

## Correction of an Error in "The Variation of Certain Speculative Prices" (1963)

I have found an error in my paper, "The Variation of Certain Speculation Prices," which first appeared in this *Journal* in October 1963 (vol. 36, pp. 394-419) and was later reprinted in *The Random Character of Stock Market Prices*, edited by P. H. Cootner (M.I.T. Press, 1964). In this paper the hypotheses of infinite variance and of non-Gaussian stable distribution of price differentials were introduced for the first time. The prime material on which both hypotheses were based had been obtained, in part from H. S. Houthakker and in part from the U.S. Department of Agriculture, and concerned daily spot prices of cotton.

Since then, the usefulness of the hypotheses in question has been confirmed by the study of many other records, both in my work and in that of others. On the other hand, it has now come to my attention that part of my early evidence involved a serious error. In the USDA data sheets an important footnote had been trimmed off, and as a result they were misread. Numbers which I had interpreted as Sunday closing prices were actually weekly price averages that had been—for the sake of convenience—inserted in blanks otherwise present in the data sheets. My repeated admiring joke about the hard-working American cotton dealers of 1900-1905 was on me, and I shudder at some comments that must have been made about my credibility. As a result, part of the main exhibit (fig. 5) of my paper, namely, curves *1a* and *2a* relative to that period, were incorrect.

After several sleepless nights, I have been able to examine a revised analysis of the data, in which this error has been corrected. I am happy to report that no harm had been done, in fact that everything has been much simplified and that the fit between the theory and data has considerably improved. Originally, I had noted numerous peculiarities that had led me to consider the hypotheses as no more than rough first approximations. I had noted, for example, that the theory in its simplest random-walk form implied that a monthly price change is the sum of independent daily price changes. In fact, such was the case only if one assumed that a month included an "apparent number of trading days . . . smaller than the actual number." Also the theory implied that whenever a monthly price change is large, it is usually about equal to the largest contributing daily price change. In fact, instances when large monthly changes resulted from, say, three large daily changes (one up and two down, or conversely) were too numerous. Both findings suggested that a strong negative dependence exists between successive price changes. Also, prices seemed to have varied more around 1900 than around 1950. Now these peculiarities have entirely disappeared. In particular, the corrected curves *1a* and *2a* are nearly indistinguishable from the corresponding curves *1b* and *2b* relative to the Houthakker data concerning the period 1950-58.

As to interdependence between price changes, I have reported at the 1970 Second World Congress of Econometrics that the use of the new technique of R/S analysis has shown it is indeed present—contradicting the "random-walk" model of an efficient market. But it is slight, which means it may well be compatible with a random walk corrected for market inefficiency. Also, it is positive, which means that the direction of price change has a tendency to "persist on the long run," and it suffices to account for the irregular nonperiodic cycles that have always been observed in such price records.