THE RELATIONSHIP BETWEEN ECONOMIC VALUE ADDED (EVA), AND THE STOCK MARKET PERFORMANCE OF AGRIBUSINESS FIRMS

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the exception of accrued taxes payable and the current portion of long term debt, trade payables would, on an accrual basis, already be included as an expense in the measure of profit, so excluding them will avoid some obvious double counting.

Why EVA?

EVA's proponents claim that by following a simple rule which stipulates that at all stages of production in all corporate divisions the EVA should be positive and maximized, then all internal decisions will gravitate towards that goal. By definition, EVA deducts from after-tax cash profits an opportunity charge against the assets employed. In other words, the proponents argue that it is not sufficient for a corporation to claim shareholder wealth maximization on earnings per share (or any other metric) alone. Since through their direct investments in fixed assets and

working capital and the deferral of dividends to pay down debt, shareholders finance those assets and should be rewarded for doing so.

Anecdotal evidence exists to support the relationship between EVA and firm performance. Specifically, the advantage of EVA is that it tends to identify specific idle assets or, from a portfolio of assets, identify those which provide the lowest economic return. Consequently, EVA can be raised by

1. earning more profit without using more capital,
2. using less capital, and/or
3. investing capital in high return projects.

According to the consulting firm Stern Stewart and CO., large blue chip companies such as Coca-Cola, AT&T, Quaker Oats, Briggs and Stratton and other consumer goods-manufacturing companies have successfully used EVA to measure the economic performance of [2]business units and management's performance. Indeed EVA, the tool, is viewed as being quite pragmatic. For example,

[2]See "The Real Key to Creating Wealth," by Shawn Tully, Stern Stewart and Co., Http://www.eva.com/publications/

Tully in his paper cites Coca-Cola CEO Roberto Goizveta; "We raise capital to make concentrate and sell it at an operating profit. Then we pay the cost of that capital. Shareholders pocket the difference." The remarkable truism is that managers in general do not know how much capital is tied up in their group, division, or department an, in a world defined by goals written in an annual budget, probably don't care as long as operations fall within the budget variance. By understanding the direct and opportunity cost associated with capital employed, managers, as the following example illustrates, are better prepared to make shareholder maximizing decisions.

- CSX, a shipping/transportation company, increased freight by 25% while reducing the number of shipping containers by 4,000 and the number of locomotives by 50. They did this by noting that a given train requiring 4 locomotives and travelling 28 mph would arrive at its destination 4-5 hours before it could be unloaded. Using 3 locomotives travelling 25 mph would increase travel time by 3 hours, but that time was idle. This thinking reduced capital employed by $70 million.
- Briggs and Stratton once took great pride in its ability to manufacture small engines but this pride did not compensate for a 7.7% return on capital when the cost of that capital was 12%. Briggs and Stratton allowed managers to out/source the manufacturing of some parts where the costs of in-house resources were just too high to justify the capital expenditure.
- AT&T's tradition before using EVA was to provide divisional balance sheets for only six of its business units, including long-distance services and telephone equipment. For divisions such as 800 services, capital employed was aggregated somewhere within a higher order grouping. Because of the specificity of EVA, more than 40 different business units have their own individual or enterprise-based balance sheets and each know exactly how much capital is being employed in providing the specific service.
- Coca-Cola, whose CEO lives by the maxim "the one with the biggest cash flow wins!" used a three pronged approach to maximizing EVA. First, capital was concentrated on the more profitable soft drink business, selling off assets from a bygone era of conglomeration into such things as pasta, tea, wine, desalinization equipment, and plastic cutlery. Second, noting that equity capital was expensive relative to debt and that Coca-Cola was (in 1987) relatively debt free, the company borrowed for expansion, thereby lowering the average cost of capital from 16% to 12%.
- Quaker Oats used to provide significant premiums or price discounts to channel partners and retailers to encourage them to load up on Quaker Oat's products. By encouraging retailer purchases, especially at the end of each quarter when earnings reports had to be supplied, huge amounts of inventories had to be held and huge warehouses were required for storage. After the so-called "trade loading" many warehouses were nowhere near capacity, yet significant overhead costs were incurred by idle warehouses, and significant working capital was employed during the routine build-up of quarterly inventories.
- In response to EVA, Quaker Oats ended the trade-loading policy, reduced inventories by $6 million while increasing sales, and closed 5 of 15 warehouses saving an additional $6 million.
- Varity Corp., which manufactures farm equipment, trained 3,500 European employees in EVA and solutions were provided to problems never recognized and questions never asked. One worker recommended closing an entire warehouse to reduce inventory, lamenting that if Varity increased capacity to the size of a football field they would fill it, as they would if they were provided the warehousing capacity of a closet.

