.8	-2.1	-2.1
Personal computers and peripheral equipment [1 2]	.191	67.5	65.3	-	-3.3	-3.1	-2.2	-3.3

See footnotes at end of table.

Table 4. Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W): U.S. city average, by expenditure category and commodity and service group-Continued

(1982-84=100, unless otherwise noted)

CPI-W	Relative importance, December 1997	Unadjusted indexes		Unadjusted percent change to Nov. 1998 from—		Seasonally adjusted percent change from—		
		Oct. 1998	Nov. 1998	Nov. 1997	Oct. 1998	Aug. to Sep.	Sep. to Oct.	Oct. to Nov.
Expenditure category								
Other goods and services	4.544	240.4	239.2	5.5	-0.5	1.3	0.3	-0.5
Tobacco and smoking products	1.300	285.2	281.4	12.3	-1.3	3.4	.2	-1.2
Personal care [1]	3.244	158.3	158.1	2.5	-.1	.3	.4	-.1
Personal care products [1]	.832	150.4	149.8	1.8	-.4	.3	.2	-.4
Personal care services [1]	.964	167.8	168.0	2.6	.1	.2	.2	.1
Miscellaneous personal services	1.226	236.6	236.9	3.8	.1	.6	.3	.3
Commodity and service group								
Commodities	47.234	142.4	142.4	.2	.0	-.1	.4	.0
Food and beverages	17.903	161.6	161.7	2.1	.1	.0	.5	.2
Commodities less food and beverages	29.331	131.0	130.9	-1.1	-.1	-.2	.3	-.1
Nondurables less food and beverages	15.928	133.2	132.5	-1.9	-.5	-.2	.8	-.5
Apparel	5.300	134.3	134.0	.3	-.2	-.5	.4	.1
Nondurables less food, beverages, and apparel	10.628	137.3	136.3	-3.0	-.7	-.3	.9	-.7
Durables	13.403	126.9	127.4	.1	.4	-.2	-.1	.2
Services	52.766	182.3	182.4	2.4	.1	.2	.2	.3
Rent of shelter [3]	26.708	171.8	172.0	3.4	.1	.5	.3	.3
Transportation services	6.824	185.8	186.1	1.1	.2	-.3	-.1	.1
Other services	10.006	215.7	216.2	3.2	.2	.3	.1	.3
Special indexes								
All items less food	83.139	160.4	160.4	1.2	.0	.1	.2	.2
All items less shelter	72.967	155.7	155.7	.6	.0	-.1	.3	.1
All items less medical care	95.409	156.8	156.8	1.2	.0	.0	.3	.1
Commodities less food	30.373	132.4	132.2	-1.0	-.2	-.2	.3	-.1
Nondurables less food	16.970	135.2	134.5	-1.6	-.5	-.2	.7	-.3
Nondurables less food and apparel	11.670	139.0	138.2	-2.5	-.6	-.2	1.0	-.4
Nondurables	33.831	147.7	147.4	.3	-.2	-.1	.5	.0
Services less rent of shelter [3]	26.057	171.3	171.4	1.4	.1	.1	.0	.2
Services less medical care services	49.082	176.6	176.8	2.3	.1	.2	.1	.3
Energy	7.825	100.5	99.6	-9.5	-.9	-1.4	1.0	-.1
All items less energy	92.175	168.9	169.1	2.3	.1	.2	.2	.2
All items less food and energy	75.315	170.9	171.1	2.3	.1	.2	.2	.2
Commodities less food and energy commodities	26.463	143.5	143.6	1.0	.1	.1	.1	.0
Energy commodities	3.910	90.8	89.7	-13.8	-1.2	-2.1	2.4	-1.1
Services less energy services	48.852	189.3	189.6	3.0	.2	.3	.2	.3
Purchasing power of the consumer dollar (1982-84=$1.00)	-	$ .623	$ .622	-	-	-	-	-
Purchasing power of the consumer dollar (1967=$1.00)	-	$ .209	$ .209	-	-	-	-	-

[1] Not seasonally adjusted.
[2] Indexes on a December 1997=100 base.
[3] Indexes on a December 1984=100 base
[4] Indexes on a December 1988=100 base.
- Data not available.
NOTE: Index applies to a month as a whole, not to any specific date.

Table 5. Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W): Seasonally adjusted U.S. city average, by expenditure category and commodity and service group

(1982-84=100, unless otherwise noted)

CPI-W

Expenditure category	Seasonally adjusted indexes				Seasonally adjusted annual rate percent change for					
					3 months ended—				6 months ended—	
	Aug. 1998	Sep. 1998	Oct. 1998	Nov. 1998	Feb. 1998	May 1998	Aug. 1998	Nov. 1998	May 1998	Nov. 1998
All items	160.0	160.1	160.6	160.8	0.3	2.0	1.3	2.0	1.1	1.6
Food and beverages	161.1	161.1	161.9	162.2	1.3	2.3	2.5	2.8	1.8	2.6
Food	160.8	160.7	161.5	161.8	1.0	2.5	2.8	2.5	1.8	2.6
Food at home	160.8	160.4	161.5	161.7	.3	2.5	2.8	2.3	1.4	2.5
Cereals and bakery products	181.9	182.0	182.1	182.6	1.4	2.7	3.6	1.5	2.0	2.6
Meats, poultry, fish, and eggs	147.8	146.7	147.0	146.7	-3.7	-.8	3.6	-2.9	-2.3	.3
Dairy and related products [1]	150.1	152.6	154.6	155.5	1.6	1.1	6.4	15.2	1.4	10.7
Fruits and vegetables	200.4	196.4	202.9	201.1	7.1	18.9	-5.0	1.4	12.8	-1.9
Nonalcoholic beverages and beverage materials	131.0	130.9	131.3	132.0	-3.5	-4.7	-.6	3.1	-4.1	1.2
Other food at home	151.5	151.8	152.0	153.1	1.1	1.1	8.0	4.3	1.1	6.1
Sugar and sweets	150.3	150.4	150.2	150.7	1.9	-.8	3.8	1.1	.5	2.4
Fats and oils	149.5	152.1	156.1	155.5	-.8	.9	26.0	17.0	.0	21.5
Other foods	166.6	166.5	165.7	167.6	3.7	1.7	5.2	2.4	2.7	3.8
Other miscellaneous foods [1 2]	103.5	103.7	103.3	104.9	-	4.0	8.1	5.5	-	6.8
Food away from home [1]	161.4	162.0	162.3	162.6	2.5	2.5	2.0	3.0	2.5	2.5
Other food away from home [1 2]	102.2	102.8	102.8	103.4	-	1.2	6.5	4.8	-	5.6
Alcoholic beverages	164.7	165.2	165.5	166.0	1.5	-.5	2.7	3.2	.5	3.0
Housing	156.9	157.2	157.5	158.0	.5	3.4	1.5	2.8	1.9	2.2
Shelter	177.2	177.9	178.4	178.9	3.5	3.7	2.8	3.9	3.6	3.3
Rent of primary residence	172.4	173.0	173.5	173.9	2.6	3.8	3.3	3.5	3.2	3.4
Lodging away from home [2]	101.3	104.0	104.3	105.6	-	8.2	-3.1	18.1	-	7.0
Owners' equivalent rent of primary residence [3]	171.8	172.2	172.7	173.0	3.6	3.6	2.8	2.8	3.6	2.8
Tenants' and household insurance [1 2]	99.4	99.4	100.0	100.3	-	-2.0	-1.2	3.7	-	1.2
Fuels and utilities	127.4	126.6	126.4	127.3	-12.2	2.5	-3.1	-.3	-5.1	-1.7
Fuels	111.7	110.7	110.5	111.3	-18.0	2.5	-3.8	-1.4	-8.3	-2.6
Fuel oil and other fuels	90.1	88.5	87.9	87.3	-17.4	.9	-8.0	-11.9	-8.7	-10.0
Gas (piped) and electricity	119.3	118.4	118.1	119.1	-18.3	2.7	-3.9	-.7	-8.4	-2.3
Household furnishings and operations	125.2	124.7	124.9	125.1	2.6	1.0	.6	-.3	1.8	.2
Apparel	132.2	131.6	132.1	132.2	-2.7	.0	3.4	.0	-1.4	1.7
Men's and boys' apparel	131.5	130.2	132.4	132.0	1.2	.0	1.2	1.5	.6	1.4
Women's and girls' apparel	125.7	125.6	124.1	123.7	-4.4	2.0	5.6	-6.2	-1.3	-.5
Infants' and toddlers' apparel [1]	125.0	125.8	131.0	132.7	-12.0	14.7	-7.3	27.0	.5	8.5
Footwear	130.0	129.6	129.4	130.2	-4.8	-2.8	9.4	.6	-3.8	4.9
Transportation	140.5	139.9	140.5	140.5	-4.7	-2.0	-.3	.0	-3.3	-.1
Private transportation	137.6	137.4	138.1	138.1	-5.6	-1.7	-.9	.9	-3.7	.0
New and used motor vehicles [2]	100.9	100.9	100.9	101.3	-	.8	2.4	1.6	-	2.0
New vehicles	145.1	144.8	144.2	144.4	-.8	-.6	2.0	-1.9	-.7	.0
Used cars and trucks [1]	152.4	153.2	154.2	155.2	1.9	3.8	2.9	7.6	2.8	5.2
Motor fuel	90.7	88.8	91.1	90.1	-28.4	-12.6	-10.3	-2.6	-20.9	-6.5
Gasoline (all types)	90.0	88.2	90.7	89.8	-29.0	-13.8	-10.4	-.9	-21.8	-5.8
Motor vehicle parts and equipment	100.6	100.6	100.8	100.7	-.4	-2.4	2.4	.4	-1.4	1.4
Motor vehicle maintenance and repair	168.5	169.3	170.2	170.8	3.7	1.2	3.6	5.6	2.4	4.6
Public transportation	190.6	187.4	185.2	184.4	9.0	-2.3	7.9	-12.4	3.2	-2.8
Medical care	242.9	243.7	244.1	244.6	3.1	4.1	4.1	2.8	3.6	3.4
Medical care commodities	219.9	221.5	221.3	221.8	2.3	6.1	3.3	3.5	4.2	3.4
Medical care services	248.0	248.5	249.1	249.6	3.4	3.7	4.3	2.6	3.5	3.5
Professional services	224.6	225.5	226.2	226.4	3.3	3.5	3.5	3.2	3.4	3.4
Hospital and related services	285.6	285.6	286.7	287.2	3.8	2.4	5.2	2.3	3.1	3.7
Recreation [2]	101.0	101.0	100.7	100.8	-	.8	.8	-.8	-	.0
Video and audio [1 2]	101.1	101.3	101.0	100.8	3.6	-.4	.0	-1.2	1.6	-.6

See footnotes at end of table.

Table 5. Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W): Seasonally adjusted U.S. city average, by expenditure category and commodity and service group-Continued

(1982-84=100, unless otherwise noted)

CPI-W

	Seasonally adjusted indexes				Seasonally adjusted annual rate percent change for					
					3 months ended—				6 months ended—	
	Aug. 1998	Sep. 1998	Oct. 1998	Nov. 1998	Feb. 1998	May 1998	Aug. 1998	Nov. 1998	May 1998	Nov. 1998
Expenditure category										
Education and communication [2]	100.6	100.7	100.8	101.1	-	4.1	-1.2	2.0	-	0.4
Education [2]	103.2	103.4	103.9	104.2	-	6.5	3.6	3.9	-	3.7
Educational books and supplies	252.3	255.3	259.1	260.0	3.8	8.7	-.5	12.8	6.2	5.9
Tuition, other school fees, and childcare	290.5	290.6	291.7	292.8	4.8	6.2	4.2	3.2	5.5	3.7
Communication [1 2]	98.4	98.5	98.4	98.5	-3.2	1.6	-5.1	.4	-.8	-2.4
Information and information processing [1 2]	98.3	98.4	98.3	98.4	-3.2	1.6	-5.5	.4	-.8	-2.6
Telephone services [1 2]	100.5	100.8	100.8	101.2	-	4.9	-2.7	2.8	-	.0
Information and information processing other than telephone services [1 4]	38.9	38.2	37.4	36.6	-25.5	-25.2	-30.5	-21.6	-25.3	-26.2
Personal computers and peripheral equipment [1 2]	71.2	69.0	67.5	65.3	-	-34.7	-42.9	-29.2	-	-36.4
Other goods and services	236.7	239.7	240.4	239.3	8.2	6.6	3.6	4.5	7.4	4.0
Tobacco and smoking products	274.5	283.7	284.3	280.8	19.2	11.5	9.6	9.5	15.3	9.5
Personal care [1]	157.2	157.7	158.3	158.1	1.8	4.5	1.3	2.3	3.1	1.8
Personal care products [1]	149.6	150.1	150.4	149.8	1.4	8.1	-2.4	.5	4.7	-.5
Personal care services [1]	167.0	167.4	167.8	168.0	2.0	3.0	3.2	2.4	2.5	2.8
Miscellaneous personal services	234.9	236.2	236.8	237.4	3.2	3.0	4.6	4.3	3.1	4.4
Commodity and service group										
Commodities	142.0	141.8	142.4	142.4	-1.4	.0	1.1	1.1	-.7	1.1
Food and beverages	161.1	161.1	161.9	162.2	1.3	2.3	2.5	2.8	1.8	2.6
Commodities less food and beverages	130.6	130.3	130.7	130.6	-3.3	-.9	.0	.0	-2.1	.0
Nondurables less food and beverages	131.8	131.5	132.6	132.0	-5.8	-1.2	-1.2	.6	-3.5	-.3
Apparel	132.2	131.6	132.1	132.2	-2.7	.0	3.4	.0	-1.4	1.7
Nondurables less food, beverages, and apparel	136.5	136.1	137.3	136.4	-8.5	-.9	-2.0	-.3	-4.8	-1.2
Durables	127.5	127.2	127.1	127.4	.3	-1.2	1.6	-.3	-.5	.6
Services	181.5	181.9	182.2	182.7	1.6	3.4	2.0	2.7	2.5	2.3
Rent of shelter [3]	170.5	171.3	171.8	172.4	3.2	3.4	2.9	4.5	3.3	3.7
Transportation services	186.0	185.5	185.4	185.6	3.8	.6	1.1	-.9	2.2	.1
Other services	214.6	215.3	215.5	216.2	3.3	4.6	1.9	3.0	4.0	2.4
Special indexes										
All items less food	159.6	159.7	160.0	160.3	-.3	2.0	1.3	1.8	.9	1.5
All items less shelter	155.3	155.1	155.5	155.7	-1.0	1.3	1.0	1.0	.1	1.0
All items less medical care	156.1	156.1	156.6	156.8	.0	1.8	1.3	1.8	.9	1.5
Commodities less food	132.1	131.9	132.3	132.2	-3.3	-.9	.0	.3	-2.1	.2
Nondurables less food	133.8	133.5	134.5	134.1	-5.7	-.6	-.9	.9	-3.2	.0
Nondurables less food and apparel	138.2	137.9	139.3	138.7	-8.4	-1.7	-1.1	1.5	-5.1	.1
Nondurables	146.7	146.6	147.3	147.3	-2.4	1.4	.8	1.6	-.5	1.2
Services less rent of shelter [3]	171.2	171.3	171.3	171.6	-.7	4.1	1.2	.9	1.7	1.1
Services less medical care services	176.0	176.3	176.4	177.0	.9	3.7	2.3	2.3	2.3	2.3
Energy	100.7	99.3	100.3	100.2	-23.0	-4.9	-6.8	-2.0	-14.4	-4.4
All items less energy	168.3	168.6	168.9	169.2	2.2	2.7	2.2	2.2	2.4	2.2
All items less food and energy	170.4	170.7	171.0	171.3	2.4	2.6	2.1	2.1	2.5	2.1
Commodities less food and energy commodities	143.2	143.3	143.4	143.4	1.1	.8	1.4	.6	1.0	1.0
Energy commodities	90.7	88.8	90.9	89.9	-27.6	-12.3	-9.9	-3.5	-20.3	-6.8
Services less energy services	188.6	189.1	189.5	190.0	3.3	3.5	2.4	3.0	3.4	2.7

[1] Not seasonally adjusted.
[2] Indexes on a December 1997=100 base.
[3] Indexes on a December 1984=100 base
[4] Indexes on a December 1988=100 base.
- Data not available.

