A Study on the Activity-Based Profitability Analysis (2)

Review of the Alternative Profitability Analysis Method with Focus on its Logic

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1. Intro

This is the second paper of three-part series, which reviews the Palepu & Healy method and the Penman method as two examples of the alternative profitability analysis method. After reviewing them, problems of the Palepu and Healy method will be pointed out.

The first paper discussed that ROE has a problem of mixing up the operating factor and the financing factor (the first level contamination). The traditional profitability analysis method, which distinguishes between the operating factor and the financing factor by breaking ROE down into three value drivers (ROA, financial leverage and SPREAD), and expressing it with them, resolves the first level contamination.

The traditional profitability analysis method, however, still has contamination. Its value drivers do not distinguish between the operating factor and the financing factor (the second level contamination). The alternative profitability analysis method has been developed to resolve this problem.

This paper first explains the above mentioned problem of the traditional profitability analysis method more in detail. Recognizing the problem will be helpful to understand how and why the alternative profitability analysis method has been developed from the traditional profitability analysis method. Then, as two examples of the alternative profitability analysis method, the Palepu and Healy method and the Penman method, will be introduced.

2. Problem of the Traditional Profitability Analysis Method

(1) Second Level Contamination

As pointed out in the first paper, ROE has the problem of not distinguishing between the operating factor and the financing factor, which means it incorporates different types of factors relating to the operating activities and

the financing activities. In other word, ROE is "contaminated". This contamination is called the "first level contamination" in the first paper.

The traditional profitability analysis method resolves the first level contamination by decomposing ROE into three value divers, ROA, financial leverage and SPREAD. ROE is expressed by both the operating factor (ROA) and the financing factor (financial leverage × SPREAD). This method attempts to show the pure profitability without the effect of the financing factor.

Since the pure profitability means the veritable profitability gained from the main business activities, it can be called core profitability. It is important and essential in making a sound decision to know the core profitability that is not affected by the financing factor.

As stated in the first paper, the traditional profitability analysis method has a problem of the second level contamination. The value drivers of ROE do not distinguish between the operating factor and the financing factor and are contaminated, which is the second level contamination. The traditional profitability analysis method cannot resolve all of the contamination. Explanation of how each value driver is contaminated is as follows.

As explained in the first paper, one way of expressing ROE is:

$$ROE = ROA + financial\ leverage \times SPREAD \qquad \text{(Formula 1)}$$

First, ROA (EBIT/total assets) is contaminated. ROA is a value driver of the operating factor that focuses on the operating activities. The denominator of ROA is total asset. Total asset contains different types of assets. Firms engage in two different types of activities that are the operating activities and the financing activities. Since total asset that incorporates both operating assets relating the operating activities and financing assets relating the financing activities [1)], ROA is contaminated (the second level contamination).

Next, financial leverage ($\frac{total\ liabilities}{equity\ capital}$) is also contaminated. The numerator of it is total liabilities that consist of two kinds of liabilities which are operating liabilities and financing liabilities [2)]. The financial leverage in the traditional profitability analysis method does not distinguish between the operating factor and the financing factor in its calculation (the second level contamination).

Lastly, SPREAD, which is obtained by subtracting r from ROA, is also contaminated because, as mentioned above, ROA is contaminated. Furthermore, r is obtained by dividing interest expenses by total liabilities, meaning that r is calculated based on total liabilities that incorporate both operating liabilities and financing liabilities.

Therefore, r is also contaminated. As a result, SPREAD is contaminated like the other value drivers (the second level contamination).

(2) Problem Resulting from the Second Level Contamination

The second level contamination may mislead financial statement users' decision-making like the first level contamination. The value drivers of ROE are affected by both the operating factor and the financing factor. Unlike the operating factor, the financing factor related to the financing activities (for example, the way of fund raising) does not contribute to the profitability directly. Therefore, if financial statement users do not recognize that the value drivers in the traditional profitability analysis method incorporate the effect of the financing activities, they may not be able to make a right decision in the profitability analysis.

3. Review of the Alternative Profitability Analysis Method

The alternative profitability analysis method has been developed to resolve the problem in the traditional profitability analysis method by introducing the distinction between the operating factor and the financing factor in calculations of ROE 's value drivers. In the following paragraphs, two examples of the alternative profitability analysis method will be reviewed. One was developed by Palepu and Healy (2007) and the other by Penman (2007).

(1) Palepu and Healy Method

In the Palepu and Healy method (2007), ROE is defined as $\frac{net\ income}{equity\ capital}$. The decomposition of ROE according to this method is as follows:

$$ROE = operating\ ROA + net\ financial\ leverage \times SPREAD$$

(Formula 2)

Both Formula 1 in the traditional method and Formula 2 in the Palepu and Healy method are based on the same logic. And the factors are constructed by essentially the same three value drivers. Both the methods express ROE with two factors, the operating factor (ROA) and the financing factor (the financial leverage effect: last two terms of the formula).