Notwithstanding such anecdotal evidence, there are still questions regarding the general ability of EVA to create and measure wealth and increase shareholder value. For example, in the above examples firm or shareholder wealth has apparently increased because new resources were used to pinpoint high EVA opportunities, and maintained resources were used to massage already-high EVA projects. But is EVA simple hype? According to some proponents EVA is more than a management tool. It is a real metric that may be used to evaluate company performance and to predict returns to shareholders in the future. Share prices have been shown to be highly correlated with high EVA.

An opposing view is that there is nothing remarkable about EVA. If EVA is value creating then it should correspond to Net Present Value (NPV) and thus share value. Correspondence with NPV depends upon how EVA is measured. If earning before interest and taxes, but without depreciation is used as the earnings measure then the correspondence is direct; the present value of EVA over the life of the project will exactly equal the NPV. If, as EVA is so commonly defined, net operating profits are used before depreciation then there will be an implicit bias in EVA equal to the present value of the depreciation tax shield.

To see this, consider a single period investment with time = 0 cost of I, pre-tax operating earnings before depreciation of A, tax rate t, and a cost of capital i. The NPV is given by

$$(5) \qquad NPV = -I + \frac{A(1-t) - It}{(1+i)}$$

The corresponding EVA measure using net after-tax operating profits before depreciation is

$$(6) \qquad EVA = A(1-t) - iI$$

and its present value is

$$EVA^* = \frac{A(1-t) - iI}{(1+i)}$$

Subtracting NPV from EVA* yields

$$(7) \qquad EVA - NPV = -\frac{I(1-t)}{(1+i)} < 0$$

which is equal to the present value of the after-tax investment cost. Of note is the observation that EVA will consistently undervalue the firm relative to NPV.

Alternatively if it is assumed, as in Higgins, that earnings before interest and taxes is used rather than real operating profits then EVA can be restated as

$$(6b) \qquad EVA^{**} = \frac{(A-I)(1-t)-iI}{(1+i)}$$

$$= -I + \frac{A(1-t)-It}{(1+i)}$$

$$= \text{NPV}$$

Equation (6b) is identical to equation 5, the Net Present Value. The result shows that if earnings before interest is used as the after tax profit measure there should be a direct correspondence between NPV and EVA.

The difference between (6) and (6b) is significant! If stock prices increase in direct correspondence to the present value of future cash flows, and EVA is also supposed to correspond with increased share value then a theoretical conflict occurs, and hence would not be able to provide the same predictability of stock market behaviour. In fact, the depreciation bias may be sufficiently high to thwart any possibility of measuring the effectiveness of EVA.

Table 1 provides an example to show the EVA depreciation bias. Two mutually exclusive projects (A and B) are under consideration. Both cost $1 million, have a useful life of ten years, straight line depreciation ($100K/year) and no salvage value. The relevant cost of capital is 12%.

Table 1: EVA and NPV Compared

Project A Time	Operating Income	Net Income After Tax	Cash Flow	EVA Including Depreciation	EVA Excluding Depreciation
0			-1,000,000		
1	325,000	225,000	235,000	15,000	75,000
2	422,500	322,500	293,500	85,500	145,500
3	549,250	449,250	369,550	173,550	233,550
4	714,025	614,025	468,415	284,415	344,415
5	928,233	828,233	596,940	424,940	484,940
6	1,206,902	1,106,702	764,021	604,021	664,021
7	1,568,713	1,468,713	981,228	833,228	893,228
8	2,039,327	1,939,327	1,263,596	1,127,596	1,187,596
9	2,651,125	2,551,125	1,630,679	1,506,675	1,566,675
10	3,446,462	3,346,462	2,107,877	1,995,877	2,055,877
NPV			2,951,240	2,951,240	3,290,253
Project B					
0			-1,000,000		
1	75,000	(15,000)	85,000	-(135,000)	(75,000)
2	123,750	14,250	114,250	(93,750)	(33,750)
3	204,188	62,513	162,513	(33,488)	26,913
4	336,909	142,146	242,146	58,146	118,146
5	555,900	273,540	373,540	201,540	261,540
6	917,236	490,341	590,341	430,341	490,341
7	1,513,439	848,063	948,063	800,063	860,063
8	2,497,174	1,438,305	1,538,305	1,402,305	1,462,305
9	4,120,338	2,412,203	2,512,203	2,388,203	2,448,203
10	6,798,557	4,019,134	4,119,134	4,007,134	4,067,134
NPV			3,229,903	3,229,903	3,568,917

The results in Table 1 illustrate the relevant economic relationships. Project B has a higher NPV at the 12% discount rate. However, the EVA for Project A exceeds that of Project B for 7 of the 10 years. If management's focus in on higher EVA sooner than later then Project A would be the optimal choice as it would show higher EVA in the early years. This would be attractive to a young manager seeking promotion, but would be myopic in terms of personal and corporate benefits at the present value,

the EVA is equal to the present value of NPV. Consequently a non-myopic manager would clearly choose B, the higher of the two project NPVs.