NOTE: Index applies to a month as a whole, not to any specific date.

Table 5. Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W): Seasonally adjusted U.S. city average, by expenditure category and commodity and service group-Continued

(1982-84=100, unless otherwise noted)

CPI-W

	Seasonally adjusted indexes				Seasonally adjusted annual rate percent change for					
					3 months ended—				6 months ended—	
	Aug. 1998	Sep. 1998	Oct. 1998	Nov. 1998	Feb. 1998	May 1998	Aug. 1998	Nov. 1998	May 1998	Nov. 1998
Expenditure category										
Education and communication [2]	100.6	100.7	100.8	101.1	-	4.1	-1.2	2.0	-	0.4
Education [2]	103.2	103.4	103.9	104.2	-	6.5	3.6	3.9	-	3.7
Educational books and supplies	252.3	255.3	259.1	260.0	3.8	8.7	-.5	12.8	6.2	5.9
Tuition, other school fees, and childcare	290.5	290.6	291.7	292.8	4.8	6.2	4.2	3.2	5.5	3.7
Communication [1 2]	98.4	98.5	98.4	98.5	-3.2	1.6	-5.1	.4	-.8	-2.4
Information and information processing [1 2]	98.3	98.4	98.3	98.4	-3.2	1.6	-5.5	.4	-.8	-2.6
Telephone services [1 2]	100.5	100.8	100.8	101.2	-	4.9	-2.7	2.8	-	.0
Information and information processing other than telephone services [1 4]	38.9	38.2	37.4	36.6	-25.5	-25.2	-30.5	-21.6	-25.3	-26.2
Personal computers and peripheral equipment [1 2]	71.2	69.0	67.5	65.3	-	-34.7	-42.9	-29.2	-	-36.4
Other goods and services	236.7	239.7	240.4	239.3	8.2	6.6	3.6	4.5	7.4	4.0
Tobacco and smoking products	274.5	283.7	284.3	280.8	19.2	11.5	9.6	9.5	15.3	9.5
Personal care [1]	157.2	157.7	158.3	158.1	1.8	4.5	1.3	2.3	3.1	1.8
Personal care products [1]	149.6	150.1	150.4	149.8	1.4	8.1	-2.4	.5	4.7	-.5
Personal care services [1]	167.0	167.4	167.8	168.0	2.0	3.0	3.2	2.4	2.5	2.8
Miscellaneous personal services	234.9	236.2	236.8	237.4	3.2	3.0	4.6	4.3	3.1	4.4
Commodity and service group										
Commodities	142.0	141.8	142.4	142.4	-1.4	.0	1.1	1.1	-.7	1.1
Food and beverages	161.1	161.1	161.9	162.2	1.3	2.3	2.5	2.8	1.8	2.6
Commodities less food and beverages	130.6	130.3	130.7	130.6	-3.3	-.9	.0	.0	-2.1	.0
Nondurables less food and beverages	131.8	131.5	132.6	132.0	-5.8	-1.2	-1.2	.6	-3.5	-.3
Apparel	132.2	131.6	132.1	132.2	-2.7	.0	3.4	.0	-1.4	1.7
Nondurables less food, beverages, and apparel	136.5	136.1	137.3	136.4	-8.5	-.9	-2.0	-.3	-4.8	-1.2
Durables	127.5	127.2	127.1	127.4	.3	-1.2	1.6	-.3	-.5	.6
Services	181.5	181.9	182.2	182.7	1.6	3.4	2.0	2.7	2.5	2.3
Rent of shelter [3]	170.5	171.3	171.8	172.4	3.2	3.4	2.9	4.5	3.3	3.7
Transportation services	186.0	185.5	185.4	185.6	3.8	.6	1.1	-.9	2.2	.1
Other services	214.6	215.3	215.5	216.2	3.3	4.6	1.9	3.0	4.0	2.4
Special indexes										
All items less food	159.6	159.7	160.0	160.3	-.3	2.0	1.3	1.8	.9	1.5
All items less shelter	155.3	155.1	155.5	155.7	-1.0	1.3	1.0	1.0	.1	1.0
All items less medical care	156.1	156.1	156.6	156.8	.0	1.8	1.3	1.8	.9	1.5
Commodities less food	132.1	131.9	132.3	132.2	-3.3	-.9	.0	.3	-2.1	.2
Nondurables less food	133.8	133.5	134.5	134.1	-5.7	-.6	-.9	.9	-3.2	.0
Nondurables less food and apparel	138.2	137.9	139.3	138.7	-8.4	-1.7	-1.1	1.5	-5.1	.1
Nondurables	146.7	146.6	147.3	147.3	-2.4	1.4	.8	1.6	-.5	1.2
Services less rent of shelter [3]	171.2	171.3	171.3	171.6	-.7	4.1	1.2	.9	1.7	1.1
Services less medical care services	176.0	176.3	176.4	177.0	.9	3.7	2.3	2.3	2.3	2.3
Energy	100.7	99.3	100.3	100.2	-23.0	-4.9	-6.8	-2.0	-14.4	-4.4
All items less energy	168.3	168.6	168.9	169.2	2.2	2.7	2.2	2.2	2.4	2.2
All items less food and energy	170.4	170.7	171.0	171.3	2.4	2.6	2.1	2.1	2.5	2.1
Commodities less food and energy commodities	143.2	143.3	143.4	143.4	1.1	.8	1.4	.6	1.0	1.0
Energy commodities	90.7	88.8	90.9	89.9	-27.6	-12.3	-9.9	-3.5	-20.3	-6.8
Services less energy services	188.6	189.1	189.5	190.0	3.3	3.5	2.4	3.0	3.4	2.7

[1] Not seasonally adjusted.
[2] Indexes on a December 1997=100 base.
[3] Indexes on a December 1984=100 base
[4] Indexes on a December 1988=100 base.
- Data not available.

NOTE: Index applies to a month as a whole, not to any specific date.

Table 6. Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W): Selected areas, all items index

(1982-84=100, unless otherwise noted)

All items

CPI-W	Pricing schedule [1]	Indexes				Percent change to Nov.1998 from—			Percent change to Oct.1998 from—		
		Aug. 1998	Sep. 1998	Oct. 1998	Nov. 1998	Nov. 1997	Sep. 1998	Oct. 1998	Oct. 1997	Aug. 1998	Sep. 1998
U.S. city average	M	160.0	160.2	160.6	160.7	1.4	0.3	0.1	1.3	0.4	0.2
Region and area size[2]											
Northeast urban	M	167.1	167.4	168.1	168.2	1.5	.5	.1	1.4	.6	.4
Size A - More than 1,500,000	M	167.1	167.5	168.1	168.2	1.6	.4	.1	1.6	.6	.4
Size B/C 50,000 to 1,500,000 [3]	M	101.7	101.8	102.2	102.2	1.1	.4	.0	1.0	.5	.4
Midwest urban [4]	M	155.6	156.0	156.2	156.2	1.4	.1	.0	1.4	.4	.1
Size A - More than 1,500,000	M	156.4	156.7	156.7	156.7	1.9	.0	.0	1.8	.2	.0
Size B/C - 50,000 to 1,500,000 [3]	M	101.7	101.9	102.1	102.1	.9	.2	.0	.9	.4	.2
Size D - Nonmetropolitan (less than 50,000)	M	151.4	152.2	152.4	152.9	.9	.5	.3	.9	.7	.1
South urban	M	157.5	157.5	157.8	157.7	1.0	.1	-.1	1.1	.2	.2
Size A - More than 1,500,000	M	156.3	156.3	156.6	156.2	1.1	-.1	-.3	1.2	.2	.2
Size B/C - 50,000 to 1,500,000 [3]	M	102.1	102.1	102.4	102.4	.7	.3	.0	.9	.3	.3
Size D - Nonmetropolitan (less than 50,000)	M	160.6	160.6	160.4	160.6	2.0	.0	.1	2.0	-.1	-.1
West urban	M	160.7	160.9	161.5	161.8	1.6	.6	.2	1.4	.5	.4
Size A - More than 1,500,000	M	159.7	160.0	160.5	160.7	1.9	.4	.1	1.6	.5	.3
Size B/C - 50,000 to 1,500,000 [3]	M	102.3	102.5	102.8	103.3	1.0	.8	.5	.7	.5	.3
Size classes											
A [5]	M	146.4	146.6	147.0	147.0	1.7	.3	.0	1.6	.4	.3
B/C [3]	M	101.9	102.0	102.4	102.4	.9	.4	.0	.9	.5	.4
D	M	158.3	158.7	158.9	159.1	1.4	.3	.1	1.4	.4	.1
Selected local areas[6]											
Chicago-Gary-Kenosha, IL-IN-WI	M	159.6	159.6	160.0	159.9	1.7	.2	-.1	2.0	.3	.3
Los Angeles-Riverside-Orange County, CA	M	156.1	156.1	156.8	157.0	1.4	.6	.1	.9	.4	.4
New York-Northern N.J.-Long Island, NY-NJ-CT-PA	M	169.7	169.9	170.5	170.5	1.5	.4	.0	1.4	.5	.4
Boston-Brockton-Nashua, MA-NH-ME-CT	1	-	169.9	-	171.5	2.2	.9	-	-	-	-
Cleveland-Akron, OH	1	-	153.3	-	152.8	2.5	-.3	-	-	-	-
Dallas-Fort Worth, TX	1	-	154.3	-	153.8	-	-.3	-	-	-	-
Washington-Baltimore, DC-MD-VA-WV [7]	1	-	102.7	-	102.2	1.8	-.5	-	-	-	-
Atlanta, GA	2	159.1	-	159.2	-	-	-	-	-	.1	-
Detroit-Ann Arbor-Flint, MI	2	155.1	-	155.7	-	-	-	-	2.2	.4	-
Houston-Galveston-Brazoria, TX	2	146.1	-	146.9	-	-	-	-	.4	.5	-
Miami-Fort Lauderdale, FL	2	158.0	-	158.6	-	-	-	-	-	.4	-
Philadelphia-Wilmington-Atlantic City, PA-NJ-DE-MD	2	167.9	-	169.3	-	-	-	-	1.5	.8	-
San Francisco-Oakland-San Jose, CA	2	162.7	-	163.4	-	-	-	-	2.4	.4	-
Seattle-Tacoma-Bremerton, WA	2	163.8	-	164.9	-	-	-	-	-	.7	-

[1] Foods, fuels, and several other items priced every month in all areas; most other goods and services priced as indicated:
M - Every month.
1 - January, March, May, July, September, and November.
2 - February, April, June, August, October, and December.

[2] Regions defined as the four Census regions. See map in technical notes.

[3] Indexes on a December 1996=100 base.

[4] The 'North Central' region has been renamed the 'Midwest' region by the Census Bureau. It is composed of the same geographic entities.

[5] Indexes on a December 1986=100 base.

[6] In addition, the following metropolitan areas are published semiannually and appear in Tables 34 and 39 of the January and July issues of the CPI Detailed Report: Anchorage, AK; Cincinnati-Hamilton, OH-KY-IN; Denver-Boulder-Greeley, CO; Honolulu, HI; Kansas City, MO-KS; Milwaukee-Racine, WI; Minneapolis-St. Paul, MN-WI; Pittsburgh, PA; Portland-Salem, OR-WA; St. Louis, MO-IL; San Diego, CA; Tampa-St. Petersburg-Clearwater, FL.

[7] Indexes on a November 1996=100 base.

- Data not available.

NOTE: Index applies to a month as a whole, not to any specific date.

NOTE: Local area indexes are byproducts of the national CPI program. Each local index has a smaller sample size than the national index and is, therefore, subject to substantially more sampling and other measurement error. As a result, local area indexes show greater volatility than the national index, although their long-term trends are similar. Therefore, the Bureau of Labor Statistics strongly urges users to consider adopting the national average CPI for use in their escalator clauses.

WORKBOOK

Table of Contents

Note: The chapters in the *Manual* and the *Workbook/Answer Key* are numbered independently of each other; i.e., Workbook chapter III does not necessarily correspond with Manual chapter III.

Chapter I:
Calculating Percents

Introduction

A percent expresses the relationship between a part and its whole. The word percent literally means "of each one-hundred." Thus the whole, by being designated 100%, becomes a benchmark against which all the parts can be easily measured.

1. All that is required to calculate percentages is that the part be divided by its whole. This process yields a decimal which may be converted to a percent by multiplying it by 100. This simply has the effect of moving the decimal point two places to the right. For example, if a professional baseball team won 81 games last season, out of a of total of 162 games played, the percentage of games won during the entire season is 50.0%:

a. Total games won (the part): 81

b. Total games played (the whole): 162

c. Percent of total games won: 50.0%

81÷162 =.500
.500 x 100 = 50.0%

2. In addition to stating the relationship between a part and its whole, percentages can also be used as a basis for salary comparisons. For example, if fire fighters in Boston are paid $43,315 per year while fire fighters in Cleveland are paid $34,574 per year, it can be said that fire fighters in Cleveland are receiving a salary that is 79.8% of that received by fire fighters in Boston.

a. Fire fighters' salary in Cleveland (the part): $34,574

b. Fire fighters' salary in Boston (the whole): $43,315

c. Fire fighters' salary in Cleveland as a percent of fire fighters' salary in Boston: 79.8%

$34,574 ÷ $43,315 = .798
.798 x 100 = 79.8%

As indicated by the above calculation, the fire fighters' salary in Cleveland is being compared to the salary received by fire fighters in Boston. Since, the Boston salary of $43,315 is the standard, (or benchmark), against which the Cleveland salary is being measured, it is considered to be 100%.

