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Firm and Industry Effects in Accounting versus Economic Profit Data

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Abstract

This article presents estimates of firm and industry fixed-effects on profit rates for large US corporations, using both Economic Value Added (EVA), the popular measure of profits produced by Stern Stewart and Company, as well as simple (unadjusted) accounting measures as the dependent variable. We find that the improvement in explanatory power of the fixed-effect model is substantially greater when using EVA than has been documented with alternative measures.

1 Introduction

The debate over whether accounting measures of profits are useful proxies for firm performance goes back at least two decades in the industrial organization literature. Franklin Fisher and John McGowan (1983, p. 90) argue that, "…there is no way in which one can look at accounting rates of return and infer anything about relative economic profitability…" Similar arguments can also be found in the accounting and finance literatures. Commenting on the corporate scandals of the late 1990s, G. B. Stewart (2002, p. 1) argues that, "The real issue is not that a handful of companies like Enron,

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Tyco and WorldCom broke rules to inflate their earnings–despicable as that is–but that almost every company nowadays bends bookkeeping to smooth its earnings and meet analyst expectations."

Partly as a result of these types of criticisms, numerous methods of adjusting profit measures have been created, for both academic use and use in industry. On the academic front, Kapler (2000) has recently proposed an "Economic Accounting Rate of Return," or EARR, which is an adjusted accounting measure of firm performance. In particular, she makes several adjustments to accounting rate of return, "…to incorporate more economically appropriate treatment of interest payments, depreciation, intangible assets, and asset valuation methodology." (p. 462) She finds that, in a simple fixed-effect model including both firm and industry effects, the R-squared is substantially higher when EARR is used as the dependent variable.

On the industry front, Biddle et al. (1999 p. 71, n. 7) describes the profusion of measurement products offered by consulting firms: "Performance measures marketed by competing firms include cash-flow return on investment (CFROI)…total business return (TBR)…shareholder value added (SVA)…discounted economic profits (EP)…, and economic value management (EVM)…" Myers (1996) discusses the "metric wars" between companies offering these various profit measures, and presents data indicating that the most popular in this class of profit measures is economic value added (EVA), produced by Stern Stewart and Company. To our knowledge, no systematic appraisal of any of these measures has been documented in the academic literature. This paper aims to partially fill this gap by pitting the explanatory power of EVA versus that of unadjusted accounting measures, in a firm and industry fixed-effect model.

We are interested in a similar question as one posed by Kapler (2000). In particular we ask, How much better will the fixed-effect models perform when using EVA rather than simple accounting measures of profits?[2] Whereas Kapler's (2000) measure makes only a few adjustments, Stern Stewart Company, in calculating EVA, makes many mores. Given all of the extra effort that goes into calculating EVA, one would think that the performance of the fixed-effect models should be even better when EVA is used as the dependent variable. As we will discuss, when EVA is used, the models perform about 300% better compared to when unadjusted profit measures are used. This is a remarkable improvement compared to that found by Kapler (2000), whose measure achieved an improvement of only about 50%.[3]

A secondary contribution of our study is to shed light onto the relative importance of firm versus industry effects on profit rates. There is a large literature on this topic which we do not review here, though see Kapler (2000) for a discussion. Suffice it to say that our results almost perfectly coincide with hers: firm effects alone explain about three times as much as industry effects alone. This is true regardless of the measure used. In this sense, even though accounting measures may be prone to many of the biases Fisher and McGowan (1983), Stewart (1999) and others discuss, it may still be the case that the *qualitative* characteristics of markets can be uncovered using simple accounting measures of profits (a similar point is made by Mueller, 1990, pp 8-14).

The outline of this paper is as follows. In the next section, we briefly discuss EVA and how it is calculated. Then we describe our data and methodology, and present

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[2] What we call simple profit rate measure is net income plus interest over total assets, directly from the firm's reported profit and loss statement and balance sheet. EVA, as we describe below, is a much more complicated measure of profits.

[3] Kapler (2000) actually finds a higher R^2 than we do, but the *improvement* in fit is larger in our study.

our results. A brief conclusion reiterates the main implications and discusses directions

for future research.

2 Accounting versus Economic Profit, and EVA

In this section we briefly describe accounting versus economic measures of

profits, and EVA. Stern, Stewart and Co. produces the data for our analysis, see Stewart

et al. (1995). Accounting profit (net income) does not take into consideration the

opportunity cost of capital, while economic profit does. EVA is an attempt to measure

economic profit, and is given by:

(1) $EVA_t = C_t - r\,K_t$

where C_t is cash flow in period t, r is the opportunity cost of capital and K_t is the value of

capital the firm utilizes, i.e. the accumulated investment less depreciation. C_t takes into

account all revenues and expenses except the opportunity cost of capital, which is what

accounting profit measures. However the measurement of EVA from accounting data is

not as straight forward as equation (1) suggests. The following relationship measures

EVA:

EVA = Cash flow from operations [a]

+ Accruals (revenues earned but not received or expenses incurred but not
paid) [b]
+ After tax interest added back to get operating performance before
financing costs [c]
- Capital charge -- current cost of debt and equity [d]
+ Adjustments made by Stern Stewart to correct accounting distortions [e]

Net income before extraordinary items = [a]+[b]
Net operating profits after taxes, NOPAT = [a]+[b+[c]

EVA = [a]+[b+[c] +[d]+[e]

The numerous adjustments made by Stern Stewart (represented by component [e]), are an attempt to correct what accounting fails to do. Figure 1 demonstrates some of these accounting limitations, and the types of adjustments made to correct them.