In the last column of Table 1, the EVA is computed according to the Stern-Stewart guidelines of net operating profits after tax and excluding depreciation. The bias is self evident as this measure has a higher EVA than the NPV - equivalent EVA. The difference in the EVAs is exactly equal to the present value of after tax investment flow including depreciation and its tax shield ($339,013 for both projects). Importantly this will tend to overstate the true EVA which maximizes the present value of the fir, and it is this bias which might cause significant discrepancies between actual stock market behaviour and EVA. This is important in this study because the EVA measurement is the Ster-Stewart measure, and the specific empirical tests are directed toward EVA as a profit metric as well as a share value metric.

There is a general admission by financial authorities and practitioners that EVA definitely has managerial value, but because EVA emerged from industry rather than academia, research on the subject has been fairly limited and not very conclusive one way or another (Dillon and Owers)[3]. Kramer and Pushner[4], evaluated EVA and net operating profit after tax as explanatory determinant of Market Value Added (share value plus market debt less book value of assets employed) and found that market value was better explained by net operating profit after tax (NOPAT) than EVA under several scenarios. The implication is that cash likely matters more to investors than economic profits. EVA proponents (e.g., Stern-Stewart) have countered with the argument that EVA's measured performance depends on how it is measured, and that any evaluation should also consider future EVA values and in doing so EVA explains more of the variation in Market Value Added than NOPAT (Ó Byrne pages 50-54.)

Still, there appears to be a dichotomy in thinking on what is actually creating value. The traditionalist view of corporate finance is that it is cash flow and only the future prospects for cash flow that matters when creating shareholder value, whereas EVA proponents are very much focused on asset generated profits. Peterson and Peterson using annual data from 1988 through 1992 evaluated a host of economic performance measures such as return on assets, cash flow and Tobin's Q. Relative to a stock

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[3] Kramer, J.K. and G. Pushner "An Empirical Analysis of Economic Value Added as a Proxy for Market Value Added" Fin. Pract. & Educ.- Spring/Summer:41-49.

[4] R.D. Dillon and J.E. Owers "EVA as a Financial Metric: Attributes, utilization, and relationship to NPV" Financial Practice and Education C Spring/Summer 1997,:32-430.

return benchmark metric, the authors conclude that EVA type measures do not provide much more information than stock prices and attribute this to size bias, events outside of management's control, reliance on accounting information and sensitivity to changes in the cost of capital.

Bacidore, *et., al,* test EVA against share value[5]. They found that EVA was positively tied to share value, but after they adjusted EVA to reflect market values of capital employed, they found EVA to be less informative. Once again the reliance of book value in EVA was deemed to be the cause. They argue that markets moved when stock returns were above or below their expected market return for risk and such risk discounting adjustments are not adequately represented by single period book earnings.

ASSESSING THE EVA METRIC FOR AGRIBUSINESS FIRMS

The preceding discussion raises two important issues, EVA may overstate firm value and EVA might not be any better as a signal than some standard financial ratios. To examine these issues, 17 Canadian based agribusiness firms listed on various Canadian stock exchanges were examined. For each firm, the 1996 fiscal EVA was computed from the company's 1996 annual report and these were divided by the number of shares outstanding. To compare the viability/superiority of the EVA metric to other common performance measures, data was also collected for the return on Asset (ROA), Return on Equity (ROE) and Return on Sales (ROS) for 1996 as well as the 3-year (1994-1996) averages. Each company was then ranked from 1 through 17 on each measure. A consistent EVA should be highly correlated in rankings with the profitability measures as well as the efficiency measure of return on sales.

There are two key questions. 1. Are increases in share value are more highly correlated with EVA than other financial performance metrics? 2. Does implementation of EVA by management lead to an increase in value above expectations. It is the first question which is examined in this paper. From the financial analyst's perspective the key question is whether EVA actually leads to improved share value, and whether. To examine this issue daily stock prices were collected from June 1, 1996 through

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[5] Bacidore, JM., J.D. Boqust, T.T. Milbourn, and A.V. Thakor "The Search for the Best Financial Performance Measure" Financial Analysts Journal 53(3), 1997: 11-20.

Peterson, P.P., D.R. Peterson "Company Performance and Measures of Value Added" The Research Foundation of the Institute of Chartered Financial Analysts, 1996.

June 1, 1998. These prices were obtained through Market Watch Canada. From these prices the daily change (% return) to holding the shares was computed and the average daily change was annualized to a 251 day yearly rate. In theory, a high EVA share should correspond to increased growth in the stock price and should contribute to share value.

EVA and the Market Model

Consistent with the previous discussion, the capital Asset Pricing Model can be used to determine the efficiency of EVA as it relates to long term stock market returns. Defining the daily rate of return as

(9) $(S_t - S_{t-1})/S_t = r_{it}$

for company i, and the daily return on the diversified TSE300 (Toronto) index as r_{mt}, single index measures of systematic risk (betas) can be computed from the least square regression,

(10) $r_{it} = \%_i + \beta_i r_{mt} + e_i$.

