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STATISTICS

**in a World of
Applications**

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Fourth Edition

Ramakant Khazanie

STATISTICS

**in a World
of Applications**

.....

Fourth Edition

Ramakant Khazanie
Humboldt State University

 HarperCollinsCollegePublishers

To the memory of my grandparents, my father, and my brother, Suresh

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fewer assets than older, more established ones, there's cold comfort in those figures, too: The 1993 median for families headed by someone 45 to 54, for example, was a mere \$2,600.

Not only do those figures represent a "woeful low," as characterized by John L. Steffens of Merrill Lynch, which commissioned the analysis, but the low has been getting lower just as the nation's economic pilots have been fretting that their beast is soaring too high. What's going on? Apparently just more of that familiar refrain

about the rich getting richer. As the Capital Research Associates study also makes clear, if with some qualifiers, *mean* family wealth jumped smartly during the same two-year span that *median* wealth swooned. In other words, while at least half of all Americans were watching their already shriveled nest eggs diminish even more, there is at least some statistical suggestion that a small minority was growing very much better off.

In this recovery, many more boats seem to have been swamped than lifted.

2-3 MEASURES OF DISPERSION

As useful as the measures of central location are in providing some understanding about the data in a distribution, total reliance on the information conveyed by the mean, the median, and the mode can be misleading, as we now illustrate.

Suppose a test is given to two sections of a class, Section A and Section B. Table 2-2 gives the scores (in points) recorded in the two sections.

We can verify that both sections have the same mean score (60), the same median score (60), and the same mode (60). Solely on the basis of this information, however, it would be wrong to infer that the two sets of data are similar. In Section A, the group of students is homogeneous, all of them scoring in the vicinity of 60 points. In Section B, on the other hand, the performance is very erratic, from a low of 30 points to a high of 90 points. If we choose a student from Section A, we can assume that the student's score will be close to 60 points. We cannot say the same about a student chosen from Section B.

Often, a revealing picture emerges by considering histograms of the distributions, as in Figure 2-6. The two distributions give the tensile strength of cables manufactured by two processes. In both cases, we have the same mean, median, and mode. However, there is smaller variability in the data for the histogram in Figure 2-6(a) than for the histogram in Figure 2-6(b).

Variability of values in data collected is a very common phenomenon, and its importance should be acknowledged. For instance, a company manufacturing electric bulbs will be interested not only in the average life of the bulbs, but also in how consistent the performance of the bulbs is. The manufacturer interested in marketing bulbs with a mean life of 1000 hours will not

TABLE 2-2 Test Scores in Sections A and B

Section A Scores	Section B Scores
56	30
58	35
60	60
60	60
60	60
62	85
64	90

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