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Using the Price-to-Earnings Harmonic Mean to Improve Firm Valuation Estimates

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This paper reviews some well-known options to estimate the portfolio average of the price-earnings (P/E) multiple, emphasizing the logic and calculation of the harmonic mean. The harmonic mean is a useful but oftentimes unfamiliar calculation to many students and professionals. The simple arithmetic mean when applied to non-price normalized ratios such as the P/E is biased upwards and cannot be numerically justified, since it is based on equalized earnings. The paper advocates the use of the classic harmonic mean when the need is for an equal-dollar-weighted average and the weighted-average harmonic mean when the need is for an index style market-weighted average.

INTRODUCTION

A frequently used method by financial analysts to value a firm is the comparables approach, a technique resting on the logic of the law of one price—substitutes should sell at a similar relative price. In this approach, market multiples such as market-to-book, value to EBITDA, price to cash flow, price to sales and, most commonly, price-earnings (P/E) are often used. Subsequently, these individual multiples are aggregated at the portfolio level to provide a unified number. Herein lies the problem—is there a best way or even an accepted way to average these individual multiples?

When asked to compute an average, many students as well as practitioners assume the arithmetic mean is what is called for; often they are not aware that there are better alternative approaches to capture the central tendency of a sample. In the case of relative valuation (i.e., the comparables approach) the choice of averaging method does matter. As we will show later, using the arithmetic mean creates a consistent upward bias in valuations. On the other hand, the much less familiar harmonic mean provides a more logical approach to averaging valuation multiples such as P/E. Students, instructors, and practitioners interested in valuation need to be familiar with this important tool. The harmonic mean is not a new calculation by any means and it is used by some

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Abstract

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