The relevance of performing the above statistical exercise becomes immediately clear if one were also to find that the relative salary positions of other municipal occupations in Cleveland compared to their counterparts in Boston are higher than 79.8 percent.

On the other hand, if the Boston salary were to be compared to that of Cleveland, the Cleveland salary would become the benchmark or 100%. Hence, Boston's $43,315 salary would be 125.3% of,(or 25.3% higher than), Cleveland's $34,574:

a. Fire fighters' salary in Boston (the part): $43,315

b. Fire fighters' salary in Cleveland (the whole): $34,574

c. Fire fighters' salary in Boston as a percent of fire fighters' salary in Cleveland: 125.3%

$43,315÷$34,574 = 1.2528
1.2528 x 100 = 125.28 or 125.3%

3. In the above answer, the division process has carried the figure out to several places after the decimal point. This was done in order to highlight the methodology involved in rounding. Most of the problems, as well as the answers, in this workbook have been rounded to the nearest tenth of a point, (carried to only one place after the decimal point).

In arriving at the final answer in the above calculation, the figure 125.28% was rounded to 125.3%. When rounding to the nearest tenth of a point, a number is rounded up if the second figure after the decimal point is 5 or more, (i.e., 125.28% becomes 125.3%). On the other hand, if the second number after the decimal point in the answer had been less than 5, then the figure would have been rounded down to the nearest tenth of a point, (i.e., 125.24% becomes 125.2%).

4. The process in ascertaining what a given percentage is of some number involves multiplication. For example, if asked to determine what 7.5% of $10,000 is, it would be necessary to multiply $10,000 by the decimal form of 7.5%, (.075 x $10,000). The answer is $750.

As shown above, the percent figure must be converted to its decimal form before the multiplication is performed. This conversion is readily accomplished by moving the decimal point in the percent figure two places to the left.

When the figure is 9.9% or less, the only way this conversion can be accomplished is by inserting a zero, as was done in converting 7.5% to .075.

Problems

1. During the 1996 season a quarterback completed 150 passes out of 300 total attempts. What percentage of his total passes were completed?

*Answer:*_____

2. In its most recent hearings, the city council announced the budget for the upcoming year. The budget for the public safety departments would be $538,000, while the total city budget for all departments, (including public safety), would be $11,000,000. What percent of the total city budget will go to public safety?

*Answer:*_____

3. In a recent election for mayor the winning candidate received 11,350 votes while his opponent received 8,800 votes. What percent of the total votes did the winning candidate receive?

*Answer:*_____

4. How much is 100% of 10,000?

*Answer:*_____

5. What number is 100% greater than 10,000?

*Answer:*_____

6. How much is 25% of 10,000?

*Answer:*_____

7. What number is 25% greater than 10,000?

*Answer:*_____

8. What number is 125% of 10,000?

*Answer:*_____

9. In 1996 Chicago paid its fire fighters $39,466 per year, while in New York City a fire fighter's salary was $48,873 per year. What was the Chicago fire fighter's salary as a percent of the New York City fire fighter's salary?

*Answer:*_____

10. Using the data presented in Problem #9, it can be said that the New York City fire fighter's salary is 123.8% of, (or 23.8 percent greater than), the salary of the Chicago fire fighter.

Answer: True _____ False _____

11. The data presented below are the 1996 salaries of bus operators and fire fighters. Compute the bus operator's salary as a percent of the fire fighter's salary showing your answers in the blank spaces in column (3).

	(1) Bus Operator	*(2) Fire Fighter*	*(3) (1) as a % of (2)*
Denver	$34,563	$36,846	_____
Houston	$37,576	$35,783	_____
Atlanta	$32,987	$34,365	_____

Chapter II:

Percentage Change

Introduction

The formula used to compute either a percent increase or a decrease is:

percent change = (amount of change) ÷
(figure from which change has occurred) x 100.

For example, if your salary increased from $20,000 in 1986 to $30,000 in 1996, the percent change in your salary over this period of time was 50.0%.

1. Salary in 1986: $20,000
2. Salary in 1996: $30,000
3. Amount of change, 1986–96:
   $30,000 - $20,000 = $10,000
4. Figure from which change occurred:
   $20,000
5. Amount of change divided by figure from which change occurred: $10,000÷$20,000 = .5
6. Percent change, 1986–96: .5 x 100 = 50.0%

The above percentage change could have also been determined through use of a shortcut method:

1. $30,000 ÷ $20,000 = 1.50
2. 1.500 - 1.000 = .5
3. .5 = 50.0%

While either method of computing percent change is correct, the user should employ the method with which he or she is most comfortable.

Problems

1. In 1992 a city employed 50 public safety workers. By 1996 that number had increased to 250. What was the 1992–96 percentage increase?

*Answer:*_____

2. The rate of pay for drivers was $10.50 per hour in 1992 and $13.60 per hour in 1996. Calculate the percent change in the driver's hourly rate of pay between 1992 and 1996.

*Answer:*_____

3. The formula used to compute a percentage increase is:

percent change = (amount of change) ÷
(figure from which change has occurred) x 100.

While this formula is used to compute percent increase, it can also be used to compute percentage decrease.

Answer: True____ False_____

4. A shortcut method for computing the percentage change in the driver's salary presented in Problem #2 would be to divide $13.60 per hour by $10.50 per hour and then subtract 1.00 from the resulting answer. This procedure would produce a figure which could then be converted into a percent by moving the decimal point two places to the right and placing a percent sign at the end.

Answer: True _____ False _____

5. The rate of pay for building inspectors was $10.25 per hour in 1993 and $10.00 per hour in 1995. Can the percent decrease in the inspectors' rate of pay be determined by using the shortcut method for computing percentage change?

Answer: Yes _____ No _____

6. The Consumer Price Index (1982–84=100) stood at 150.3 in January of 1995. However, by July 1995 the index was 152.5. What was the percent change in the CPI during that 6 month period?

*Answer:*_____

7. The annual salary for step 1 privates was $30,000 in 1991, $32,000 in 1993, and $33,500 in 1996. Calculate the percent increase in the step 1 privates' salary for:

a. the period 1991–1993

b. the period 1993–1996.

Answer: (a) _____ (b)_____

8. Recent collective bargaining negotiations have yielded a $.55 per hour wage increase for paramedics out of the county hospital. The paramedics hourly rate just prior to negotiations was $10.45. Calculate the percentage wage increase this group negotiated.

*Answer:*_____

9. In Problem #7, it was found that the step 1 privates' salary had increased during the periods 1991–1993 and 1993–1996 by 6.7% and 4.7% percent, respectively. Can we conclude from these figures that the percent increase over the full period 1991–1996 was 11.4%, which may be found by simply adding together the percent increase for 1991–1993 and 1993–1996?

Answer: Yes ____ No _____

10. In Corpus Christi, the average number of alarms per week was 30 in 1990, 40 in 1993 and 35 in 1996. Calculate the percent change for:

a. the period 1990–1993

b. the period 1993–1996

c. the period 1990–1996

Answer: (a) _____ (b) _____ (c) _____

11. When computing a percent decrease, we indicate the fact that it is a decrease by placing a minus sign (-) in front of the figure.

Answer: True _____ False _____

12. Recent collective bargaining negotiations have yielded a 7.0% increase for a unit of fire fighters. The employees' hourly rate just prior to negotiations was $9.41 per hour. Calculate the unit's new hourly rate.

*Answer:*_____

Chapter III:
The Mean and the Median

Introduction

The mean and median are measures of central tendency. They are single figures which are representative, (or descriptive), of an entire set of data containing many different individual numbers.

A. MEAN

The mean, (commonly known as the average), is the sum of the values of all the items in a set of data, divided by the total number of individual items in the set.

Example:	A	B
	25	5
	5	5
	10	10
	8	8
	7	—
	55	28
Mean:	55÷5=11	28÷4=7

Notice the difference between the averages produced in the two examples. This wide difference is due to the presence of the large number of 25 in example A. Extremely high or low values can greatly influence the the mean.

B. MEDIAN

The median, unlike the average, is not unduly influenced by extreme values. It is the mid-point, (or middle item), in any array of data arranged in sequence from the highest value to the lowest value, (or lowest to highest). Being the mid-point, the median is that point in the array where there are as many values above it as there are below. Locating the median for an array in which there is an odd number of items entails nothing more than simply finding the middle item. However, if there are an even number of items in the array, there is no visible middle item. In such a situation the median is determined by averaging the two middle items in the array.

Example:	A	B	
	25		
	10	10	
(midpoint)	8	8	(midpoint is
	7	5	between 8 and 5)
	5	5	
Median:	8	6.5	((8 + 5) ÷ 2)

C. WEIGHTED AVERAGE

The simple average, (or mean), referred to in (a) above, is a statistical technique which gives equal emphasis to each item in the set of data. The weighted mean, on the other hand, recognizes the fact that some items may be relatively more or less significant than others. When performing the calculation of a weighted average, this recognition of each item's degree of importance is accomplished. For example, if a local school system employs a total of ten teachers, what is the average salary received by a teacher, if five teachers are paid $30,000, three receive $29,000, and two receive $28,000?

The average of $30,000, $29,000 and $28,000 would produce an average salary of $29,000. However, this is not an accurate answer. By performing the calculation in this manner, each salary level has been given an equal weight. That is, the $30,000 salary is assumed to have no more significance in the computation than the $29,000 and $28,000 salaries—even though five of the ten teachers received $30,000, three teachers $29,000, and the remaining two teachers $28,000. If the three salary levels were weighted by the number of teachers receiving those salaries, a true picture of the average salary paid to the teachers would emerge:

$30,000	x	5	=	$150,000
$29,000	x	3	=	87,000
$28,000	x	2	=	56,000
		10		$293,000

To determine the weighted average, you must divide by the total number of items or in this case by a total of 10 teachers. Thus, the weighted average salary of our 10 teachers would be $29,300, ($293,000 ÷ 10).

Problems

1. The 1996 annual salaries for privates in five comparable municipalities were $37,123, $38,393, $33,533, $34,881, and $34,574. Calculate the average private's annual salary for the five cities.

*Answer:*_____

2. Using the data presented in Problem #1, find the median annual salary for the privates.

*Answer:*_____

3. Assume two additional private's salaries are added to those presented in Problem #1, thus producing a total of seven annual salaries. They are as follows: $37,123, $38,393, $33,533, $34,881, $34,574, $32,129, and $40,626. Calculate the average of these seven salaries.

*Answer:*_____

4. Is the median of the seven salaries presented in Problem #3 different than the median of the five salaries shown in Problem #1 ?

Answer: Yes _____ No _____

5. Collective bargaining negotiations in 1996 have yielded salary increases for eight of your city's unions. They are 5.5%, 5.9%, 8.0%, 6.6%, 8.6%, 7.8%, 6.0% and 9.0%. Calculate the median percent increase received by the eight groups.

*Answer:*_____

6. While the average is sometimes distorted by extremely high or low values, this is not so with the median.

Answer: True _____ False _____

7. The hourly rates of pay for lieutenants in a selection of cities are:

$9.50, $10.25, $9.01, $8.75, $9.15, $11.00, $10.76, $9.50, $8.50, $9.30, $9.50, $8.26, $10.00, and $10.50.

Calculate:

a. the average, (mean), hourly rate

b. the median hourly rate

Answer: **a.** _____ **b.** _____

8. The average, (mean), of any series of numbers is found by adding together the values of all the items in the series, and then dividing the resulting total by the total number of individual items.

Answer: True _____ False _____

9. Listed below are the 1991 and 1996 maximum salaries without longevity for fire fighters in cities with populations of one million or more.

Maximum Salary without Longevity

City	*1991*	*1996*
New York	$31,425	$38,458
Chicago	32,400	36,888
Los Angeles	31,668	38,808
Philadelphia	29,329	35,022
Detroit	31,800	38,292

Calculate the average salary for both 1991 and 1996.

Answer: 1991: _____ 1996:_____

10. Using the data in Problem #9, which of the cities represents the median fire fighter's salary in 1991 and which of the cities represents the median fire fighter's salary in 1996?

Answer: 1991:____ 1996: ____

11. Replace the question mark with the number that will allow you to obtain an average of 24:

(20 + 15 + 45 + 30 + 16 + 18) ÷ ? = 24

*Answer:*_____

12. In order to find the median in an array of data having an even number of items, one should…

a. average the values of the two middle items.

b. pick the middle item in the array after dropping off the lowest value.

c. conclude that the median can't be located for an array in which there is an even number of items.

*Answer:*_____

13. The mean and the median are statistical measures that are used to arrive at a single figure which is said to be descriptive of an entire set of data.

Answer: True _____ False _____

14. The average annual percent change over a five year period is the total percent change over the period divided by five.

Answer: True _____ False _____

15. Assume that the salaries of a group of forest fire fighters increased during the period 1989–1991 by 34.2%, and further increased by 28.1% during the period 1991–1996. Calculate the average annual percent change for each of the two periods.

Answer: 1989–1991 _____ 1991–1996 _____

16. If we are told that the percent increase in the Consumer Price Index over the last 12 months was a total of 9.0%, what was the average percent increase per month?

*Answer:*_____

17. The median is the midpoint in any set of data arranged from high to low. In essence, it is located at the point where the same number of items are above it as below it.

Answer: True _____ False _____

18. Listed below are the classifications and annual salaries for a unit of fire fighters. Given this information, calculate the unit's weighted average salary:

Classification	Number of Employees	Annual Salary
Private step 1	20	$23,530
Private step 2	15	24,180
Private step 3	3	29,235
Driver	4	25,360
Lieutenant	2	28,910
Captain	5	30,518

*Answer:*_____

19. Consider the data in the table below, and then calculate the unit's weighted average salary.

Classification	Number of Employees	Annual Salary
EMT 1		
1st Step	5	$27,130
2nd Step	20	27,537
3rd Step	13	27,963
EMT 2		
1st Step	11	28,349
2nd Step	19	28,816
3rd Step	33	29,308
Paramedic		
1st Step	10	29,751
2nd Step	18	30,289
3rd Step	25	30,853

*Answer:*_____

20. Consider the data presented below involving settlements of two collective bargaining units. Both agreements are for two years and provide for two deferred wage increases in addition to the initial wage increase.

	Unit A	Unit B
Hourly wage rate as of 12/31/94	$11.00	$10.85
Duration of new agreement	24 months	24 months
Hourly wage increases:		
effective 1/1/95	$.10	$.25
effective 1/1/96	$.30	$.05
effective 7/1/96	$.10	$.15

It is readily apparent that by the end of the contract period Unit A's hourly rate will be $11.50 compared to Unit B's $11.30. Hence, the differential in favor of Unit A will grow from $.15 per hour to $.20 per hour. However, consider the values of the increases over the lives of the two contracts. Can you reach the conclusion that Unit B has negotiated the better deal?