In (10), β measures the systematic relationship between individual stock returns and the market and $_{ei}$ is an error term. Using this characteristic equation, the total variance in stock returns can be decomposed into its systematic (non diversifiable risk) and non-systematic (diversifiable risk) components as

(11) $\sigma_i^2 = \beta i^2 \sigma_m^2 + \sigma_\kappa^2$.

Both sources of risk are relevant to the assessment of EVA. First, a high EVA company would be viewed in the market as having lower systematic risk, and second, by the very actions that generate high EVA, companies ought to be able to see a significant reduction in nonsystematic risk as well. Hence, it is hypothesised within the framework of CAPM that high EVA firms have less systematic and non systematic risk than low EVA firms. Furthermore, upon implementing the security market line (SML) equation, with market return r_m and risk free returns r_f,

(12) $E[r_i] = r_f + \beta[r_m - r_f]$

According to equation (12), the expected cost of equity should be lower for high EVA firms. In this context, the predicted outcome from the SML does not indicate profitability in the sense of accounting returns to equity, but as the cost of equity capital charged to investment projects. Consequently, if one considers the present value of future cash flows, A, as the determinant of stock prices then

(13) $E[S_i] = A/E[r_i]$,

and a lower risk adjusted cost of capital will lead to an increase in the stock price.

Excess returns to risk are conveniently defined within the CAPM framework as significant deviations from long run equilibrium values as defined in the security market line (equation (12)). In this study we make a different interpretation and segregate above-equilibrium returns to non-systematic risk. Defining r_{it} as the random rate of return and r* as the long term equilibrium rate of return the r_{it} - r_i* would represent a short run excess return if it is positive, and a short run deficiency if it is negative. The total risk assigned to r_{it} is σ_i^2, and the total risk assigned to r_i* is $B_i^2\,\sigma_m^2$. Short run deviations measured by r_{it} - r_i* must then be measured by the residual risk $\sigma_i^2 - B_i^2\sigma_m^2$ which is the non-systematic risk. In other words, excess returns must reflect the marginal (non-systematic) risk of the individual stock outside of the market portfolio and it is therefore prudent to attribute these returns to nonsystematic risk alone.

A more precise mathematical statement of the above can be drawn by defining, identifying the two components of r_I,

(14) $r_i - r_i^* + (r_i - r_i^*)$.

By definition, it must be true that

(15) $\sigma^2(r_i - r_i^*) = \sigma_i^2 - \beta_i^2\sigma_m^2 = \sigma_e^2 = nonsystematic\ risk$

and $\beta_i^2\sigma_m^2$ is the unambiguous risk sourced from the capital market. This allows us to define the coefficient of variation from market returns as

(16) $CV_m = r_i^* / \beta_i^*\sigma_m$

This coefficient of variation measures the equilibrium return r* as generated by the SML equation and

divides it by systematic risk. It would be anticipated that this ratio would be high as the mathematical tradeoff between r_i* and $\beta_i \sigma_m$ is linear. For excess returns, the coefficient of variation is defined as

(17) $$CV_i = (r_i - r_i^*)/\sigma_e *$$

One would expect that high EVA firms receive greater confidence from the market and therefore it would be expected that any short run alteration from equilibrium (i.e. r_1 - r_1*) would be small or would come with such high risk that CV_i would be small relative to CV_m. In other words, not only would one expect high EVA firms to be represented more efficiently in the market, one would also expect that the coefficient of variation based on the market model would be greater than the coefficient of variation from deviant returns and nonsystematic risk. In fact we would expect this to be general across all companies. To measure this relationship we create the ratio Z as

(18) $$Z = \frac{CV_m}{CV_i} = (r_i^* /(r_i - r_i^*)) * (\sigma_e / \beta_i \sigma_m).$$

One would expect greater risk efficiency in high EVA firms than low EVA firms and consequently Z should be highest for high EVA firms.

Analysis of Results

The empirical part of this paper focuses on two claims made in supporting EVA. The first claim is that EVA provides a superior metric of firm performance relative to conventional measures such as ROA, ROE, and ROS. The second claim is that high EVA firms show superior strength in the market place. To investigate these claims EVA/Share is compared to accounting and stock market measures of performance by a ranking methodology and then simple regression analysis.

The data in Table 2 represents the accounting information garnered from the 1996 annual reports. The corporations are listed in order of highest EVA/Share to lowest. The highest EVA company is George Weston Limited with EVA/Share of $3.125 and EVA of $139.07 million while the lowest is Schneider Corporation with EVA/Share of -$1.935 and total EVA of -$11.81 million. Table 2 also

shows why EVA/Share is a more appropriate measure than EVA when companies such as Saskatchewan Wheat Pool have a very high EVA of $51.63 million (ranked second) but because of the distribution of ownership the per share EVA is only $1.75 (ranked 4th).

