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Ara G. Volkan

Joseph C. Rue

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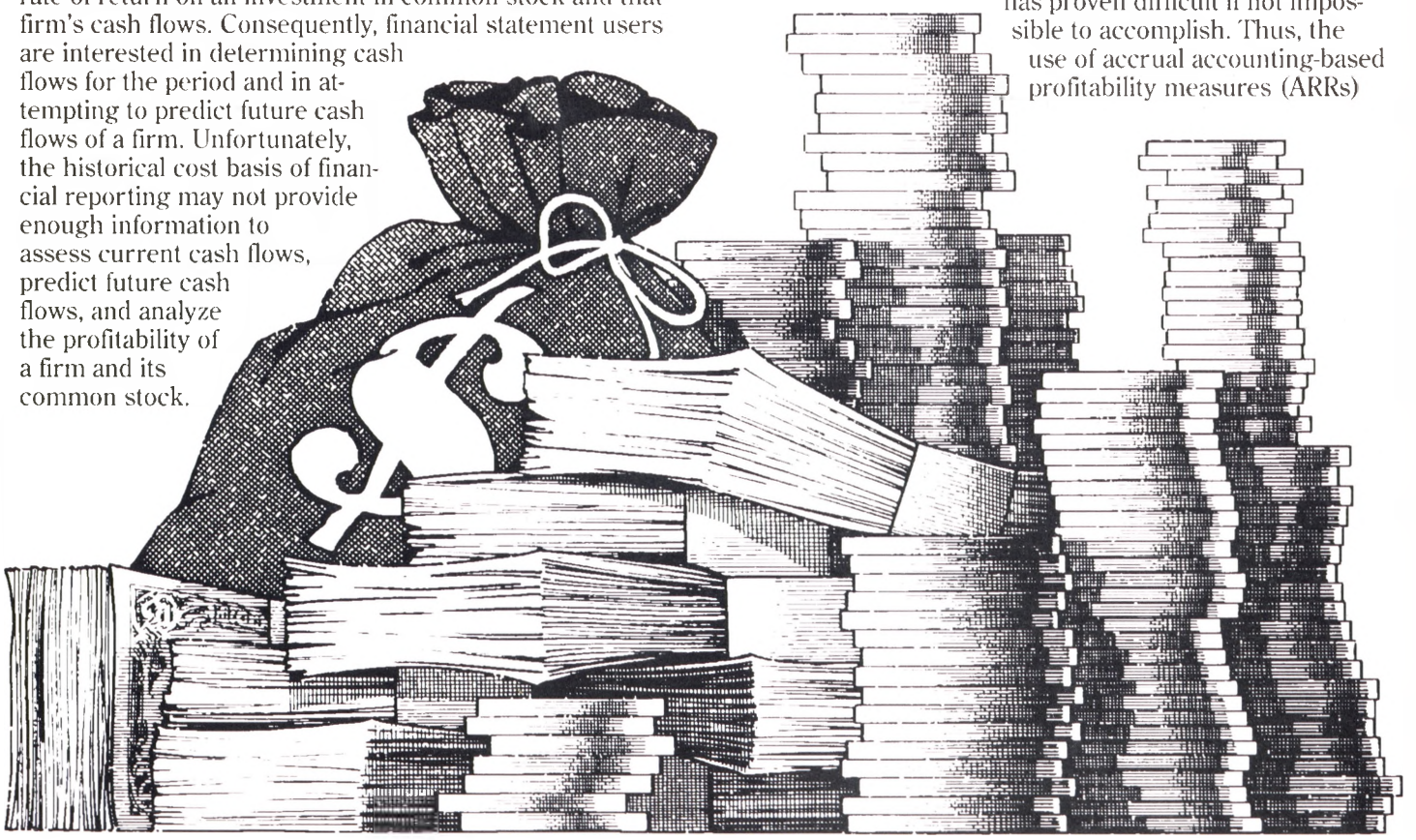
Recent attempts of accounting policy makers to develop a conceptual framework for external reporting have emphasized investors' needs to evaluate firms' cash flow generating potential. The FASB statement on objectives stresses that financial reporting should provide information to help investors and creditors in assessing the amounts, timing, and uncertainty of cash flows. In addition, the FASB has argued that the market price of a common stock incorporates the market estimate of the discounted cash flows from the firm to its investors. Since these distributions are dependent upon the cash generation capability of the firm, the market must assess the amounts, the timing, and the uncertainty of future cash flows. Thus, there is a direct link between an investor's rate of return on an investment in common stock and that firm's cash flows. Consequently, financial statement users are interested in determining cash flows for the period and in attempting to predict future cash flows of a firm. Unfortunately, the historical cost basis of financial reporting may not provide enough information to assess current cash flows, predict future cash flows, and analyze the profitability of a firm and its common stock.