*Answer:*_____

Chapter IV:

Average Percent Change vs. Growth Rate

Introduction

The problems in this chapter require the use of compound growth rates. An explanation of how growth rates work, and a series of growth rate tables appear in Appendix A of this workbook.

Problems

1. Assume that you have a jointly administered pension program. At the last meeting of the city council it was decided that the fund should invest its money in a savings bank paying 5.5% interest compounded annually. What would be the total percent increase in the fund if the money were left in the bank for five years and no withdrawals or deposits to the fund are made?

*Answer:*_____

2. Assume that between 1989 and 1995, the salary for fire inspectors increased by 26.5%. What was the annual rate of increase in the fire inspectors' salary?

(See Growth Rate Tables in Appendix A to determine your answer).

*Answer:*_____

3. If your 1996 salary of $30,000 per year were to be increased at an annual rate of 6.5% over the next 15 years, what would your salary be in 2011?

(See Growth Rate Tables in Appendix A)

*Answer:*_____

4. Assume that the local teachers' union has just signed a three year contract providing three annual increases that average 8.0% per year. The fire fighters' local has also signed a three year contract which provides that the wage will increase at a rate of 7.8% per year for each of three years. Which local union—the teachers' or fire fighters'—will receive the largest total percent increase by the end of the three year period?

*Answer:*_____

5. During the period 1989–1996, the Consumer Price Index increased 30.1%. Calculate:

a. the average annual increase

b. the annual rate of increase

(See Growth Rate Tables in Appendix A, if necessary)

Answer: **a.** _____ **b.** _____

6. The data presented below are the annual salaries of drivers covering the period 1991–1996.

Year	***Annual Salary***
1991	$32,000
1992	33,152
1993	34,080
1994	35,205
1995	36,367
1996	36,736

Calculate:

a. the average annual percent increase for 1991–1994

b. the annual rate of increase for 1991–1994

c. the annual rate of increase for 1991–1996

(See Growth Rate Tables in Appendix A)

Answer: **a.**_____

b._____

c._____

Chapter V:
Salary Comparisons

Introduction

Salary comparisons are useful in collective bargaining to determine a unit's standing vis-a-vis other collective bargaining units. The problems in this chapter require the use of measurements dealt with in prior workbook chapters, such as calculating one salary as a percent of another salary, using the mean and the median, and computing percent change.

Problems

1. In 1990, the bus operator salaries in ten comparable cities were: Atlanta $25,830, New Orleans $26,920, Phoenix $26,300, Washington, D.C. $28,130, Philadelphia $27,570, Dallas $24,840, Milwaukee $27,235, St. Paul $26,425, Cleveland $26,100 and Miami $24,450. Array these data and calculate the average and median salary for bus operators in these ten cities in 1990.

Answer: Average _____ Median _____

2. In 1996, the bus operator salaries in the ten cities cited in Problem #1 above were: New Orleans $30,920, Washington, D.C. $32,130, Dallas $28,840, Cleveland $30,100, Miami $28,450, St. Paul $30,425, Philadelphia $31,570, Milwaukee $31,235, Atlanta $29,830, Phoenix $30,300. Array these data, and calculate the average and median salary paid to operators in these 10 cities for 1996

Answer: Average _____ Median _____

3. Using the answers you derived for Problems #1 and #2, calculate the percent increase in the average of the bus operator salaries in the ten cities.

*Answer:*_____

4. Using the answers you derived for Problems #1 and #2, calculate the percent increase in the median bus operator salary for the ten cities.

*Answer:*_____

5. Below are listed the 1990 salaries of bus operators and fire fighters in ten cities. Fill in the appropriate figures in the blank spaces in column (3).

	(1) ***1990 Bus Operator Salaries***	***(2)*** ***1990 Fire Fighter Salaries***	***(3)*** ***(1) as % of (2)***
Washington, D.C.	$28,130	$28,650	98.2 %
Philadelphia	27,570	28,380	____%
Milwaukee	27,235	28,150	96.7 %
New Orleans	26,920	27,250	____%
St. Paul	26,425	26,425	____%
Phoenix	26,300	27,000	____%
Cleveland	26,100	27,535	94.8 %
Atlanta	25,830	26,780	____%
Dallas	24,840	26,240	94.7 %
Miami	24,450	25,560	95.7 %

Answer: Average _____ Median _____

6. In the following table the 1996 salaries of bus operators and fire fighters are listed for the same ten cities as appeared in Problem #5. Fill in the appropriate figures in the blank spaces in column (3).

	(1) ***1996 Bus Operator Salaries***	***(2)*** ***1996 Fire Fighter Salaries***	***(3)*** ***(1) as % of (2)***
Washington, D.C.	$32,130	$32,650	____%
Philadelphia	31,570	32,380	97.5 %
Milwaukee	31,235	32,150	____%
New Orleans	30,920	31,250	98.9 %
St. Paul	30,425	30,425	100.0 %
Phoenix	30,300	31,000	____%
Cleveland	30,100	31,535	____%
Atlanta	29,830	30,780	96.9 %
Dallas	28,840	30,240	____%
Miami	28,450	29,560	96.2 %

Answer: Average _____ Median _____

7. Using the data in Problems #5 and #6, what is the change in percent for the ten city average from 1990 through 1996?

*Answer:*_____

8. Using the data in Problems #5 and #6, what is the change in percent for the ten city median from 1990 through 1996?

*Answer:*_____

9. Consider the data presented in the table below. Calculate and fill in the appropriate figures in the blank spaces in columns (4), (7), and (8).

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Bus Operator Salary		Total Percent Increase	Effective Dates*		Number of	Avg. Monthly
	1990	1996	1990–96	1990	1996	Months	% Increase
Washington, D.C.	$28,130	$32,130	____%	Dec.	Jan.	61	0.23%
Philadelphia	27,570	31,570	14.5 %	Jul.	Jan.	66	0.22%
Milwaukee	27,235	31,235	____%	Aug.	Dec.	____	____%
New Orleans	26,920	30,920	____%	Dec.	Jan.	____	____%
St. Paul	26,425	30,425	15.1 %	Apr.	Aug.	____	____%
Phoenix	26,300	30,300	15.2 %	Dec.	Jan.	61	0.25%
Cleveland	26,100	30,100	____%	Jan.	Dec.	____	0.18%
Atlanta	25,830	29,830	15.5 %	Jan.	Jul.	78	____%
Dallas	24,840	28,840	____%	May	Nov.	____	____%
Miami	24,450	28,450	16.3 %	Jan.	Dec.	83	0.20%

* Assume the effective date is the first day of the given month.

Chapter VI:

The Consumer Price Index (CPI)

Introduction

The BLS Consumer Price Index is a statistical series which measures the change in consumer prices. The base year currently used for the CPI is the years 1982–84, at which point the level of consumer prices is considered to equal 100.0 index points. Changes in actual prices are converted into their equivalents in index points to provide the basis for each monthly, (or annual average), index figure.

In the past, other years, such as 1957–59 and 1967, have also been used as base years. Changing the base year does not affect the amount of price change reflected by the index. Shifting the base year merely produces a measuring rod of a different calibration — like measuring distance in meters and yards. Regardless of which scale is used, meters or yards, a high jump of 7 feet is still 7 feet.

The method of computing percentage changes in the Consumer Price Index is exactly the same as that used to solve the problems in Workbook, Chapter 2 (Percent Change). That method is:

Percent change equals the *amount of change* (in index points) divided by the *index from which the change occurred,* with the resulting figure multiplied by 100.

It should be noted that this formula cannot be shortened by simply subtracting one index number in the series from another. Such a procedure yields only the amount of change in index points, not the percent change. In other words, a one point change in the index does not equal a one percentage point change. The only time a one point change in the index does equal a one percent change in the index is when the change is being measured from the base period of 100 to some subsequent point in time.

Problems

1. Below is a table presenting the Consumer Price Index (CPI) for the United States from 1983 to 1996.

Year	***Consumer Price Index 1982–84 as base year***
1983	99.6
1984	103.9
1985	107.6
1986	109.6
1987	113.6
1988	118.3
1989	122.6
1990	129.0
1991	134.3
1992	138.2
1993	142.1
1994	145.6
1995	149.8
1996	154.1

Calculate from these data the percent change in the CPI for the periods:

a. 1983–96 _____

b. 1983–88 _____

c. 1990–93 _____

d. 1992–96 _____

2. The average annual CPI's (1982–84 = 100) for 1995 and 1996 were 149.8 and 154.1, respectively. However, the monthly CPI (1982–84 = 100) for December of 1995 was 150.9, while the monthly index for December 1996 was 155.9. Calculate the percent change that occurred in the CPI for 1995 vs. 1996 by first using the average annual CPI's and then by using the CPI's for the month of December.

Answer: Using annual averages _____

Using months of December _____

3. The Bureau of Labor Statistics is currently using 1982–84 as the base year for the Consumer Price Index. However, the CPI's base year could just as easily have been designated as 1981 or 1985

Answer: True _____ False _____

4. Listed below are the average annual Consumer Price Indexes for the United States, Baltimore, and Boston for the period 1987 through 1996. The averages of the years 1982–84 is the base year.

Consumer Price Index

Year	***U.S.***	***Baltimore***	***Boston***
1987	113.6	113.8	117.1
1988	118.3	118.9	124.1
1989	122.6	124.1	131.5
1990	129.0	130.1	138.8
1991	134.3	135.6	144.6
1992	138.2	139.5	148.0
1993	142.1	142.3	152.1
1994	145.6	145.9	153.8
1995	149.8	149.7	157.4
1996	154.1	153.1	162.2

Determine, for each of the indexes, the percentage change for each of the following time periods:

	1987–96	1990–96
U.S.	_____%	_____%
Baltimore	_____%	_____%
Boston	_____%	_____%

5. Each index point change in the CPI is the equivalent to a one percentage point change. The only time this is not true is when we are measuring against the base period.

Answer: True _____ False _____

6. Below are listed the monthly U.S. Consumer Price Indexes for the year 1996. However, the CPI in column (2) has 1982–84 as its base year, while the CPI in column (3) has 1978 as its base year. Does this fact alter the percentage changes these two indexes would exhibit over similar periods of time? (A few calculations using both indexes over similar periods of time should be sufficient to draw a conclusion.)

(1)	***(2)***	***(3)***
Month	***1982–84 as the base year***	***1978 as the base year***
1/96	151.7	228.3
2/96	152.2	229.1
3/96	152.9	230.2
4/96	153.6	231.3
5/96	154.0	231.9
6/96	154.1	232.0
7/96	154.3	232.3
8/96	154.5	232.6
9/96	155.1	233.5
10/96	155.5	234.1
11/96	155.9	234.7
12/96	155.9	234.7

Answer: Yes _____ No _____

7. Using the data presented in Column 2 of Problem #6, measure the percent change in the CPI from June 1996 through September 1996.

*Answer:*_____

Chapter VII:
Measuring "Real" Income

Introduction

The conversion of current dollar amounts into their "real" or constant dollar values is achieved through the use of the Consumer Price Index. Using the index with 1982–84 as its base year, will convert current dollars into constant 1982–84 dollars. In other words,the amounts will be restated in terms of their buying power in 1982–84.

The conversion of current dollar salaries into "real" or constant dollars can be expressed as:

Constant dollar salary = (current dollar salary ÷ CPI) x 100

Assume that the Consumer Price Index rose from 122.6 points in 1989, to 154.1 points in 1996. This would result in an increase of 25.7%. Now, assume that the salary for a particular group of public employees advanced over the same time period from $21,000 per year in 1989 to $30,066 per year in 1996. The resulting percentage increase in their salaries would be 43.2%. At first glance, it might seem that the real salary increase over these years was 17.5%, (the difference between the 43.2% increase in salary and the 25.7% increase in the CPI). This, however, is not the case. Since they are two separate movements, the percent change in the CPI cannot be subtracted from the percent change in salaries.

To obtain the correct percentage increase, you need to convert the current dollar salaries to constant dollar salaries. The computation, using the formula above, would be as follows:

1989: ($21,000 ÷ 122.6) x 100 = $17,128.87

1996: ($30,066 ÷ 154.1) x 100 = $19,510.71

Both salaries are now on a common scale and the real salary gain can now be computed. The percent change in the constant dollar salaries is 13.9%.

The formula for converting constant dollar salaries back into current dollars is simply the reverse of the above formula:

Current dollar salary = (constant dollar salary x CPI) ÷ 100.

Problems

1. The annual salary for a Private 1 was $27,000 per year in 1989, when the Consumer Price Index (1982–84=100) was 122.6. By 1996, the Private 1 salary had risen to $33,000 per year and the CPI (1982–84 = 100) stood at 154.1. Calculate the constant dollar salary, (in terms of 1982–84 dollars), for both 1989 and 1996

Answer: 1989 _____ 1996 _____

2. Having calculated the constant dollar salary for 1989 and 1996 for the Private 1, calculate the real percentage change over the period.

*Answer:*_____

3. The hourly rate for arson investigators was $9.25 per hour in 1988, while the Consumer Price Index (1978 = 100) was 178.4. In 1996, the hourly rate was $11.50 and the CPI (1982–84=100) was 154.1. Given this information, can the arson investigator's 1988 and 1996 rates be converted to 1982–84 dollars?

Answer: Yes _____ No _____

4. During the five year period 1991–96, the salary paid to paramedics increased by 40.0 percent. The corresponding increase in the CPI was 18.8%. Thus, the real percent increase in the paramedics' salary over the five year period was 22.2%, (40.0% - 18.8%).

Answer: True _____ False _____

5. Find the constant dollars salaries for each year listed below, using the CPI with the averages of 1982–84 as its base year.

Year	Annual Salaries	U.S. CPI 1982–84 as base year	Salary in 1982–84 Dollars
1986	$27,000	108.6	_____
1987	28,000	112.5	_____
1988	29,000	117.0	_____
1989	30,000	122.6	_____
1990	31,000	129.0	_____
1991	32,000	134.3	_____
1992	33,000	138.2	_____
1993	34,000	142.1	_____
1994	35,000	145.6	_____
1995	36,000	149.8	_____
1996	37,000	154.1	_____

6. When measuring the trend in real salaries, the first step is to convert actual salaries into constant dollars by using the Consumer Price Index. This is done so that…

(a) all of the annual salaries will be in terms of dollars that reflect the same purchasing power.

(b) the current dollar salaries are adjusted for inflation.

(c) both (a) and (b).