Table 3 ranks each of the accounting metrics. It would be anticipated that EVA would provide a reasonable measure of performance which would correlate with other measures. As Table 3 shows this doesn't hold in all cases, but it can be said that high EVA/Share firms will generally have high measures of ROA and ROE while low EVA/Share firms have lower profitability measures. Hence, there is general consistency in terms of the EVA claims in this method. There are of course some exceptional outliers ; George Weston which is ranked 1 by EVA is ranked 7 based on ROA and ConPak Seafoods which is ranked 12th by EVA/Share is ranked 2nd by ROA, 3rd by ROE, and 3rd by ROS. In this case the 3 year average performance measures are more representative of EVA than the 1996 fiscal measures.

Table 2: Summary of 1996 EVA Analysis

Rank	Food Companies	Ticker	1996 EVA/Share	1996 EVA (Million$)	1996 ROA %	3 Year ROA	1996 ROE	3 Year ROE	1996 ROS	3 Year ROS
1	George Weston Limited	WM	3.125	139.07	5.35	4.46	18.02	15.24	2.29	1.79
2	Cambra Foods	CBF	2.149	6.07	11.01	7.82	24.15	18.74	1.156	1.02
3	Lassonde Industries	LAS.A	2.09	2.6	6.85	7.58	12.82	13.42	4.85	4.93
4	Saskatchewan Wheat Pool	SWP.B	1.746	51.63	6.55	5.64	10.31	9.69	1.17	1.09
5	National Sea Products Limited	NSP	0.529	3.82	2.44	2.34	11.55	14.71	1.39	1.37
6	Dover Industries Limited	DVI	0.321	1.1	4.74	6.87	6.88	9.34	2.65	3.8
7	XL Foods	XLF	0.275	3.2	8.47	7.24	14.87	14.94	1.18	0.96
8	FPI Limited	FPL	0.229	3.76	2.22	1.99	4.09	3.74	0.92	0.83
9	A.L. Van Houtte	VH	0.172	2.72	5.81	6.17	8.36	8.5	4.88	6.38
10	Maple Leaf Foods	MFI	0.119	8.45	3.36	1.98	16.8	3.86	N.A.	N.A.
11	Sun-Rype Products	SRF.B	0.093	0.89	3.76	2.92	8.33	6.71	2.08	1.6
12	ConPak Seafoods	CPQ	0.025	0.63	9.26	-11.4	17.83	-42.65	4.65	-7.58
13	Sepp's Gourmet Foods	SGO	-0.04	-0.32	2.48	2.49	4.86	4.68	1.47	1.5
14	TML Foods	TML	-0.05	-1.76	-20.84	-11.75	-96.07	-50.47	-14.62	-8.08
15	Canadian Agra Foods	CAF	-0.102	-5.28	-29.69	-18.34	-128.53	-62.08	-10.83	-6.43
16	Fletcher's Fine Foods	FFF	-0.196	-0.79	0.94	2.89	1.69	-4.41	0.21	0.49
17	Schneider Corporation	SCD.A	-1.935	-11.81	-3.87	0.69	-11.12	-1.33	-1.19	-0.22

Table 3: Ranking of EVA/Share to Profitability Metrics

Rank	Food Companies	EVA	1996 ROA	3 Year ROA	1996 ROE	3 Year ROE	ROS	3 Year ROE
1	George Weston Limited	1	7	7	2	2	5	4
2	Cambra Foods	4	1	1	1	1	7	9
3	Lassonde Industries	9	4	2	6	5	2	2
4	Saskatchewan Wheat Pool	2	5	6	8	6	11	8
5	National Sea Products Limited	5	12	11	7	4	9	7
6	Dover Industries Limited	10	8	4	11	7	4	3
7	XL Foods	7	3	3	5	3	10	10
8	FPI Limited	6	13	12	13	12	12	11
9	A.L. Van Houtte	8	6	5	10	8	1	1
10	Maple Leaf Foods	3	10	13	4	11	N.A.	N.A.
11	Sun-Rype Products	11	9	8	9	9	6	5
12	ConPak Seafoods	12	2	15	3	15	3	15
13	Sepp's Gourmet Foods	13	11	10	12	10	8	6
14	TML Foods	15	16	16	16	16	16	16
15	Canadian Agra Foods	16	17	17	17	17	15	14
16	Fletcher's Fine Foods	14	14	9	14	14	13	12
17	Schneider Corporation	17	15	14	15	13	14	13

Cross sectional significance was measured by a simple regression of each performance measure in Table 2 against EVA/Share. No corrections were made for heteroscedasticity. The intent of the regressions is to provide a simple test of the null hypothesis that there is no relationship between EVA/Share and financial performance measures.

The results in Table 4 indicate in all cases a general positive correspondence between EVA/share and the financial performance metrics. The statistics do not indicate significance but with a small sample of cross-sectional data the reliability of the statistics are dubious. Notwithstanding the alterations in ranking found in Table 3, the regressions support the general

notion of a positive correlation between EVA/Share and financial performance.