However, there is a difference between the two methods. The Palepu and Healy method distinguishes between the operating factor and the financing factor in calculating the value drivers of ROE. ROE is decomposed into operating ROA, the net financial leverage, and SPREAD. Each value driver focuses on either the operating factor or the financing factor.

First, operating ROA focuses on the operating factor. Operating ROA is defined as $\frac{NOPAT}{Net\ Assets}$ Net assets equals

"total assets minus financing assets [3]." This means that net assets focus on the operating factor. The numerator is Net Operating Profit After Tax (NOPAT) which is obtained by adding net income and net interest expense after tax [4] NOPAT defined by Palepu and Healy is based on net income that is the bottom line of an income statement. The author of this paper does not concur with this calculation of NOPAT. This will be discussed later as the problem of the Palepu and Healy method.

Operating ROA is a ratio corresponding to ROA in the traditional profitability analysis method, which assesses the profitability of the main operating activities of the business entity. ROA in the traditional profitability analysis method is contaminated because the denominator is total asset that incorporates operating assets and financing assets. On the other hand, net asset that is the denominator of operating ROA distinguishes between the operating factor and the financing factor, and focuses on the operating factor.

Second, net financial leverage focuses on the financing factor. Net financial leverage corresponds to financial leverage in the traditional method, which explains the percentage of the borrowing capital against the equity capital.

Since net financial leverage is a ratio relating to how a firm raises funds, it should focus on the financing activities. Net financial leverage is defined as

$$\frac{net\ debt}{equity\ capital}$$

. The numerator is net debt that is obtained by subtracting financing assets from financing debt [5]. This means net financial leverage distinguishes between the operating factor and the financing factor, and focuses on the financing factor.

The third value driver, SPREAD, is defined as "operating ROA minus effective interest rate after tax". As mentioned previously, operating ROA which is one component of SPREAD is pure. Another calculation component of SPREAD is effective interest expense after tax.

This is defined as

$$\frac{net\ interest\ expense\ after\ tax}{net\ debt}$$

The denominator is net debt that is obtained by subtracting financing assets from financing debt. This means that net debt focuses on the financing factor. Therefore, effective interest expense after tax also distinguishes between the operating factor and the financing factor same as operating ROA. Hence, SPREAD attempts to resolve the second level contamination.

The Palepu and Healy method attempts to resolve both the first level and second level contaminations. The first level contamination is resolved by decomposing ROE into two factors, the operating factor (operating ROA) and the financing factor (net financial leverage effect × SPREAD). The second level contamination is resolved by distinguishing between the

operating factor and the financing factor in calculating the three value drivers.

However, the Palepu and Healy method has a limitation as discussed later on.

(2) Penman Method

The Penman method is based on the same logic as that of the Palepu and Healy method. The logic is that the profitability should be analyzed using the operating factor and the financing factor separately. The Penman method is expressed with:

$$ROCE = RNOA + FLEV \times SPREAD$$

(Formula 3)

Profitability ratio from the shareholders' perspective in the Penman method is "Return On Common Shareholders' Equity" (ROCE). ROCE corresponds to ROE in the traditional method and ROE in the Palepu and Healy method. ROCE is defined as follows [6].

$$ROCE = \frac{CNI}{CSE}$$

The numerator is comprehensive Net Income (CNI). Use of CNI is one of the features of the Penman method. The denominator is Common Shareholders' Equity (CSE) that is equal to the equity capital. ROCE is a ratio that assesses how efficiently a firm earns profits with the equity capital.

ROCE can be expressed with three value drivers, RNOA, FLEV, and SPREAD. RNOA is a profitability ratio that focuses on the operating factor. FLEV is a ratio that shows the ratio of Net Financial Obligations (NFO) to the equity capital. SPREAD is the difference between RNOA and Net Borrowing Cost (NBC) and obtained by dividing Net Financial Expense (NFE) by NFO. These three value drivers affect ROCE. The detailed explanations of the value drivers will be discussed in the following paragraphs.

First, RNOA that is defined as $\frac{OI}{NOA}$ is a profitability ratio that attempts to assess the pure profitability focusing on the operating activities, excluding the effect of the financing factor.

Operating Income (OI), the numerator of RNOA, is not a concept reported in an income statement. Operating income reported in an income statement is obtained by subtracting operating expenses from gross margin. On the other hand, OI [7] in RNOA is obtained by subtracting Operating Expenses (OE) from Operating Revenues (OR) [8]. Thus, OI in RNOA focuses on the operating activities defined in the Penman method.

The denominator of RNOA is Net Operating Assets (NOA). It is obtained by subtracting Operating Liabilities (OL) from Operating Assets (OA). NOA focuses on the operating factor. RNOA distinguishes between the operating factor and financing factor in its calculation to resolve the second level contamination.

Second, FLEV that is defined as $\frac{NFO}{CSE}$ expresses the ratio of Net Financial Obligation (NFO) to Common Shareholders Equity (CSE). It reports the ratio of borrowing capital to the equity capital.

The numerator is NFO that is obtained by subtracting Financing Assets (FA) from Financing Obligation (FO) [9]. NFO distinguishes between the operating factor and the financing factor, and focuses on the financing factor.