*Answer:*_____

7. Using problem #5, find the percent change of the constant dollar salaries for the period 1994–96.

*Answer:*_____

8. Suppose that the annual salaries of lieutenants in both New York City and Chicago were $35,150 in 1988 and $45,000 in 1996. The 1988 CPI for both New York City and Chicago was 119.7. However, by 1996 the New York City CPI stood at 158.0, while the Chicago CPI was 156.8. Given this information calculate the constant dollar salaries for 1988 and 1996, and then compute the real percentage gain for both cities.

Answer:

	New York City	Chicago
1988	$ _____	$ _____
1996	$ _____	$ _____
Percent Change:	_____%	_____ %

Chapter VIII:
Urban Family Budgets

Introduction

The AFL-CIO publishes an updated version of the Urban Family Budgets for the United States and 25 individual cities. The published budgets show how much it costs a family of four to live at three different living standards—at a lower budget level, an intermediate level, and a higher level. Each standard has been carefully constructed to include a wide range of goods and services, as well as federal, state, and local taxes.

Since the "market basket" of goods and services that make up each of the three budgets is kept constant from one year to the next, the budget data is able to indicate the amount of income required by a family in order to maintain a fixed standard of living from one year to the next. The income required to enjoy the living standard rises each year because, among other reasons, prices increase. But the living standard remains unchanged. Consequently, these Urban Family Budgets are useful benchmarks against which to gauge the meaning—in terms of improvement in living standards—of changes in pay over any period of time. In order to do this, the salary for each year is taken as a percentage of the budget for each year. This will show how the salary has been moving relative to that fixed living standard. As was demonstrated earlier in this workbook, in order to perform such a computation, the salary is divided by the budget, and the resulting figure multiplied by 100.

It should be noted that, since the AFL-CIO revises the national budget monthly and the individual city budgets yearly, the latest data may be somewhat out of date at the time the user needs them. This will be particularly true during periods of rapidly rising prices.

Problems

1. In 1990, your salary was $30,000 per year, and the U.S. Intermediate Urban Family Budget was $32,719. Calculate your salary as a percentage of the budget for 1990.

*Answer:*_____

2. Assume that your 1995 salary was $38,915 per year. The U.S. Intermediate Urban Family Budget was $38,192 in 1995. Calculate your salary as a percentage of the budget for 1995.

*Answer:*_____

3. Use your answers to Problems #1 and #2 and consider 1990 as a baseline. What happened to your salary compared to the Urban Family Budgets between 1990 and 1995?

*Answer:*_____

4. One prominent advantage in comparing salaries to the Urban Family Budgets over time, is the fact that, unlike the Consumer Price Index, the budgets take into account federal, state, and local income taxes. However, its most serious flaw is that the budget is officially updated only once a year, and therefore may be outdated at the point in time when a new contract is being negotiated.

Answer: True ____ False ____

5. The data presented below show the annual salaries for Emergency Medical Technicians in New York City during the period 1991–95. The intermediate Urban Family Budget are also presented. Fill in the appropriate figures in the blank spaces, showing each salary as a percent of the budget.

Year	***Annual Salary***	***Intermediate Family Budget***	***Salary as a Percent of Budget***
1991	$33,000	$40,718	_____
1992	$33,500	$42,886	_____
1993	$34,000	$44,153	_____
1994	$35,000	$45,132	_____
1995	$36,000	$46,236	_____

6. As can be seen from your answers to Problem #5, the salary as a percent of the budget declined from 1991 to 1995. What 1995 salary would be necessary in 1995 in order to reestablish the 81.0% salary-to-budget relationship that existed in 1991?

*Answer:*_____

Chapter IX:
Cost of Living Escalator Clauses

Introduction

Cost-of-living escalators are a means of protecting the purchasing power of the employee's negotiated wage or salary against the inflation which may occur during the life of the collective bargaining agreement. Some groups accomplish this by providing for percentage adjustments in each individual's wage or salary that are equal to the percentage change in the CPI. Others use a formula which establishes a ratio between the unit's average straight-time wage or salary and the CPI, (such as, one-cent for each 0.3 of a point change in the CPI).

In the latter case, the formula is determined by dividing the number of index points in the CPI by the unit's average pay rate that the escalator clause seeks to protect—which usually means the salary that has been newly negotiated at the time the escalator clause becomes effective. If the cost-of-living adjustment is to be based on the hourly rate of pay, the resulting formula will be expressed in terms of cent-to-points. On the other hand, if the weekly rate of pay is to be the basis for adjustment, then the formula will be in terms of dollars-to-points, (such as, $1.25 for each index point change in the CPI).

Like any other provision in collective bargaining agreements, the details of an escalator clause are a matter for negotiations between the parties. Consequently, there are wide variations to be found in the design of escalator clauses with respect to the degree of purchasing power protection provided by the clause, the frequency of adjustments, limitation on the amount of the adjustment, incorporation of the escalator money into the base rates, and other variations.

Problems

1. You have just negotiated a new three year collective bargaining agreement, effective January 1996, which includes an escalator clause. Your new wage rate under the first year of the agreement is $7.50 per hour and the December 1995 CPI (1982–84 = 100) is 150.9. Calculate the appropriate cents-to-points ratio that should be the basis of your escalation formula.

*Answer:*_____

2. The Consumer Price Index (1982–84=100) was 150.9, 152.9, 154.1, and 155.1 in December 1995, March 1996, June 1996, and September 1996, respectively. Using the cents-to-points formula you derived in Problem #1 and assuming that the contract states that the escalator amount will be figured from a December 1995 base, calculate the cumulative and incremental cost-of-living adjustments that would be due for each of the quarters ending in March, June and September 1996.

Answer:
March 1996: _____
June 1996: _____
September 1996: _____

3. Assume that your collective bargaining agreement had an escalator clause which provided quarterly payments of 1¢ for every 0.3 points increase over and above the December 1995 CPI (1982–84 = 100). However, the clause also states that the maximum COLA payment will be no more than 9¢ per hour in any one calendar year. The December 1995 CPI was 150.9, while the March and June 1996 CPI's were 152.9 and 154.1, respectively. Calculate the cost-of-living adjustments due in March 1996 and June 1996.

Answer: March 1996: _____

June 1996: _____

4. Assume that between September and December 1996, the Consumer Price Index (1982–84 = 100) fell from 154.0 points to 152.5 points. The cents-to-points formula for your escalator clause is 1¢ for every 0.2 points change in the CPI. Calculate the amount of cents per hour decline.

*Answer:*_____

5. Your escalator provision calls for semi-annual cost-of-living adjustments based on percentage increases in the CPI. However, these payments are not triggered until the CPI has increased at least 5% in a given year. If the CPI during the first six months of 1996 rose by 6%, how much would your salary adjustment be? (Note that "triggered" usually means that the increase calculation begins after the specified CPI level has been reached.)

*Answer:*_____

6. A bargaining unit, which has a 40 hour workweek, is in the process of negotiating a cost-of-living escalator clause to be incorporated into its new contract. Its average hourly rate is $7.50 per hour. If the current month U.S. Consumer Price Index (1982–84 = 100) is 150.5, determine the appropriate cents-to-points ratio that should be the basis of the unit's cost-of-living escalator formula.

*Answer:*_____

7. Using the data in Problem #6 calculate the dollars-to-points formula that would be appropriate for an escalator clause based on a weekly salary rather than the hourly rate.

*Answer:*_____

8. If the Consumer Price Index (1982–84 =100) were to increase during the next three months by 4.0 index points, would the amount of the adjustment for the unit mentioned in Problems #6 and 7 be any different using the hourly formula as opposed to the weekly formula?

Answer: Yes _____ No _____

Chapter X:

Calculating Compensation Costs

Introduction

A unit's average compensation per employee is determined by dividing the total annual cost of wages and the total annual cost of all fringe benefit items by the total number of employees, (or by hours to obtain average compensation per hour). Typically, these total cost figures are readily available from the employer's payroll records, as would be the necessary data on employment and/or hours. However, for the purposes of the following questions, it is assumed that the total cost of wages and fringe benefits is not readily available, and that all there is to work with are data on the distribution of employees, (i.e., number of employees by occupation, and their years of service). Thus, the following problems require finding the weighted averages of the wages and each of the fringe benefit items—by either the number of employees receiving them, or by the number of hours for which they are paid—in order to arrive at their total cost.

The data on the distribution of employees together with other information needed to respond to the following questions, appear in Appendix B of this workbook.

Problems

1. Using the information for the Sample Bargaining Unit (SBU) provided in Appendix B, calculate the unit"s average straight-time hourly wage rate.

*Answer:*_____

2. Calculate the total annual dollar cost of the SBU's overtime premium.

*Answer:*_____

3. Calculate the total annual dollar cost of paid holidays for the SBU.

*Answer:*_____

4. Calculate the total annual dollar cost of paid vacations.

*Answer:*_____

5. Calculate the total annual dollar cost of the employers contribution for the SBU's hospitalization plan.

*Answer:*_____

6. Calculate the total annual dollar cost of the employer's contribution to the SBU's pension plan.

*Answer:*_____

7. Calculate the SBU's total annual number of hours worked.

*Answer:*_____

8. Based on your answers to Problems #1 through #8, calculate the SBU's total average hourly base compensation.

*Answer:*_____

9. How much will the unit's straight-time hourly rate be raised if the SBU negotiates an across-the-board increase of 7.0%?

*Answer:*_____

10. When calculating increases in average compensation costs, the cost of salary related fringe benefits must be rolled-up, (or increased), by the same percentage. The cost of those fringe benefits not linked to pay rates are not subject to this roll-up.

Answer: True _____ False _____

11. Given that the SBU's wage increase is 7.0%, calculate the increase in the unit's average hourly over-time premium costs.

*Answer:*_____

12. In addition to the 7.0% wage increase and other fringe benefits improvements gained by the SBU, the employer has also agreed to increase by $10 per month its contribution for family coverage under the hospitalization plan. As a result, what will be the increased average hourly cost of hospitalization?

*Answer:*_____

Appendix A:
Compound Growth Rate Tables

Guide to Using Compounded Growth Rate Tables

The following tables are used to calculate compound growth rates. The figures at the top of each column represent different percentage rates of change. The numbers 1 through 30 in the far left hand column, labeled "year", indicate the number of times the individual rates have been compounded. To determine the results of compounding any particular rate, simply locate the figure in the "rate" column—from 0.1% to 10.0%—that coincides with the appropriate number of years of compounding.

1. For example, the fifth figure down in the column labeled 3.0% is 1.15927. This simply indicates that compounding a number by 3.0% five times will increase that number by 15.93% (rounded). The figure "1" to the left of the decimal represents the original number that was compounded by 3.0% per year. Thus, as the following table shows, if $1.00 was placed in a savings account paying a 3.0% annual rate of interest, the amount of compounded interest at the end of five years would be $.159, (which is 15.9% of $1.00), and the total in the account would be $1.159, or $1.16.

Year	*Amount in Account at Beginning of Year*	*Annual Compound Interest Rate*	*Amount of Interest*	*Amount in Account at End of Year*
1	$1.0000	.03	$.0300	$1.0300
2	1.0300	.03	.0309	1.0609
3	1.0609	.03	.0318	1.0927
4	1.0927	.03	.0328	1.1255
5	1.1255	.03	.0338	1.1593
Total			$.1593	

2. As stated previously, the figures presented in the growth rate tables consist of two parts: (a) the original amount before compounding—represented by "1"—and (b) the amount of increase. The amount of increase is determined by subtracting 1. This is the case even when the number to the left of the decimal point is greater than 1. For example, the eighth figure down in the column labeled 10.0% is 2.143 (rounded). As the table below shows, if $1.00 was placed in a savings account paying a 10.0% annual rate of interest, that $1 at the end of eight years would be worth $2.143, (the original $1.00 plus $1.143 interest). This is 114.3% greater than the original $1.00 placed in the account.

Year	*Amount in Account at Beginning of Year*	*Annual Compound Interest Rate*	*Amount of Interest*	*Amount in Account at End of Year*
1	$1.000	.10	$.100	$1.100
2	1.100	.10	.110	1.210
3	1.210	.10	.121	1.331
4	1.331	.10	.133	1.464
5	1.464	.10	.146	1.610
6	1.610	.10	.161	1.771
7	1.771	.10	.177	1.948
8	1.948	.10	.195	2.143
Total			$1.143	

3. While the above examples show how the tables can be used to determine the total percent changes that will occur at different rates of growth, these tables can also be used in reverse. If, for instance, your salary grew over the last five years by 18.8%, it is a simple matter—with the aid of the tables—to determine the implied rate of growth. This 18.8% increase will appear in the tables as 1.188 (the original amount, represented by "1," increased by 18.8%) and is located as the fifth entry under the column labeled 3.5%. Thus, the implied rate of growth is 3.5%.

4. It should be noted that not all of your calculations will produce percent changes which will correspond exactly with the figures presented in the tables. For example, if the 18.8% used above had been 19.0% instead, would the rate of growth be 3.5% or 3.6%? The correct procedure would be to pick the rate which produces a figure that is closest to 19.0%. In this case, 19.0% is closest to 18.8%. Therefore, we would use 3.5% as the rate of growth.

Appendix B:
Description of Sample Bargaining Unit

The following is a description of salaries, fringe benefits, and working conditions for a hypothetical Sample Bargaining Unit of fire fighters. This information is to be used for working the problems in Chapter 10.

1. Employment and Salaries

Classification	***Number of Employees***	***Hourly Wage Rate***
Private		
Step 1	15	$11.10
Step 2	23	11.65
Step 3	32	12.20
Driver	24	12.80
Lieutenant	18	13.75
Captain	12	15.00

2. Scheduled Hours of Work

A 40-hour workweek is in place.

3. Pay for Overtime Hours

The overtime premium is one-half time, thus all overtime hours are paid for at the rate of time-and-one- half. The distribution of the unit's overtime hours worked in the previous year is as follows:

Classification	***Number of Overtime Hours***
Private - Step 1	785
Private - Step 2	1,046
Private - Step 3	997
Driver	443
Lieutenant	230
Captain	150

4. Vacations

Classification	***Number of Vacation Hours***
Private - Step 1	40
Private - Step 2	40
Private - Step 3	80
Driver	80
Lieutenant	96
Captain	96

5. Holidays

Each employee is entitled to nine (9) paid holidays at 12 hours leave per holiday.

6. Hospitalization

Type of Coverage	***Number of Employees***	***Employer's Monthly Contribution***
Single	13	$250.00
Family	77	$400.00

7. Pensions

The employer contributes 15 1/2% of payroll per week per employee to the Unit's pension fund.

ANSWER KEY

Table of Contents

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Exercises in Use of Tools and Techniques

Note: The chapters in the *Manual* and the *Workbook/Answer Key* are numbered independently of each other; i.e., Workbook chapter III does not necessarily correspond with Manual chapter III.