Evaluating Firm Profitability

At present the accounting rate of return (ARR) is the most commonly used measure in evaluation of a firm's profitability. The ARR, which is the ratio of net income to net assets, is used primarily because it is easy to compute and understand. However, the internal rate of return (IRR) is a better measure of profitability than the ARR.

The IRR can be defined as the "true" interest yield by an investment project over its useful lie. It is the cash rate at which the discounted present value of future cash flows is equal to the current investment. A number of studies have attempted to estimate the IRRs of companies from published financial statements. In spite of these efforts, the computation of firm-specific IRRs by external parties has proven difficult if not impossible to accomplish. Thus, the use of accrual accounting-based profitability measures (ARRs)



were justified, since cash flow based surrogates for the IRR and other alternative profitability measures were not readily available.

Ijiri introduced the cash recovery rates (CRRs) as possible surrogates for IRRs in 1978. He found that if certain conditions related to the average life of fixed assets, the size of the firm, and the stability of CRRs were met, the CRRs could be used to approximate the IRRs. Using a cash flow variable in the evaluation of managerial performance is superior to an accrual approach, since it may be assumed that management invests the firm's resources based on discounted cash flow (net present value) analyses. Thus, the evaluation of managerial or firm performance should logically be based on cash flows rather than earnings.

In this paper we first discuss the CRR concept developed by Ijiri. We then the address the usefulness of CRRs in the analysis of a firm's profitability by: (a) testing the stability of the CRRs under the conditions suggested by Ijiri, and (b) discussing how these empirical results show that the CRR model is generally valid when a firm displays certain financial characteristics.

Usefulness of Cash Flow and Recovery Rates

The ideal measure of the value of a firm can be thought of as the present value of the cash inflows generated by the firm's operations. Research in accounting, economics and finance has consistently shown that the efficient functioning of capital markets depends upon reliable predictions of net cash flows and the discount rates specific to an individual firm or group of firms.

The management of a firm will have access to various information in making investment decisions. Internal investment decisions are generally based upon the ability of a project to generate sufficient cash flows to provide at least a minimum rate of return. Given a choice between alternative projects with relatively equal levels of risk, management will select those projects with the highest return above the minimum or hurdle rate. Investors and creditors, who view the firm as the aggregate of its projects, need similar information on internal rates of return and cash flows in order to value the firm.

However, current financial reporting rules require that audited financial statements be prepared using accruals and historical cost information, thus giving prominence to income measures. The resulting financial information is therefore influenced by choices of accounting methods (e.g., depreciation and inventory valuation methods) and may not be as useful in predicting future cash flows.

Ijiri asserted that the investors needed to have information on the cash recovered (generated) by all of the firm's projects in order to predict the firm specific IRR. The knowledge of cash flow patterns of the firm's individual projects was not necessary. Cash recoveries were defined as cash from operations, plus the proceeds from disposal of long term assets, plus interest expense (net of tax). This cash recovery was then divided by gross assets which were defined as average total assets plus accumulated depreciation for the period. Thus,

Cash Recovery Rate = Cash Recoveries/Average Gross Assets.

The recovery rate represents the reciprocal of the payback period, and allows one to measure the return on the firm's portfolio of investments. Moreover, the cash recovery rate can easily be computed from published financial statements.

The Stability of CRRs

Previous studies have shown that most large and mature firms included in their analyses displayed stable CRRs over time. The existence of some degree of stability may be desirable, because it may be assumed that managers of successful firms try to achieve at least the overall return rate originally used by them as a bench mark for investment decisions. Thus, individuals computing CRRs may assume that at the very least, the stability assumption holds for large and mature firms. Indeed, Ijiri implicitly assumed that large firms (various asset size thresholds can be used to define "large") with average useful asset lives of 15 years or longer and payback periods of 7 years or less (a CRR of 14 percent or more) would have relatively stable CRRs.

A stable CRR implies that a firm or a division of a firm can be viewed as one investment without regard to the cash flow profiles and useful lives of individual projects comprising it. Then, the CRR concept can operate at the aggregate level rather than at the individual project level. Over the average useful life of the firm's

'Testing the Stability of CRRs Under the Conditions Specified in Ijiri's Model

We examine the stability of CRRs in order to: (a) generalize Ijiri's arguments by including a large number of companies in the analysis; (b) observe whether the CRRs are stable with regard to size; and (c) relate the project lives and CRRs of firms to the stability of CRRs. The objectives of this analysis is to determine: a) the conditions under which an investor can assume safely that the CRR is equal to the IRR, and b) when caution must be exercise in equating the CRR to a firm's profitability.