Accepting a relationship between EVA/Share and financial performance implies the following interpretation of the Table 6 results; a $1 increase in EVA/Share implies an increase of 3.345% in ROA, an 11.3% increase in ROE and a 1.3% increase in ROS. The difference in the marginal response between ROE and ROA would be due to capital structure and financial leverage, and because of this capital structure, the result is expected.

Unfortunately, the results in Tables 2,3 and 4 do not provide an answer to the claim that EVA is a superior metric. Indeed, as the regressions were estimated in Table 6 it may appear that a focus on increasing EVA will result in operating efficiencies which provide higher accounting returns. But, it can also be said, through a simple inversion of the estimated coefficients, that an increase in either of the performance measures can lead to higher EVA. In this context management actions which focus on EVA maximizing principles ought to lead to increased sales and profitability, but in the same light a different paradigm which takes action to maximize sales or operating profits will also lead to a higher EVA. What EVA provides over alternative paradigms is a set of objective rules which sensibly provide a focussed direction to increase profitability. But as a performance metric EVA/Share (or EVA in general) cannot generally be construed as a superior performance metric.

EVA and Stock Market Performance

The real test of EVA is how it relates to stock market performance. In this section EVA/Share is compared to the market performance of the 17 corporation's stock prices (Table 5). Daily returns were calculated for each of the company's stocks and annualized. The mean annual return across the 17 stocks is 30.79% with a cross sectional standard deviation of 41.4%. The mean of the annual standard deviation (risk) in stock prices is 67.9% with standard deviation of 47.4. In contrast, the mean return on the TSE 300 index was only 8.1% with a standard deviation of 11.9%. Only 5 of the companies had returns lower than the market return with a few such as National Sea Products, Van Houtte, and ConPak Foods providing exceptional returns of 87%, 37%, and 168% respectively. However, these marginal returns also came at the expense of

tremendous marginal risks which are in excess of 5 times the TSE annual volatility. The extent of the risk-return relationship is evident by the coefficient of variation (return/risk) which is on average equal to .44 or about 33% less than the market coefficient of variation of 0.68.

In Table 5 we also present an EVA multiple which is similar in interpretation to the P/E multiple used in conventional analysis. The P/(EVA/share) measures the firm's stock price against the EVA/Share. The multiple ranges from a high of 995.48 for ConPak foods to a low of .595 for Lassonde Industries. Five of the companies have negative multiples. These results indicate that the share price-EVA relationship is not at all stable and shows little correspondence with firm value, risk or returns. The two extremes in the positive domain are unrealistic in their representation of value and can only occur if there is substantial and significance mis-pricing in the market relative to EVA. In other words, the results appear to indicate that EVA is not capitalized into share value for this group of firms.

This particular group of agribusiness stocks is not highly correlated with the market portfolio. CAPM β coefficients range from a high of only 0.67 for Maple Leaf Foods and a low of 0.04 for Dover Industries with a mean of only 0.21. In contrast, the market portfolio β is 1.0 and hence in terms of the market model the equilibrium long term returns are lower than the market. These range from a high of 7% for Maple Leaf Foods and a low of 5.1% for Dover Industries.

A consequence of low market correlation is that the systematic risk of each stock is low relative to non systematic risk. For Maple Leaf Foods, systematic risk is only 8% and for Dover Industries it is less than 1% with average systematic risk of 4.4%. There is, however, significant non systematic (Diversifiable) risk. ConPak Seafoods, National Sea Products, and Canadian Agra Foods have nonsystematic risk in excess of 100%, and as a group, the average nonsystematic risk is about 68%.