Chapter I:
Calculating Percents

Answers

1. The quarterback successfully completed 50.0 percent of his passes.

a. Number of passes completed (the part): 150

b. Number of total passing attempts (the whole): 300

c. Percent of total passing attempts completed: 50.0%

150 ÷ 300 = .500.

.500 x 100 = 50.0%

A percentage describes the relationship of a part to its whole. Standing by itself, the fact that the quarterback completed 150 passes really doesn't mean much. However, when it is put in the context of the total number of passes attempted its meaning is immediately clear. The 300 passes attempted is the total, and as such, it is 100 percent. If the quarterback had attempted only 200 or 250 passes instead of 300, they also would be 100 percent, because they would represent the whole. The 150 completed passes are, obviously, less than the total number attempted, and therefore, represent less than 100 percent. The question is, precisely how much less than 100 percent are they? The answer is determined by simply dividing 150, (the part), by 300, (the whole), which produces the decimal .500. This decimal may be translated into a percent by multiplying it by 100, which is readily accomplished by moving the decimal point two places to the right and adding the percent sign.

2. The proportion of the total city budget allocated to the public safety department is 4.9%. In this case, the $11,000,000 city budget is the whole, while the public safety department's budget of $538,000 is the part.

a. Public safety department's budget (the part): $538,000

b. Total city budget (the whole): $11,000,000

c. Public safety budget as percent of city budget: 4.9%

$538,000 ÷ $11,000,000 = .0489

.0489 x 100 = 4.89 or 4.9%

3. The winning candidate for Mayor received 56.3% of the total votes cast. In this case the whole is the total number of votes cast in the election. This is determined by finding the sum of the 11,350 votes received by the winner and the 8,800 votes received by the loser.

a. Votes received by winning candidate (the part): 11,350

b. Votes received by losing candidate: 8,800

c. Total votes cast (the whole): 11,350 + 8,800 = 20,150

d. Percent of total votes received by winning candidate: 56.3%

11,350 ÷ 20,150 = .563

.563 x 100 = 56.3%

4. 100% of 10,000 is 10,000. In order to make the computation, the percentage figure must convert back to its decimal form. This means moving the decimal point two places to the left. This procedure is just the opposite of converting a decimal to a percent, which is accomplished by moving the decimal two places to the right.

10,000 x 1.00 = 10,000

5. The number that is 100% greater than 10,000 is 20,000.

a. 10,000 x 1.00 = 10,000.

b. 10,000 x added to the original 10,000 is equal to 20,000.

If the question asked, what number is 200 percent of 10,000 the answer would also be 20,000:

10,000 x 2.00 = 20,000

6. 25% of 10,000 is 2,500.

10,000 x .25 = 2,500

7. The number that is 25% greater than 10,000 is 12,500.

a. 10,000 x .25 = 2,500

b. 2,500 + 10,000 = 12,500

or

c. 10,000 x 1.25 = 12,500

The latter method, (c), eliminates the addition required in the first computation. The figure that is 25% greater than itself is actually 100% of itself plus 25% of itself or 125%. Thus, method (c) allows us to find the answer to this problem in one step—by finding 125% of 10,000.

8. The number that is 125% of 10,000 is 12,500.

10,000 x 1.25 = 12,500

If the question were "what number is 100% of 10,000," the answer would be 10,000. In seeking the number that is 125% of 10,000, we are looking for the number that is 25% greater than 10,000. This is essentially the same question asked in Problem #7.

9. In 1996, the Chicago fire fighter was paid a salary that was 80.8% of the salary received by a New York City fire fighter:

a. Chicago fire fighter's 1996 salary (the part): $39,466

b. New York City fire fighter's 1996 salary (the whole): $48,873

c. Chicago fire fighter's salary as a percent of New York City fire fighter's salary: 80.8%

$39,466 ÷ $48,873 = .8075

.8075 x 100 = 80.75 or 80.8 %

Here the object is to determine the relationship of the Chicago fire fighters salary to the salary paid his counterpart in New York City. The New York City salary is essentially a benchmark, (or standard), against which the Chicago salary is being measured. Since it is the benchmark or standard for the measurement, it is assumed to be 100 percent. In other words, if the Chicago salary were $48,873 the fire fighter there would be receiving exactly the same salary as—or 100 percent of—the salary paid the New York City fire fighter.

10. True. The New York City fire fighter's salary is 123.8% of, (or 23.8 percent greater than), the salary of the Chicago fire fighter:.

a. New York City fire fighter's salary (the part): $48,873

b. Chicago fire fighter's salary (the whole): $39,466

c. New York City fire fighter's salary as a percent of Chicago fire fighter's salary: 123.8%

$48,873 ÷ $39,466 = 1.238

1.238 x 1.00 = 123.8%

The reason we received a different answer here, than the one we received in Problem #9, is that in this problem, Chicago and not New York is the benchmark or 100 percent in the comparison.

11. The calculations of the bus operator's salary as a percent of the fire fighter's salary are as follows:

Denver:

a. Bus operator's salary (the part): $34,563

b. Fire fighter's salary (the whole): $36,846

c. Bus operator's salary as a percent of fire fighter's salary: 93.8%

$34,563 ÷ 36,846 = .938

.938 x 100 = 93.8%

Houston:

a. Bus operator's salary (the part): $37,576

b. Fire fighter's salary (the whole): $35,783

c. Bus operator's salary as a percent of fire fighter's salary: 105.0%

$37,576 ÷ $35,783 = 1.050

1.050 x 100 = 105.0%

Atlanta:

a. Bus operator's salary (the part): $32,987

b. Fire fighter's salary (the whole): $34,365

c. Bus operator's salary as a percent of fire fighter's salary: 96.0%

$32,987 ÷ $34,365 = .959

.959 x 100 = 95.9 or 96.0%

As the above calculations indicate, the fire fighter's salary is the benchmark,(100 percent), against which the bus operator's salary is being measured. In Denver, the bus operator is paid a salary 6.2 percent below the fire fighter, (or 93.8% of the fire fighter's salary). It can thus be said that for every dollar of pay received by the fire fighter, the bus operator in Denver receives $.938. However, in Houston, the bus operator receives $1.05 in pay for every dollar received by the fire fighter.

Chapter II:
Percentage Change

Answers

1. The percentage increase in the number of public safety workers during the period was 400%.

a. Number of public safety workers in 1992: 50

b. Number of public safety workers in 1996: 250

c. Amount of change, 1992 to 1996: 250 - 50 = 200

d. Figure from which change occurred: 50

e. Amount of change divided by figure from which change occurred: 200 ÷ 50 = 4.00

f. Percent change 1992 to 1996: 4.00 x 100 = 400%

2. Between 1992 and 1996, the driver's hourly rate of pay increased 29.5%.

a. Driver's hourly rate in 1992: $10.50

b. Driver's hourly rate in 1996: $13.60

c. Amount of change, 1992–96: $13.60 - $10.50 = $3.10

d. Figure from which change occurred: $10.50

e. Amount of change divided by figure from which change occurred: $3.10 ÷ $10.50 = .295

f. Percent change 1992 to 1996:. 295 x 100 = 29.5%

3. The answer is true. The formula shown in Problem #3 for computing percentage increase is exactly the same formula that would be used to compute a percentage decrease. However, once the percentage decrease is found, you should indicate that it does represent a decline by placing a minus sign (-) in front of the number.

4. True. This is a short cut method for computing either a percent increase or decrease. In the case of Problem #2, the shortcut method for producing the percentage change in the driver's salary would have been:

$13.60 ÷ $10.50 = 1.295

1.295 - 1.00 = .295

.295 = 29.5%

Note: Either method of computing percent change is acceptable. However, from this point on, we will be computing all percentage changes by means of the above shortcut method.

5. Yes. The shortcut method can be used to compute both percent increases or percent decreases. In the case of the building inspectors their pay rate declined between 1993 and 1995 by 2.4%.

$10.00 ÷ $10.25 = .976

.976 - 1.000 = (-) .024

(-).024 = (-) 2.4%

6. During the period January through July 1995, the CPI increased 1.5%.

152.5 ÷ 150.3 = 1.015

1.015 -1.000 = .015

.015 = 1.5%

7. The percent increase for the period 1991–93 was 6.7% while the increase for the period 1993–96 was 4.7%.

Percent Increase: 1991–93

$32,000 ÷ $30,000=1.067

1.067 - 1.000=.067

.067=6.7%

Percent Increase: 1993–96

$33,500 ÷ $32,000=1.047

1.047 - 1.000=.047

.047=4.7%

8. The paramedics received a 5.3% increase.

The paramedics new hourly rate would be $11.00, ($10.45 + $ .55).

$11.00 ÷ $10.45 = 1.053

1.053 - 1.000 = .053

.053 = 5.3%

9. The answer is no. The percent increases, (or decreases), over two or more separate time periods cannot be added together in order to produce percent change over the entire time period. Thus, the 11.4% increase shown for the 1991–96 period—achieved by adding 6.7%, (1991–93) and 4.7%, (1993–96)—is wrong. The correct answer should be 11.7%.

$33,500 ÷ $30,000 = 1.117

1.117 - 1.000 = .117

.117 = 11.7%

10. The percentage change in the number of alarms per week for the periods (a) 1990–93, (b) 1993–96, and (c) 1990–96 are calculated as follows:

(a) 40 ÷ 30 = 1.333

1.333 - 1.000 = .333

.333 = 33.3%

(b) 35 ÷ 40 = .875

.875 - 1.000 = (-).125

(-).125 = (-) 12.5%

(c) 35 ÷ 30 = 1.167

1.167 - 1.000=.167

.167 = 16.7%

11. True. The minus sign (-) indicates that the figure represents a decline.

12. The unit's new hourly rate will be $10.07 per hour.

7.0% = .070

1.000 + .070 = 1.070

1.070 x $9.41 = $10.07

Chapter III:
The Mean and the Median

Answers

1. The average salary is $35,701 and is calculated as follows:

$38,393
37,123
34,881
34,574
+ 33,533
$178,504

$178,504 ÷ 5 = $35,701

2. The median salary is $34,881. The median is the midpoint of an array when the array is arranged from the highest value to the lowest value.

$33,533
34,574
34,881 **(midpoint)**
37,123
38,393

3. The average is $35,894.14.

$40,626
38,393
37,123
34,881
34,574
33,533
+ 32,129
$251,259

$251,259 ÷ 7 = $35,894.14

4. No, in both Problems, the median salary is $34,881

Problem #3		***Problem #1***
$40,626		
38,393		$38,393
37,123		37,123
34,881	**Median**	34,881
34,574		34,574
33,533		33,533
32,129		

Although two additional salaries were added to those presented in Problem #1, the median value did not change. The median value will never change when adding additional items to an array, as long as the same number of items are added both above and below the existing median. However, had the two additional figures added to the array for Problem #1 been values higher than $34,881, then the median would have shifted from $34,881 to $37,123. On the other hand, if they both had been values less than $34,881, the median would have shifted to $34,574.

5. The median percent increase is 7.2%. When a set of data contains an even number of items, the median is calculated by averaging the two middle items after the data have been arrayed from high to low:

9.0%
8.6%
8.0%
7.8%
Median
6.6%
6.0%
5.9%
5.5%

(7.8% + 6.6%) ÷ 2 = 7.2%

6. True. The major shortcoming of the average is that it can be affected by extreme values. On the other hand, extreme values exert no special influence on the median.

7. The average hourly rate of pay is $9.57, and the median hourly rate is $9.50:

The Average	***The Median***
$9.50	$11.00
10.25	10.76
9.01	10.50
8.75	10.25
9.15	10.00
11.00	9.50
10.76	9.50
9.50	9.50
8.50	9.30
9.30	9.15
9.50	9.01
8.26	8.75
10.00	8.50
+ 10.50	8.26
$133.98	

a. $133.98 ÷ 14 = 9.57

b. $9.50 + $9.50 = $19.00

$19.00 ÷ 2 = $9.50

8. True

9. The average fire fighter's salary for 1991 was $31,324.40 and the average salary for 1996 was $37,493.60:

Maximum Salary without Longevity

City	*1991*	*1996*
New York	$31,425	$38,458
Chicago	32,400	36,888
Los Angeles	31,668	38,808
Philadelphia	29,329	35,022
Detroit	31,800	38,292
Total:	**$156,622**	**$187,468**

1991 Average: $156,622 ÷ 5 = $31,324.40
1996 Average: $187,468 ÷ 5 = $37,493.60

10. The median salary for fire fighters in 1991 was $31,668, represented by Los Angeles. However, in 1996 the median salary was no longer represented by Los Angeles, but was Detroit's $38,292

City	***1991 Salary***	***City***	***1996 Salary***
Philadelphia	$29,329	Los Angeles	38,808
New York	31,425	New York	38,458
Los Angeles	31,668	Detroit	38,292
Detroit	31,800	Chicago	36,888
Chicago	32,400	Philadelphia	35,022

11. The missing number is 6, since there are six individual items being averaged.

20
15
45
30
16
+18
144

144 ÷ 6 = 24

12. The correct choice is: (a) average the values of the two middle items.

13. True.

14. True. For example, if asked to determine the average annual percent change for the period 1991 through 1996 the period would include six individual years—1991, 1992, 1993, 1994, 1995 and 1996. However, the number of annual changes would be five (1991–92, 1992–93, 1993–94, 1994–95, and 1995–96). Since there are five annual changes, the average annual change for the period 1991–96 would be determined by dividing the total percent change for 1991-96 by five—not six.

