

7-1939

Mathematical Proof of a Proposition in Partnership Accounting

Maurice Moonitz

Follow this and additional works at: <https://egrove.olemiss.edu/jofa>



Part of the [Accounting Commons](#)

Recommended Citation

Moonitz, Maurice (1939) "Mathematical Proof of a Proposition in Partnership Accounting," *Journal of Accountancy*. Vol. 68: Iss. 1, Article 5.

Available at: <https://egrove.olemiss.edu/jofa/vol68/iss1/5>

This Article is brought to you for free and open access by the Archival Digital Accounting Collection at eGrove. It has been accepted for inclusion in Journal of Accountancy by an authorized editor of eGrove. For more information, please contact egrove@olemiss.edu.

A Mathematical Proof of a Proposition in Partnership Accounting

BY MAURICE MOONITZ

SOME interesting problems are encountered in connection with the distribution of assets during the liquidation of a partnership. Not the least interesting is the one requiring instalment distributions to the partners before it is definitely known whether or not all assets will be realized upon at or near their book value. In such problems, the danger point is past if the partners' capital accounts can be brought into the profit-and-loss sharing ratio (assuming that any loans due partners have either been paid, or merged into the capital accounts), because then, even if all remaining value is lost, the partners have just enough in their capital accounts to absorb the charge to capital for the loss. This has been recognized for many years, and all the standard texts carry solutions which fit into this principle.¹

In any given situation, with respect to capital accounts of partners, the amounts which should be paid to part-

ners and the order of participation for them can be determined. However, no situation ever remains "given," in such problems, and a seeming complication is introduced by the fact that, in addition to the uncertainty surrounding the realizable value of assets to be liquidated, certain unknown expenses will undoubtedly emerge. Hence, most solutions treat such problems as a series of unique situations, that is, the amount available for distribution is determined, then the distribution is made; additional liquidation takes place and a new solution is worked out for the next distribution, and so on, until the assets are completely liquidated. Such calculations may prove to be quite tedious, and any means of lightening such a task is always welcome as a practical matter, in addition to the value any short cut might have from a theoretical point of view.

With such an end in view, the following is presented:

To Prove

If various partners have capital accounts which are not in the profit-and-loss sharing ratio, an increase or decrease in those accounts, on the profit-and-loss ratio, will not change the absolute amounts necessary to be paid to one or more partners in order to bring those capital accounts into the profit-and-loss ratio.

Proof

Let m_a equal the present size of A's capital account;
 m_b " " " " " B's " "
 m_c " " " " " C's " "

And, let f_a equal the amount to be paid to A in order to bring his capital account into the proper ratio;

f_b ditto for B;
 f_c ditto for C.

(These amounts may all be zero, which is the special case in which the capital accounts are already in the profit-and-loss ratio.)

$p : q : r$ is the profit-and-loss ratio; m_a, m_b, m_c , are not in the profit-and-loss ratio.

¹E.g., Hatfield, H. R., *Accounting* (New York, 1927), pp. 420-24, "Instalment Distribution in Liquidation."

Then,

(1) $(m_a - f_a) : (m_b - f_b) : (m_c - f_c) :: p : q : r$.

(2) Expenses emerge: s_a equals A's share;
 s_b " B's " ;
 s_c " C's " .

$(s_a : s_b : s_c :: p : q : r)$

The theorem stated above requires then, that

(3) $(m_a - f_a - s_a) : (m_b - f_b - s_b) : (m_c - f_c - s_c) :: p : q : r$

If this is true, then:

(4) $(m_a - f_a - s_a) : (m_b - f_b - s_b) : (m_c - f_c - s_c) :: (m_a - f_a) : (m_b - f_b) : (m_c - f_c)$

Restated:

(5) $\frac{m_a - f_a - s_a}{m_a - f_a} = \frac{m_b - f_b - s_b}{m_b - f_b} = \frac{m_c - f_c - s_c}{m_c - f_c}$

Using the first two fractions, and cross-multiplying:

(6) $m_a m_b - m_a f_b - f_a m_b + f_a f_b - s_a m_b + s_a f_b = m_a m_b - m_a f_b - m_a s_b - f_a m_b + f_a f_b + f_a s_b;$
 $-s_a m_b + s_a f_b = -m_a s_b + f_a s_b;$
 $s_a(m_b - f_b) = s_b(m_a - f_a);$
 $\frac{s_a}{s_b} = \frac{m_a - f_a}{m_b - f_b}$

(7) From (2) above: $\frac{s_a}{s_b} = \frac{p}{q}$. From (1) above: $\frac{m_a - f_a}{m_b - f_b} = \frac{p}{q}$

Therefore, (7) above is a valid equation, and if (7) is valid, all preceding it is valid, and (3), the algebraic representation of the proposition, is valid. *Q.E.D.*

Comments on the demonstration: There are two points in particular to be noted. First, the proposition refers to adjustments to the capital accounts which are to be made on the profit-and-loss ratio. This would include losses and gains in liquidation, no matter from what source, or losses and gains sustained before liquidation but not discovered until liquidation had started. The only requirement is that whatever adjustments are made must be on the profit-and-loss ratio, else the proposition is inapplicable. This would exclude, for example, adjustments which affected one partner only.

The second point to be noted is that the proposition refers to the *absolute* amounts to be paid. If it has been determined that Partner A is entitled to \$3,000 before B and C can participate, this amount is not affected by the emergence of expenses or gains during liquidation. If A has already received

\$2,000, and expenses emerge, the proper adjustments should be made to the capital accounts; but, after all adjustments, no matter what their magnitude, A is still entitled to \$1,000 before B and C can participate. It is here that the proposition is of use. Once it has been determined how much need be paid, and in what sequence, no new calculations need be made in order to determine any new order of participation, *provided* no adjustments are made except on the profit-and-loss ratio.

It is perhaps obvious, but it will be stated, that all of this has reference to the situation in which the profit-and-loss ratio has not yet obtained among the capital accounts, so that there is still danger of overpaying someone with the consequent risk of inability to collect back, if need for this should arise. Once the capital accounts have reached the profit-and-loss ratio, there is no longer any problem.