Table 4: Summary of 1996 EVA Analysis vs Stock Market Returns

Rank	Food Companies	CV	P/EVA	Stock Return (%)	Standard Deviation	CAPM Beta	CAPM ROE	Excess Market Premium	Systematic Risk	Non-Systematic Risk	Premium/ Non-Systematic Risk
1	George Weston Limited	.453	14.23	18.76	41.41	0.563	6.71	12.05	6.74	40.86	0.295
2	Cambra Foods	.383	1.313	16.14	42.19	0.092	5.22	10.92	1.09	42.17	0.259
3	Lassonde Industries	.787	0.595	16.5	20.97	0.085	5.2	11.3	1.01	20.95	0.539
4	Saskatchewan Wheat Pool	.080	16.94	2.17	27.05	0.367	6.09	-3.92	4.4	26.69	-0.147
5	National Sea Products Limited	.560	13.62	87.23	155.75	0.193	5.54	81.69	2.32	155.73	0.525
6	Dover Industries Limited	-0.037	10.68	-0.8	22.11	0.042	5.07	-5.89	0.51	22.1	-0.266
7	XL Foods	.156	42.35	12.27	78.72	0.621	6.89	5.38	7.44	78.37	0.069
8	FPI Limited	.115	71.99	4.85	42.24	0.324	5.96	-1.11	3.88	42.06	-0.026
9	A.L. Van Houtte	.566	91.99	37.12	65.53	0.356	6.06	31.06	4.27	65.4	0.475
10	Maple Leaf Foods	.794	599.19	27.48	34.59	0.672	7.05	20.43	8.05	33.64	0.607
11	Sun-Rype Products	.068	102.82	5.14	75.31	0.144	5.39	-0.242	1.73	75.29	-0.003
12	ConPak Seafoods	.931	995.48	168.48	180.9	0.622	6.9	161.59	7.45	180.75	0.894
13	Sepp's Gourmet Foods	.561	-199.4	29.31	52.28	0.418	6.25	23.06	5.01	0.52	0.443
14	TML Foods	.418	-703.3	53.12	127.04	0.556	6.69	46.43	6.67	126.87	0.366
15	Canadian Agra Foods	-0.113	-506	-13.35	118.23	0.656	7	-20.36	7186?????	117.97	-0.173
16	Fletcher's Fine Foods	1.471	-20.58	44.6	30.33	0.222	5.64	38.96	2.66	30.21	1.29
17	Schneider Corporation	.366	-3.15	14.45	39.42	0.283	5.83	8.62	3.39	39.27	0.219
	TSE 300	.675		18.08	11.98	1	8.08	0	11.98	0	-

Table 5: OLS Regressions of X = a + b x EVA/Share for Financial Performance Metrics

Dependent Variable	Intercept (t-Statistic)	Co-efficient (t-Statistic)	R-Squared
1996 ROA	-0.6336 (-0.00624)	3.457 (1.59)	0.1445
3 Year ROA	-0.0946 (-0.013)	2.479 (1.59)	0.145
1996 ROE	-10.106 (-0.2437)	11.326 (1.29)	0.101
3 Year ROE	-6.362 (-0.272)	8.277 (1.65)	0.154
1996 ROS	-.528 (-0.10)	1.317 (1.16)	0.088
3 Year ROS	-0.342 (-0.083)	1.058 (1.209)	0.0945

The higher returns come at a higher risk. The excess premium for these stocks over the market return ranges from a high of 161% for ConPak Seafoods to a low of -20% for Canadian Agra Foods, with the majority of companies showing an excess return. On average, the excess market return was 24.5% (above the TSE 300 return) but as indicated these returns come at incredible risk. Dividing excess returns by non systematic risk provides a relative coefficient of variation measure. Overall, this measure shows that excess returns are only 31% of available risk; or put another way, for every dollar of marginal, nonsystematic, risk accepted, an investor would only expect a $0.31 return to that risk.

The stock price data is highly variable, but in terms of EVA there are several testable hypotheses which if found to be true would justify a metric. These are:

(1) high EVA/Share firms would realize higher returns and lower risk than low EVA/Share firms, and

(2) high EVA/Share firms would have lower systematic and non systematic risk, and hence require a lower cost of equity capital than low EVA firms.

Table 6 provides the rankings for each of the market measurements and compares them

to the EVA/Share rankings. Unlike, the Table 3 rankings of accounting metrics, there are no discernable patterns which would indicate any reasonable correlation whatsoever. In fact the results are quite anomalous. ConPak Seafood which is ranked number 12 by EVA/Share is ranked #1 according to annual returns and the P/EVA multiple; George Weston Ltd. and Cambra Foods ranked 1 and 2 by EVA/Share are ranked 8th and 11th by the P/EVA multiple, 8th and 10th by annual market returns, 7 and 8th in terms of total risk, 8th and 10th in terms of above-market returns and 9th and 10th in terms of Premium/non-systematic risk.

To determine if any discernable relationship does exist simple regressions were run with EVA/Share being the independent variable. These regressions are found in Table 7. The regression results are consistent with ranking results, and under none of the regressions was a relationship between EVA/Share and stock market performance found. In other words, claims by proponents of EVA that higher EVA leads to higher stock market returns and hence higher share values does not appear to be founded, at least for this group of agribusiness firms.

Discussion and Conclusions

The analytical results provide some support for EVA as a performance metric, but there are no indications that high EVA firms will consistently lead to higher book ROA and ROE and ROS. Rather, all that can really be said is that there is sufficient correlation between EVA/Share and other measures to not exclude it as a viable metric. But as the results show, there is no guarantee that higher EVA gets translated into higher accounting returns.