Lastly, SPREAD that is defined as (RNOA – NBC) is discussed. NBC corresponds to r in the traditional method. It is defined as $\frac{NFE}{NFO}$ NFE is obtained by subtracting Financing Revenues (FR) from Financing Expenses (FE), which relates to the financing activities. NFO is discussed already. Both the numerator and the denominator of NBC focus on the financing factor.

Same as the Palepu and Healy method, the Penman method attempts to resolve both the first level and second level contaminations. The first level contamination is resolved by decomposing ROCE into two factors, the operating factor (RNOA) and the financing factor (FLEV × SPREAD). And the second level contamination is resolved by distinguishing between the operating factor and the financing factor in calculating the three value drivers.

(3) Comparison between the Palepu and Healy Method and the Penman Method

As discussed already, both the methods are based on the similar logic in breaking down ROE or ROCE to resolve the first level contamination. In addition, both the methods distinguish between the operating factor and the financial factor in calculations of value drivers to resolve the second level contamination. However, they are different in one respect.

It is the classification of operating assets and liabilities, and financing assets and liabilities. In the Palepu and Healy method, assets and liabilities are classified as operating assets or financial assets from two dimensions. Two dimensions are ① current-noncurrent dimension and ② activity-type dimension. Primarily, current-noncurrent dimension does not relate directly to the activity-based profitability analysis because the dimension is generally used for the liquidity analysis. For this reason, the classification of the operating factor and the financing factor in the Palepu and Healy method is not proper. The author of this paper regards that this is a limitation of this method.

On the other hand, in the Penman method, assets and liabilities are classified as operating assets or financial assets from one dimension. It is activity-type dimension. In the Penman method, financial statement items are reformulated for the profitability analysis.

For example, current assets and liabilities and noncurrent assets and liabilities are reclassified into operating assets and liabilities and financial assets and liabilities in "reformulated balance sheet". Same as this, income statement items are reclassified as operating revenues and expenses and financial revenues and expenses, which is called “reformulated income statement”. That the profitability is analyzed based on these reformulated financial statements is a feature of the Penman method. This resolves the problem of the theory in the Palepu and Healy method.

In sum, as discussed above, the Palepu and Healy method has a limitation. Although the method attempts to resolve the second level contamination by distinguishing between the operating factor and the financing factor in calculating value drivers, the logical consistency of each driver, which is the most important essence in the ratio analysis, is not adequate. In other words, the contents of each driver’s computational elements are not always clear. As one example of such unclarity, the relationship between the numerator and the denominator of operating ROA is not consistent.

4. Conclusion

The alternative profitability analysis methods have merits that result from the following two characteristics: ① clear distinction between the operating factor and the financing factor in calculating value drivers and ② adoption of net base concept.

First, it is essential to understand the core profitability that focuses on the main operating activity for judging the profitability of the entity adequately. Furthermore, as the finding obtained from the reviews of the Palepu and Healy method and the Penman method, it was found that strict distinction between the operating factor and the financing factor is important. The clear distinction leads the financial statements users to make a sound decision.

Secondly, there is a merit due to the adoption of net base concept. It was found that both the Palepu and Healy method and the Penman method adopted net base concept in elements of value drivers’ calculation. For example, there are the concept of net operating asset as the balance amount between operating asset and operating liability, and one of net financing liability as the balance amount between financing asset and financing liability. In the traditional method, financial leverage is a ratio that focuses only on the aspect of fund-raise. On the other hand, FLEV in the Penman method is a ratio that covers not only the

aspect of fund-raise but also that of fund-operation. In that sense, the Penman method has a wider vision in the profitability analysis.

In this paper, the alternative profitability analysis methods, the Palepu and Healy method and the Penman method, were reviewed focusing the logics of them. In addition, the features in the two methods were discussed briefly. In Paper 3, how the operating activities and the financing activities are defined by the two methods will be reviewed. Then, the comparison between the two methods will be discussed. Moreover, explanation of which method is more suitable for the analysis of companies in Japanese business environment will be considered.

(Note)

1) The explanations and definitions of them will be discussed in Paper 3.
2) Operating liabilities are liabilities used in the operating activities. Financing liabilities are liabilities used in the financing activities. The explanations and definitions of them will be discussed in Paper 3.
3) Financing assets are assets used in the financing activities. The explanations and definitions of it will be discussed in Paper 3.
4) This definition is by Palepu and Healy method, but NOPAT is sometimes defined as operating profit × (1－tax rate)
5) The detail definition about net debt will be discussed in Paper 3.
6) In the description about the Penman method, acronyms that are used in Penman (2007) are also used in this paper. The counterparts to them in the traditional method and the Palepu and Healy method are specified on a case-by-case basis.
7) It is an income concept that is obtained by reclassifying and reformulating an income statement. In detail, it will be discussed in Paper 3.
8) The definitions of operating expenses and operating revenues will be discussed in Paper 3.
9) Since FA and FO are obtained through the reclassification and the reformulation of a balance sheet, they are based on the definitions of the financing activities defined by the Penman method.

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