15. The average annual percent change for the period 1989-91 is 17.1% per year, (34.2% ÷ 2 years), while the average annual percent change for 1991-96 is 5.6% per year, (28.1% ÷ 5 years)

16. The average percent increase per month was 0.75%, (9.0% ÷ 12 months).

17. True

18. The unit's weighted average salary is $25,160.31 per year and is calculated as follows:

(1)	*(2)*	*(3)*	*(4)*
Classification	***Number of Employees***	***Annual Salary***	***Weighted Payroll (2) x (3)***
Private, Step 1	20	$23,530	$470,600
Private, Step 2	15	24,180	362,700
Private, Step 3	3	29,235	87,705
Driver	4	25,360	101,440
Lieutenant	2	28,910	57,820
Captain	5	30,518	152,590
Total:	**49**		**$1,232,855**

Weighted Average Salary: **$1,232,855 ÷ 49 = $25,160.31**

19. The unit's weighted average salary is $22,158.79 per year and is calculated as follows:

(1)	*(2)*	*(3)*	*(4)*
Classification	***Number of Employees***	***Annual Salary***	***Weighted Payroll (2) x (3)***
EMT 1			
1st Step	5	$27,130	$135,650
2nd Step	20	27,537	550,740
3rd Step	13	27,963	363,519
EMT 2			
1st Step	11	28,349	311,839
2nd Step	19	28,816	547,504
3rd Step	33	29,308	967,164
Paramedic			
1st Step	10	29,751	297,510
2nd Step	18	30,289	545,202
3rd Step	25	30,853	771,325
Total:	**154**		**$4,490,453**

Weighted Average Salary: **$4,490,453 ÷ 154 = $29,158.79**

20. By evaluating the two contracts in terms of the actual income that will be generated over their life, Unit B may feel it negotiated the better deal. The timing of wage increases will yield Unit B $ .313 per hour over its contract life, while Unit A's contract will generate only $.275 per hour over its life. To determine the relative impact or value of the two settlements in this way, we would use a statistical method known as time weighting. Time weighting is essentially nothing more than a weighted average. In the case of the weighted averages presented in Problems #18 and #19, the weights were the number of employees at each salary rate. However, in the case of the time weighting, the weights are the number of months each increase is in effect over the life of the contract. In this problem, it can be readily seen that $.10 of Unit A's total increase of $.50 will be effective for the contract's full 24 month term, another .30 will be effective for the last 12 months of the contract, and a final $.10 will be effective for the last 6 months of the contract. Weighting the individual increases by number of months they will be in effect yields their average value over the life of Unit A's agreement as follows:

a.	Initial increase weighted:	$.10 x 24 months =	$2.40
b.	Deferred increase weighted:	$.30 x 12 months =	$3.60
c.	Deferred increase weighted:	$.10 x 6 months =	$0.60
d.	Weighted total:	$2.40 + $3.60 + $.60 =	$6.60
e.	Weighted average increase over contract life:	$6.60 ÷ 24 months =	$0.275

When this process is applied to unit B, the calculation is as follows:

a.	Initial increase weighted:	$.25 x 24 months =	$6.00
b.	Deferred increase weighted:	$.05 x 12 months =	$0.60
c.	Deferred increase weighted:	$.15 x 6 months =	$0.90
d.	Weighted total:	$6.00 + $.60 + $.90 =	$7.50
e.	Weighted average increase over contract life:	$7.50 ÷ 24 months =	$0.313

Chapter IV

Average Percent Change vs. Growth Rates

Answers

1. The total percent increase would be 30.7% at the end of five years. This would be calculated as follows:

1st year	1.000 x .055 =.055
2nd year	1.055 x .055 =.058
3rd year	1.113 x .055 =.061
4th year	1.174 x .055 =.065
5th year	1.239 x .055 =.068
	Total .307

Percent Change: .307 x 100 = 30.7 or 30.7%

You can also find the answer by using the tables in Appendix A and tracing down to the fifth entry of 1.307 under the column labeled 5.5%.

2. The annual rate of increase in the fire inspectors' salary was 4.0% per year during the six-year period.

3. Your annual salary in the year 2011 would be $77,160. This figure was computed by multiplying 2.572, (the total growth at an annual rate of 6.5 percent per year), by the 1996 salary of $30,000.

4. The fire fighters would receive the larger total percent increase by the end of the contracts—25.3%, (7.8% compounded over 3 years), compared to the 24%, (8.0% x 3 years), for the teachers.

5. During the period 1989-96, the average increase per year in the Consumer Price Index was 4.3%, (30.1% ÷ 7), while the annual rate of increase was 3.8%.

6. (a) 3.3%

(b) 3.3%

(c) 2.8%

Chapter V:
Salary Comparisons

Answers

1. The average bus operator salary for the ten cities in 1990 is $26,380, while the median salary is $26,362.50. The arrangement of the data and the calculation of the average and the median are as follows:

Washington, D.C.	$28,130
Philadelphia	27,570
Milwaukee	27,235
New Orleans	26,920
St. Paul	26,425
Phoenix	26,300
Cleveland	26,100
Atlanta	25,830
Dallas	24,840
Miami	24,450
Total:	$263,800

a. The average: $263,800 ÷ 10 = $26,380

b. The median: Since there are ten items (an even number) in the array, the median is located midway between the fifth and sixth item. The fifth highest salary is St. Paul's, $26,425, while the sixth highest salary is Phoenix's $26,300. Thus, the median is calculated as:

$26,425 + $26,300 = $52,725

$52,725 ÷ 2 = $26,362.50

2. The average bus operator salary for the ten cities in 1996 is $30,380, while the median salary is $30,625.50. The arrangement of the data and the calculation of the average and the median are as follows:

Washington, D.C	$32,130
Philadelphia	31,570
Milwaukee	31,235
New Orleans	30,920
St. Paul	30,425
Phoenix	30,300
Cleveland	30,100
Atlanta	29,830
Miami	28,840
Dallas	28,450
Total:	$303,800

a. The average: $303,800 ÷ 10 = $30,380

b. The median: Since there are ten items (an even number) in the array, the median is located midway between the fifth and sixth item. The fifth highest salary is St. Paul's, $30,425, while the sixth highest salary is Phoenix's, $30,300. Thus, the median is calculated as:

$30,425 + $30,300 = $60,725

$60,725 ÷ 2 = $30,362.50

3. The percent increase from 1990 through 1996 in the average bus operator's salary in the ten cities is 15.2%.

$30,380 ÷ $26,380 = 1.152

1.152 - 1.000 = .152

.152 = 15.2%

4. The percent increase from 1990 through 1996 in the median bus operator's salary for the ten cities is 15.2%.

   $30,362.50 ÷ $26,362.50= 1.152

   1.152 - 1.000 = .152

   .152 = 15.2%

5. In 1982 the average and median bus operator-fire fighter salary relationship for the ten cities is 96.3%. The first step in solving the problem requires calculating for each city the bus operator's salary as a percent of the fire fighter's salary. (See: Workbook Chapter 1, Problems #9 through #11).

	(1) ***1990 Bus Operator Salaries***	***(2)*** ***1990 Fire Fighter Salaries***	***(3)*** ***(1) as % of (2)***
Washington, D.C.	$28,130	$28,650	98.2 %
Philadelphia	27,570	28,380	97.1 %
Milwaukee	27,235	28,150	96.7 %
New Orleans	26,920	27,250	98.8 %
St. Paul	26,425	26,425	100.0 %
Phoenix	26,300	27,000	97.4 %
Cleveland	26,100	27,535	94.8 %
Atlanta	25,830	26,780	96.5%
Dallas	24,840	26,240	94.7 %
Miami	24,450	25,560	95.7 %
Total:			**969.8 %**

   (a) *The average:* The figures in column (3) total 969.8%.

   969.8% ÷ 10 = 96.98% or 97.0%

   (b) *The median:* If the data in column (3) were arrayed from high to low, the mid-point would be located between Milwaukee's 96.7% and Philadelphia's 97.1%.

   96.7% + 97.1% = 193.8%

   193.8% ÷2 = 96.9% or 97.0%

6. In 1996 the average bus operator-fire fighter salary relationship for the ten cities was 97.4%, while the median relationship was 97.4%. The first step in solving the problem required calculating for each city the bus operator's salary as a percent of the patrolman's salary.

	(1) *1996 Bus Operator Salaries*	*(2)* *1996 Fire Fighter Salaries*	*(3)* *(1) as % of (2)*
Washington, D.C.	$32,130	$32,650	98.4 %
Philadelphia	31,570	32,380	97.5 %
Milwaukee	31,235	32,150	97.2 %
New Orleans	30,920	31,250	98.9 %
St. Paul	30,425	30,425	100.0 %
Phoenix	30,300	31,000	97.7 %
Cleveland	30,100	31,535	95.4 %
Atlanta	29,830	30,780	96.9 %
Dallas	28,840	30,240	95.4 %
Miami	28,450	29,560	96.2 %
Total:			**973.6 %**

(a) *The average:* The figures in column (3) total 973.6%.

973.6% ÷ 10 = 97.36% or 97.4%

(b) *The median:* If the data in column (3) were arrayed from high to low, the midpoint would be located between Philadelphia's 97.5% and Milwaukee's 97.2%.

97.5% + 97.2% =194.7%

194.7% ÷ 2 = 97.4%

7. The percent change in the ten city average from 1990 through 1996 was 0.4%.

(97.4% - 97.0%) ÷ 97.0% = 0.004123711 which is approximately 0.4%.

8. The percent change in the ten city median from 1990 through 1996 was 0.4%.

(97.4% - 97.0%) ÷ 97.0% = 0.004123711 which is approximately 0.4%.

9.

(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	Bus Operator Salary		*Total Percent Increase*	*Effective Dates**		*Number of*	*Avg. Monthly*
	1990	*1996*	*1990–96*	*1990*	*1996*	*Months*	*% Increase*
Washington, D.C.	$28,130	$32,130	14.2 %	Dec.	Jan.	61	0.23%
Philadelphia	27,570	31,570	14.5 %	Jul.	Jan.	66	0.22%
Milwaukee	27,235	31,235	14.7 %	Aug.	Dec.	64	0.23%
New Orleans	26,920	30,920	14.9 %	Dec.	Jan.	61	0.24%
St. Paul	26,425	30,425	15.1 %	Apr.	Aug.	64	0.24%
Phoenix	26,300	30,300	15.2 %	Dec.	Jan.	61	0.25%
Cleveland	26,100	30,100	15.3 %	Jan.	Dec.	83	0.18%
Atlanta	25,830	29,830	15.5 %	Jan.	Jul.	78	0.20%
Dallas	24,840	28,840	16.1 %	May	Nov.	76	0.21%
Miami	24,450	28,450	16.3 %	Jan.	Dec.	83	0.20%


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Chapter VI:
The Consumer Price Index (CPI)

Answers

1. The percent changes in the Consumer Price Index were: (a) 54.7%, (b) 18.8%, (c) 10.2%, and (d) 11.5%.

2. Using the 1995 and 1996 average annual CPI, we find that the percentage increase is 2.9%. Using the CPI's for December 1995 and December 1996 produces an increase of 3.3%. During periods of rapid inflation, using monthly data to calculate the percent change in the CPI will always produce higher increases than those derived by using average annual data. However, in periods when the rise in prices is slowing, the reverse will be true. In such instances, the percent changes produced by using the monthly CPI will be lower than those arrived at by using the annual averages of the Consumer Price Index.

When trying to decide whether to use monthly or annual average statistics for the CPI, it may be helpful to consider that since monthly data are more current, they may also be more relevant to your collective bargaining situation.

3. The answer is true. The selection of a base year for any index series is essentially an arbitrary decision. In the case of the Consumer Price Index, the average of the years 1982–84 are currently the base year, but in the past, other years served as base years.

4.

	1987–96	***1990–96***
U.S.	35.7%	19.5%
Baltimore	34.5%	17.7%
Boston	38.5%	16.9%

5. False. Each index point change in the CPI is not the equivalent of a one percentage point change. The only time each index point change is equal to one percentage point is when measuring the change in the index from the base period to some subsequent point in time.

6. No. The percentage changes exhibited by both indexes over similar periods of time would be the same.

7. The increase in the CPI measured from June through September 1996 is .65%.

Chapter VII:
Measuring "Real" Income

Answers

1. The constant dollar salary for 1989 is $22,023, (($27,000 ÷ 122.6) x 100), and the constant dollar salary for 1996 is $21,415, (($33,000 ÷ 154.1) x 100).

2. The real percentage change over the period was -2.8%.

3. No. In its present form the problem cannot be solved. The reason is that the CPI given for 1981 has as its base 1978, while the CPI given for 1988 has the average of the years 1982–84 as its base. Thus, if the hourly rates were converted into constant dollars, then the real hourly rate for 1981 would be in terms of 1978 dollars, (or purchasing power), while the 1988 real hourly rate would be in 1982–84 dollars. Always be sure that you are using CPI's which have the same base years.

4. False. The gain in real salaries cannot be found simply by subtracting the total increase in the CPI. The gain in real salaries can only be determined after the current dollar salaries have been converted into constant dollars.

5.

Year	*Annual Salaries*	*U.S. CPI 1982–84 as base year*	*Salary in 1982–84 Dollars*
1986	$27,000	108.6	$24,862
1987	28,000	112.5	$24,889
1988	29,000	117.0	$24,786
1989	30,000	122.6	$24,470
1990	31,000	129.0	$24,031
1991	32,000	134.3	$23,827
1992	33,000	138.2	$23,878
1993	34,000	142.1	$23,927
1994	35,000	145.6	$24,038
1995	36,000	149.8	$24,032
1996	37,000	154.1	$24,010

6. The correct answer is (c). When current dollar salaries are converted into constant dollars by using the CPI, they are being adjusted for inflation and are thus being converted into dollars that have the same value.

7. The percent change was a total of (-) .116%.

($24,010 - $24,038) ÷ $24,038 =
(-) 0.001164822 = (-) .116%

8. First convert salaries to constant dollars.
$35,150 ÷ 119.7 X 100 = $29,365 for both cities for 1988.

$45,000 ÷ 158.0 X 100 = $28,481 (New York, 1996)

$45,000 ÷ 156.8 X 100 = $28,699 (Chicago, 1996)

Next compute the percentage change for each city using constant dollar figures.