Table 6: Ranking of EVA/Share to Market Performance

Rank	Food Companies	Annual Return.	Annual Std. Dev.	P/ EVA	CV	Beta	CAPM ROE	Excess Market Premium	Systematic Risk	Non-Systematic Risk	Premium/ Non-Systematic Risk
1	George Weston Limited	8	7	8	8	13	5	8	13	7	9
2	Cambra Foods	10	8	11	10	3	15	10	3	9	10
3	Lassonde Industries	9	1	12	4	2	16	9	2	1	4
4	Saskatchewan Wheat Pool	15	3	7	14	10	8	15	10	3	15
5	National Sea Products Limited	2	16	9	7	5	13	2	5	16	5
6	Dover Industries Limited	16	2	10	16	1	17	16	1	2	17
7	XL Foods	12	13	6	12	14	4	12	14	13	12
8	FPI Limited	14	9	5	13	8	10	14	8	18	14
9	A.L. Van Houtte	5	11	4	5	9	9	5	9	11	6
10	Maple Leaf Foods	7	5	2	3	17	1	7	17	5	3
11	Sun-Rype Products	13	12	3	15	4	14	13	4	12	13
12	ConPak Seafoods	1	17	1	2	15	3	1	15	17	2
13	Sepp's Gourmet Foods	6	10	15	6	11	7	6	11	10	7
14	TML Foods	3	15	17	9	12	6	3	12	15	8
15	Canadian Agra Foods	17	14	16	17	16	2	17	16	14	16
16	Fletcher's Fine Foods	4	4	14	1	6	12	4	6	4	1
17	Schneider Corporation	11	6	13	11	7	11	11	7	6	11

Table 7: OLS Regression of X = a + b EVA/Share for Market Performance Measures

Dependent Variable	Intercept (t statistic)	Co-efficient (t - Statistic)	R-Squared
Annual Returns (%)	.332 (.760)	-0.0485 (-0.519)	0.017
Total Risk	.730 (1.492)	-0.103 (-.0979)	0.06
Share price	19.473 (1.07)	1.433 (.3245)	.007
Coefficient of Variation	.450 (1.084)	-0.011 (-.120)	0.001
Beta	.377 (1.699)	-0.024 (-0.503)	0.017
CAPM Return	.061 (8.739)	-0.0008 (-0.504)	0.017
Non-Systematic Risk	.728 (1.486)	-0.103 (-0.981)	0.06
Excess Market Return	.271 (.622)	-0.048 (-0.513)	0.017
Excess Return to Non-Systematic Risk	.331 (.799)	-0.03 (-0.343)	0.008

It is essential to return to the distinction between EVA as a management tool and EVA as a predictor of stock performance. In the hype about this new management paradigm this distinction is often lost. Proponents of EVA consistently show by example that the share price of EVA implementation companies have led to higher share returns. Presusmably this would occur due to improved asset allocation leading to increased returns in capital employed and ultimately higher share values. This hypotheses could be tested by comparing operating and share performance of EVA implementation firms to that of non EVA firms. This type of EVA is completely different from calculating firm EVA and using it to predict stock prices. As the analysis in this paper has shown there is absolutely no relationship between EVA and stock market performance. It is important to recognize that even though the sample used in this study is relatively small (17), and focussed on a specific sector of the agri food industry, failure to accept

EVA for this group has broad implications for other industries, precisely because EVA is touted as a general paradigm of management which can be applied to all companies to increase shareholder value.

There are several reasons as to why EVA does not cause improved market performance. EVA is based upon book value and asset worth, whereas stock prices are determined by cash flow and growth expectations. Part of the problem may be in the measurement of EVA itself. The Stern-Stewart measure excludes cash flow generated from depreciation tax shields, and cause EVA to be higher than if depreciation was included. The discrepancy with the net present value model is on the cash value of depreciation on an after-tax basis, and hence the measure of EVA does not provide full cash flow information on which the stock market can act. The stock price is very sensitive to growth expectations, and these expectations are based on an extrapolation of book value and fiscal returns. Because of the ambiguity about this growth, the stock market is rather whimsical, and it should not be unexpected that it should fully capture EVA innovations. Furthermore, in reference to the CAPM this particular group of agribusiness stocks revealed a tremendous amount of non systematic risk, and above-market returns. However, these above market returns are speculative in nature, and come with excessive risks. The speculative nature of common stocks would not be consistent with an EVA strategy.

It is difficult, academically to dismiss EVA based on this study's results. Any management tool which leads to the efficient use of operating and term assets, leads to efficient cost of capital and capital structure decisions, and causes management to focus on value, must eventually provide a return to shareholders. It is, however, possible to dispute the usefulness of EVA as a tool for predicting stock performance. Our findings do not show any support for this and this leads to a caveat for both the opponents and proponents of EVA. It should not be expected that EVA generated value will be immediately observed in markets which are volatile in general, and for companies with a high degree of speculative nonsystematic risk in particular. This pernicious market hypothesis is partly supported by our results, but not proven, and is offered as a possible direction towards future research.

EVA has proponents and opponents. This study's aim was to objectively assess the claims of the value of EVA as a stock performance predictor for a small group of Canadian food

companies. It cannot be concluded that EVA provides a superior stock performance metric, or is correlated with increased share values.

It's value as a management tool, whose use in company decision making leads to improved performance remains to be tested. However, EVA's inability to predict the value of stock investments makes its ability to predict value in other investments suspect.