First we replicate Ijiri's work for the 1972-1978 period for 20 firms. Using financial statement information obtained from COMPUSTAT tapes, we have achieved similar results. This exercise indicates that CRR can be defined in terms of COMPUSTAT items and computed by users of financial statements, especially by financial analysts.

Next we observed whether companies achieved a stable CRR over time. First, for the period of 1974-1987, we computed the CRRs of all non-regulated companies that reported data for each of the fourteen years in the COMPUSTAT tapes. There were 1,090 such companies. We then computed the average (mean) and the standard deviation of the CRRs for each firm.

If management achieves a relatively stable CRR, the differences between individual CRR observations and their average (mean) would be small. We used a 95 percent confidence level in testing this hypothesis.

Standardizing the CRRs, we computed that a firm having a small standard deviation (0.51 percent) will have all its CRRs within one percentage point above or below its average CRR. For a two percentage point difference, the standard deviation must be at most 1.02 percent and 1.53 percent for a three percentage point difference. Thus, a firm with a 12 percent average CRR and a standard deviation of 1.00 percent will have all of its CRR observations in the 10-14 percent range.

Finally, we tried to determine whether or not the firms with highly stable CRRs had common characteristics. In order to achieve this objective we classified the 1,090 firms by their standard deviations into two categories: stable (below or equal to 2.04 percent) and unstable (above 2.04 percent). We then observed their industry classification codes (SICs), total assets,a dn project lives since Ijiri indicated a possible relationship between the stability of CRRs and large and mature firms. Industry membership was observed to see whether CRRs were uniformly stable in certain industries and not in others.

assets, individual project cash flows and their fluctuations are averaged over all projects.

When CRRs are stable, it is possible to assume that increases (growth) in investments, whether in real or nominal terms, are managed along with growth in cash recoveries so as to maintain or to increase the CRR. Mathematically, it can be shown that under such conditions one can equate the CRR to a firm's profitability, that is, CRR = IRR.

In the final analysis, the external validity of the assumptions of the CRR model can be observed empirically only. Thus, empirical analyses could address the following general questions: (a) Are cash recovery rates stable? and (b) Do these conditions universally exist in large and mature firms, as it is assumed by others? If these questions can be answered in the affirmative, IRRs (i.e., profitability) of such firms can be estimated. The test methodology is discussed in footnote 1.

Results

The test for stability of the CRRs produced 248 firms that had standard deviations of 2.04 percent or less. An examination of the stable group yielded the following results:

1. The 248 companies were scattered among all industries and only five SICs had 5 or more firms classified in them (grocery stores, department stores, drugs, chemicals, and computers).
2. 197 of the total 248 firms had both average project lives greater than 15 years and asset size greater than $100 million.
3. Only 6 of the remaining 51 firms had both average project lives less than 15 years and asset size less than $100 million.
4. The average CRR of the entire sample was 14.1 percent, with most firms showing above average CRRs.

An examination of the unstable group (842 firms) showed the following results:

1. There was no pattern of industry membership.
2. 366 firms out of the total 842 reported either average project lives of 15 years or more or asset sizes of more than $100 million. Firms with unstable CRRs that had both 15 years or more average project lives and $100 million or more asset size numbered 73 out of 366.
3. The remaining 476 firms showed both asset sizes of less than $100 million and average project lives of shorter than 15 years.
4. The average CRR of this sample was 10.73 percent with a range of 3.10 to 22.37 percent.

The results reveal an unmistakable pattern of conformity with model assumptions. Firms with assets over $100 million, average project lives of 15 years or more, and CRRs of 14 percent or more, exhibit stable CRRs most of the time (197 stable versus 73 unstable), while firms with the opposite characteristics generally exhibit unstable CRRs (6 stable versus 476 unstable). Finally, firms lacking one or more of these characteristics generally show unstable CRRs (45 stable versus 293 unstable). Thus, the accurate prediction of instability is more probable when some or all of the model assumptions are lacking than the accurate prediction of stability when all of these assumptions are present.

Concluding Comments

For the firms that exhibit stable CRRs and are large and mature, investors can use the CRR as the firm specific discount rate and profitability measure (i.e., IRR). However, for firms that exhibit various degrees of instability in their CRRs, caution must be exercises when CRR is used to estimate the IRR. In such instances, a determination of a number of CRR observations may be necessary coupled with simple or complicated forecasting approaches. Even then, the availability of a profitability analysis measure that is based on cash flows rather than accounting constructs must be comforting to users of financial statements. We believe investors will find that CRRs are more useful in evaluating firms' cash flows and profitability than ARRs.

Ara G. Volkan *is Professor of Accounting at West Georgia College. He is a member of the AAA and NAA.*

Joseph C. Rue, *CPA, is an Associate Professor of Accounting at Syracuse University. He is a member of the AAA and AICPA.*

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