($28,481 - $29,365) ÷ $29,365 = (-) 0.0301 = (-) 3.0%

	New York City	Chicago
1988	$ 29,365	$29,365
1996	$28,481	$28,699
Percent Change:	(-)3.0 %	(-)2.3 %

Chapter VIII:
Urban Family Budgets

Answers

1. Your salary as a percentage of the budget in 1990 was 91.7%. This was calculated by dividing $30,000 by $32,719.

2. Your salary as a percentage of the budget in 1995 was 101.9%. This was calculated by dividing $38,915 by $38,192.

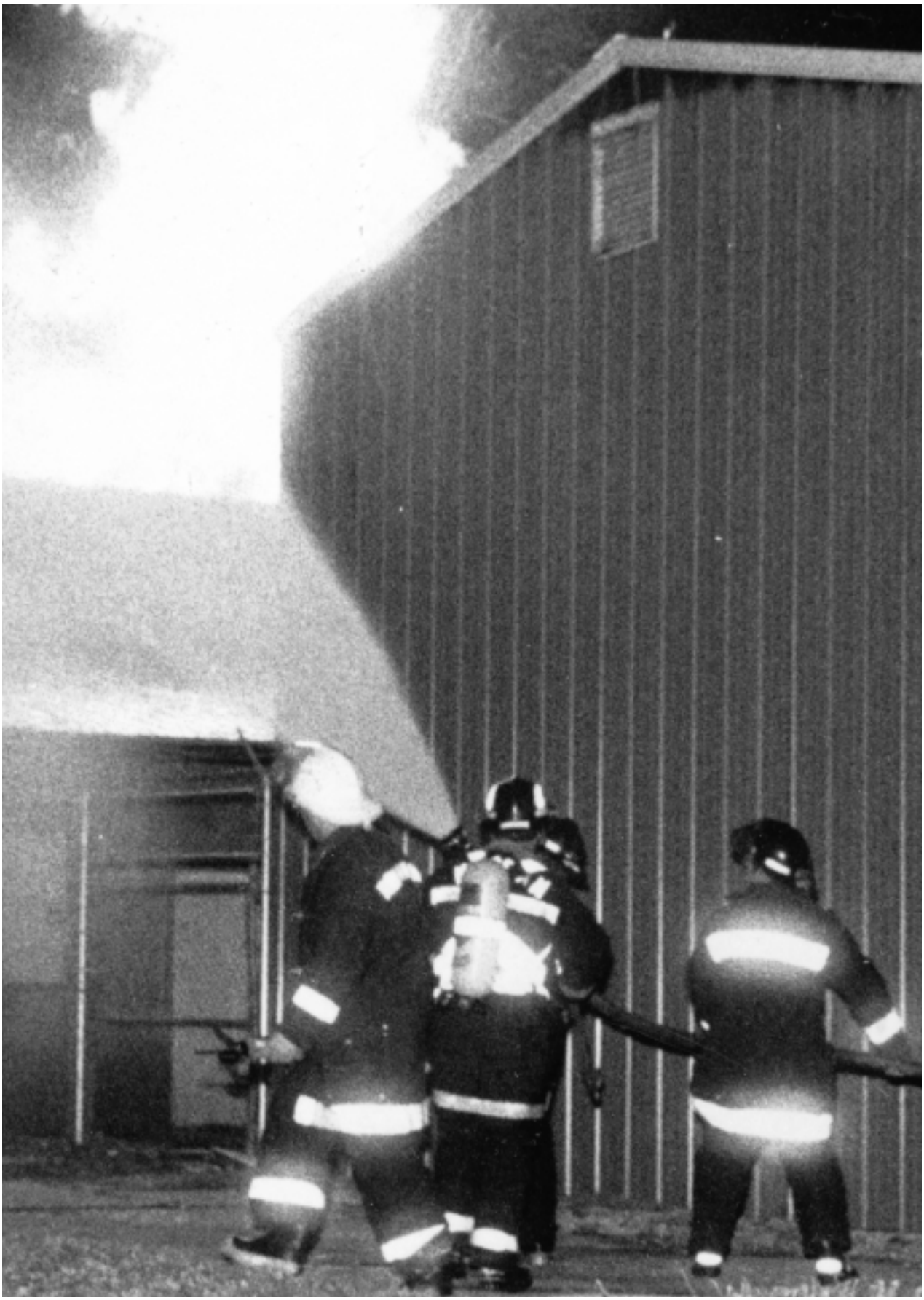
3. Your salary as a percentage of the budget increased from 1990 to 1995 by 11.1%, (101.9% ÷ 91.7% - 1 = 0.111 or 11.1%). Calculating the percent change over time for figures that are already percents is no different than calculating the percent change in index numbers such as the CPI.

4. True.

5.

Year	*Annual Salary*	*Intermediate Family Budget*	*Salary as a Percent of Budget*
1991	$33,000	$40,718	81.0%
1992	$33,500	$42,886	78.1%
1993	$34,000	$44,153	77.0%
1994	$35,000	$45,132	77.6%
1995	$36,000	$46,236	77.9%

6. The salary necessary to reestablish the 1991 relationship would be $37,451. This can be calculated by finding 81.0% of the budget for 1995, (0.810 x 46,236).



Chapter IX:
Cost of Living Escalator Clauses

Answers

1. The most appropriate cents-to-points formula for your bargaining unit is 1 cent per hour for every 0.2 point increase in the Consumer Price Index. This ratio was derived by dividing 153.1 index points by 750 cents.

2. The cumulative quarterly adjustments would be $.10 per hour for March 1996, $.16 per hour for June 1996, and $.21 per hour for September 1996. These figures were derived as follows:

March 1996: 152.9 -150.9 = 2.0

÷ 0.2 = 10 cents per hour

June 1996: 154.1 - 150.9 = 3.2

3.2 ÷ 0.2 = 16 cents per hour total since December 1995.

6 cent increase over March 1996.

September 1996: 155.1 - 150.9 = 4.2

4.2 ÷ 0.2 = 21 cents per hour total since December 1995.

5 cent increase over June 1996.

3. The March 1996 adjustment would be $.06 per hour, (152.9 -150.9 = 2, 2 ÷ .3 = 6.7 cents per hour). The June 1996 cumulative adjustment would calculate as $.10 per hour, (154.1 -150.9 = 3.2, 3.2 ÷ 0.3 = 10.7 or 10 cents per hour). However, the escalator provision states that the total cost-of-living adjustments may not exceed $.9 per hour in any one calendar year. Since the $.10 per hour due for June exceeds this $.9 maximum, the total June adjustment is $.9 per hour. The incremental adjustment over March 1996 would be 3 cents.

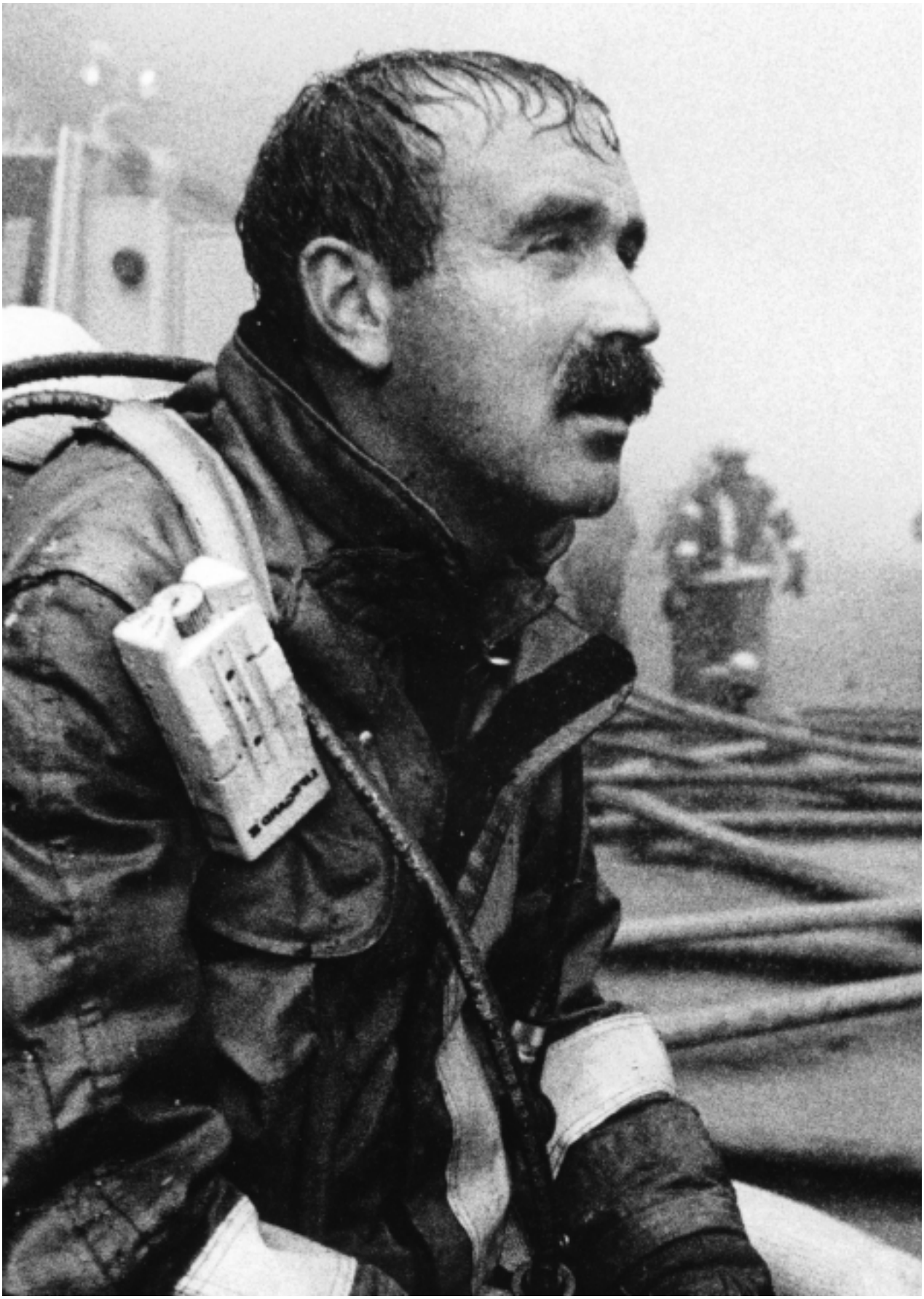
4. The loss in cost-of-living monies would be $.07 per hour with the remaining 0.5 of an index point left as an overhang.

5. Since the escalator in this case is not triggered until the CPI increases by at least 5%, your semi-annual adjustment would be 1%, (6% - 5%).

6. The figure the unit wants to protect is $7.50 per hour. Convert this to cents and divide it into 150.5 index points to get the correct formula. The appropriate cents-to-points formula for the bargaining unit escalator provision is 1 cent per hour for every 0.2 point increase in the Consumer Price Index. This ratio was derived by dividing 150.5 index points by 750 cents.

7. The unit's weekly salary is $300.00, ($7.50 per hour x 40 hours). The appropriate escalator formula, using the unit's weekly salary, is $1.00 for every 0.5 point increase in the Consumer Price Index. This ratio was derived by dividing 150.5 index points by $300.00.

8. No. Theoretically, it does not matter whether the formula is based on the hourly, weekly, bi-weekly, monthly, or even annual salary rates. The adjustment is the same.



Answers

1. The SBU's average straight-time hourly wage rate is $12.58 (weighted average).

2. The average annual dollar cost of the SBU's overtime is $68,894.37. This calculates to an average of $555.60 per fire fighter. According to the sample bargaining unit, all overtime hours are paid for at straight time rates and part is paid for at a premium payment. To simplify your calculations, you should break down the overtime payment into straight-time cost and half-time premium. This has been done for the SBU below.

	(1)	***(2)***	***(3)***
	Annual Cost	***Number of Fire Fighters***	***Average Annual Cost (1) ÷ (2)***
Straight-time Cost ($12.58 x 3651 overtime hours)	$45,929.58	124	$370.40
Half-time Premium Cost (1/2 x $45,929.58)	$22,964.79	124	$185.20
Total Overtime Cost	**$68,894.37**		**$555.60**

3. The total annual dollar cost of paid holidays is $168,471.36. In the SBU, each fire fighter receives 12 hours of pay for each of his 9 paid holidays. This means that each member of the unit receives a total of 108 hours of holiday pay per year. The calculation is total number of paid holiday hours is 13,392 hours, (108 hours x 124 employees). To find the total annual cost of paid holidays, multiply the unit's average straight-time hourly rate by the total number of paid holiday hours for the unit.

This calculation will give you a total of $168,471.36, ($12.58 x 13,392 hours). The average annual cost of paid holidays for each employee would be $1,358.64, ($168,471.36 ÷ 124 employees).

4. The total annual dollar cost of paid vacations for the SBU is $114,226.00. The cost of vacations is calculated by multiplying the total number of hours of vacation by the respective hourly rate derived from the salary scales shown below.

(1) ***Classification***	*(2)* ***Number of Fire Fighters***	*(3)* ***Hourly Rate***	*(4)* ***Hours of Vacation***	*(5)* ***Total Vacation Hours (2) X (4)***	*(6)* ***Total Vacation Costs (3) X (5)***
Private					
Step 1	15	11.10	40	600	$6,660.00
Step 2	23	11.65	40	920	10,718.00
Step 3	32	12.20	80	2560	31,232.00
Driver	24	12.80	80	1920	24,576.00
Lieutenant	18	13.75	96	1728	23,760.00
Captain	12	15.00	96	1152	17,280.00
Total	**124**				**$114,226.00**

The average annual vacation cost per employee would be $921.18, ($114,226 ÷ 124 employees).

5. The total annual dollar cost of the employers contribution for the SBU's hospitalization plan is $408,600.

(1) ***Type of Coverage***	*(2)* ***Number of Fire Fighters***	*(3)* ***Yearly Premium Cost to Employer***	*(4)* ***Total Cost to Employer (2) x (3)***
Single	13	$3,000	$39,000
Family	77	$4,800	$369,600
Total	**90**		**$408,600**

The average cost of of the employer's contribution to the SBU's hospitalization per fire fighter is $3,295.16, ($408,600 ÷ 124 employees).

6. The total annual dollar cost of the employer's contribution to the SBU's pension plan is $513,477.55. Pensions cost the employer 15.5% of the total payroll. The payroll can be calculated by totaling the annual salary cost and the annual overtime cost. This amounts to $3,312,758.37 ($3,243,864 + $68,894.37). 15.5% of this total is equal to $513,477.55. An average of $4,140.95 per fire fighter.

7. The total annual number of hours worked by the SBU is 257,920 hours.

8. The total average hourly base compensation would be $17.52. The calculation is shown below.

Straight–time Earnings	
Basic Salary	$3,243,864.00
Overtime	$45,929.58
	$3,289,793.58
Fringe Benefits	
Overtime Premium	$22,964.79
Paid Holidays	$168,471.36
Vacations	$114,226.00
Hospitalization	$408,600.00
Pension	$513,477.55
	$1,227,739.70
Total	**$4,517,533.28**

To find the average hourly base compensation of $17.52, you would divide the total annual base compensation by the total number of hours worked during the year, ($4,517,533.23 ÷ 257,920 hours).

9. The unit's straight-time hourly rate would be raised by $1.23, ($17.52 x 0.07).

10. True. When calculating increases in compensation costs, the cost, (i.e., the base costs, as well as the cost of any new improvements), of salary related fringe benefits must be increased, (or rolled-up), by the same percentage amount as the wage increase.

11. The increase in the unit's average hourly over-time premium costs is $0.019. The average hourly cost of over-time before the cost impact of the roll-up is $0.26, ($68,894.37 ÷ 257,920 hours). 7.0% of this total is $0.019, or 1.9 cents.

12. The average hourly cost of hospitalization for the unit will increase by $.036 per hour. Since the employer's contribution to the unit's hospitalization plan is a fixed a monthly premium and not salary related, the roll-up factor is not applied to the hourly cost of hospitalization. Although the improvement in the family coverage of $10 per month will only benefit 77 of the 90 employees, its cost must be averaged over the entire unit as shown below.

a. Increased Annual Cost of Hospitalization $10 per month x 12 months x 77 employees = $9,240

b. Increased Hourly Cost of Hospitalization $9,240 ÷ 257,920 hours = 3.6 cents per hour.

NOTES

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International Association of Fire Fighters®
1750 New York Avenue, NW
Washington, DC 20006
202.737.8484
Fax 202.737.8418

International Association of Fire Fighters, Canada
Association International Des Pompiers
350 Sparks Street, Suite 403
Ottowa, Ontario
Canada K12 7S8
613.567.8988
Fax 613.567.8986