Figure 1		
Area	*GAAP**	*Adjustments*
Advertising	Expense: the entire expenditure is deducted during the period it occurs	Record as asset and amortize over several years
R&D	Expense	Record as asset and amortize over several years
Bad debt	Estimated accruals	Reverse the accruals to reflect cash basis reporting
Inventory	Last-in-First-out (LIFO)	Convert to First-in-first-out (FIFO)

*GAAP: generally accepted accounting principles; for more detail see Biddle et al. (1999).

3 Firm and Industry Effects on Rate of Return

Many studies have attempted to explore the relative importance of firm versus industry effects in explaining firm performance. Some studies (Schmalensee, 1985; Rumelt, 1991) find that industry effects dominate, whereas other studies (Cubin and Geroski, 1987; Mueller, 1990) find that firm effects dominate. To shed additional light on this question, and to provide a platform for an econometric horserace between EVA and unadjusted accounting measures (which we denote below as return on assets, or ROA), we follow Kapler (2000) and estimate a firm and industry fixed-effect model.

Table 1 below presents the results of a simple fixed-effects OLS regression on the panel data of 331 firms for the years 1989-2003.[4] These 331 firms are basically all firms from the Stern Stewart Performance 1000 database that could be matched with data from

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[4] Some differences between our data and Kapler's are that 1.) firms in her sample were manufacturing firms our firms are large corporations, 2.) she has 562 firms in her sample compared to our 331, and 3.) we use more recent data and have15 years of data compared to her six years.

Standard and Poor's Compustat database, and for which data were available for all years in both data sets. The dependent variable is alternatively ROA or EVA. For each of the dependent variables, model (1) is a restricted model demonstrating the fixed effects of firms only; model (2) demonstrates industry fixed effects only;[5] and model (3) combines industry and firm effects.[6]

Table 1. Firm and industry effects

Dependent variable	(1) Firm effects only	(2) Industry effects only	(3) Firm and industry effects
ROA			
Intercept	0.073	0.083	.065
F-ratio	4.273	5.988	4.032
R2	0.20	0.064	.223
Adj R2	0.153	0.053	0.168
EVA			
Intercept	0.021	0.032	.025
F-ratio	16.281	17.65	16.267
R2	0.487	0.168	.537
Adj R2	0.458	0.158	0.504

For both dependent variables, firm effects dominate industry effects, but both types of effects are significant. When the dependent variable is ROA, fixed firm and industry effects combined explain 17 percent of the variation in firm performance. However when EVA is the dependent variable, almost 50 percent of the variation in firm profitability is explained by industry and firm characteristics. This constitutes a dramatic increase in explanatory power compared to ROA.

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[5] Firms were grouped into industries based on their three digit SIC code.
[6] To be precise, model (3) includes all industry dummies (but one). However, to avoid multicolinearity when estimating (3), we dropped the firm dummy in cases where industries were represented by only one firm. For the industries represented by more than one firm, we also dropped one firm's dummy per industry (on the basis of whichever firm came firms in alphabetical order.) Model (1) then includes only those firm dummies that were included in (3).

4 Conclusion

Kapler (2000) advised researchers in industrial organization and strategic management to adjust ROA to incorporate more economically appropriate treatments of accounting measures of profits. Our findings using EVA suggests that, rather than putting the weight of adjusting accounting measures on the researcher, already existing profit measures can be useful for theoretical inquiry. Of course this recommendation remains tentative, pending exploring profit measures in more complicated models.

5 References

Biddle, G.C., Bowen, R.M. and J.S. Wallace. 1999. Evidence on EVA. *Journal of Applied Corporate Finance*. 12, 2.

Cubbin, J., and P. Geroski. 1987. The convergence of profits in the long run: Inter-firm and inter-industry comparisons', *The Journal of Industrial Economics*, **35**, 427–442.

Fisher, F. M. and J. J. McGowan. 1983. On the misuse of accounting rates of return to infer monopoly profits. *The American Economic Review*, 73, 1, 82-97

Kapler, J.K. 2000. Measuring the economic rate of return on assets. *Review of Industrial Organization*. 17, 4, 457-463.

Mueller, D. C. 1990. *The Dynamics of Company Profits: An International Comparison.* Cambridge, U.K.: Cambridge University Press.

Myers, R. 1996. Metric Wars. *CFO*, Vol. 12, 41-50.

Rumelt, R. P. 1991. How much does industry matter? *Strategic Management Journal*, **12**, 167–185.

Schmalensee, R. 1985. Do markets differ much? *American Economic Review*, **75**, 341–351.

Stern, J., Stewart, B. and D. Chew (1995). The EVA financial management system. *Journal of Applied Corporate Finance*, 8, pp. 32-46.

Stewart, G. B. 2002. Accounting is broken, here's how to fix it: A radical manifesto. EVAluation, 5, 1, pp. 1-31.