Value Management - Past, Present, and Future
Part 1 – Economic Performance Measurement
To Be Submitted to Shareholder Value Magazine

By Rawley Thomas[1]

Abstract: This series of four articles is controversial because it predicts a dramatic paradigm shift[2] in the way practitioners perform corporate finance and portfolio investment management. Following Geoffrey Moore,[3] innovative value management enthusiasts will quickly see the potential for change from this paradigm shift, while visionary early adopters will require more empirical evidence. Early majority pragmatists will demand systematic solutions to all their needs before considering a shift, but late majority conservatives will wait for adoption by academics and practitioners. In the end, skeptics will never adopt.

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Investors, corporate managers, and consultants should calculate Cash Economic Performance to eliminate the distortions of traditional accounting statements and return measures, apply the discount rates investors use to calculate present values, and employ discounted cash flow (DCF) models of firms based on their empirically observed life cycles. Properly created, these life cycle DCF models provide the benchmark for market expectations. Since this new theory does not confirm that the market is instantaneously efficient, measuring a company's quarterly actual and analysts' estimates against the market expectations from the DCF models promises the portfolio manager an investment *process* likely to outperform the market. In turn, these frameworks help corporate managers understand the mysteries of the stock market and grow their strategic investments where the economic returns (NOT accounting returns) exceed both the investor discount rate and market expectations, thereby producing superior stock returns for their company. To achieve these superior corporate and investment returns requires new, more efficient measurements, databases, and research processes. This series of articles describes the concepts behind the new theory. Later articles portray the empirical research and support, upon which the concepts were based.

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[2] Thomas S. Kuhn, *The Structure of Scientific Revolutions*, Third Edition, The University of Chicago Press, 1996.

[3] Geoffrey A. Moore, *Inside the Tornado: Marketing Strategies from Silicon Valley's Cutting Edge*, Harper Business, 1995, 1999, pp. 14-22.

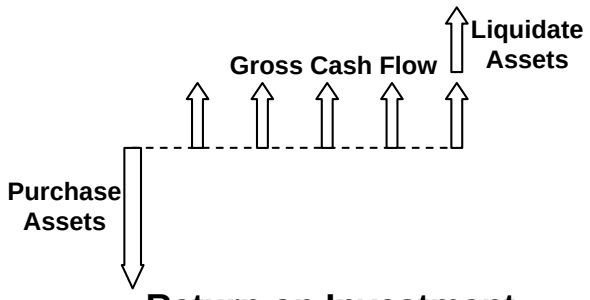
The Concept of Value Management - Introduction

A strong correlation exists between enterprise value and the spread between the Cash Economic Return (CER) and the discount rate investors apply to cash flows. Researchers can build and validate econometric DCF models against historical data to quantify this spread correlation and the key life cycle related operating drivers which most significantly impact value. Managements use these models to analyze their own corporate performance and improve their decision making and value generation. Portfolio managers employ them for buy / sell equity decisions likely to outperform the stock market.

Economic Performance

The first step in Value Management is calculating economic performance. Sophisticated investors can apply the same cash rate of return concepts to both corporate and common stock investments, as illustrated below. For corporate investments, managers calculate the return on investment as the internal rate of return of the cash outflows and cash inflows. For common stock investment, the return on investment is the geometric mean of the annual returns, assuming dividends are reinvested at the then price.

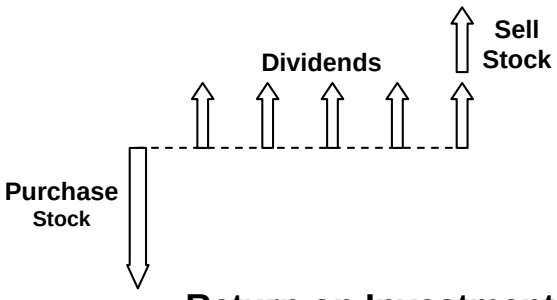
Corporate Investment



Return on Investment

Internal Rate of Return of Cash-Out and Cash-In Flows

Common Stock Investment

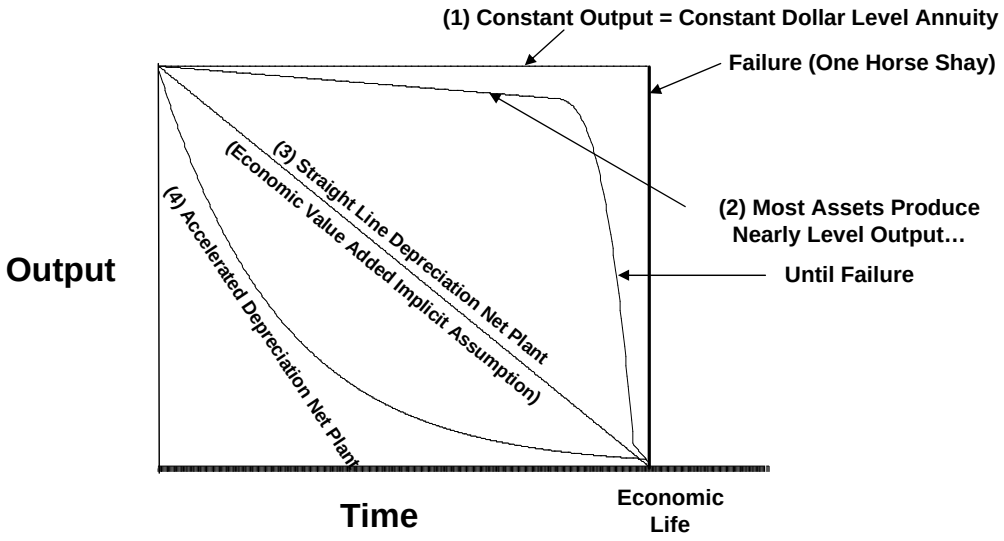


Return on Investment

Geometric Mean of Annual Returns Assuming Dividends Reinvested at the then Price.

Investors can more easily apply these rates of return concepts because most assets produce a nearly level useful output until failure, instead of the straight line or the declining balance accelerated curve reflecting depreciated net plant. (See diagram below.) For example, if a person's car achieved 25 mpg the first year, 20 the second, 15 the third, 10 the fourth, and 5 the fifth, or if the transmission worked perfectly the first year but only 20% of the time by the fifth year, then one would likely seek another car manufacturer who produced reliable vehicles until the end of their useful economic life.[4] The consumer expects some modest increase in maintenance expenses, but most assets produce high output levels throughout their lives. In fact, well-designed assets incorporate systems which are designed to fail simultaneously, so one is not costly over designed relative to the others. If one major system fails, it is logical to say, "Now is the time to trade the car to avoid the other major systems failing."

MOST ASSETS PRODUCE A NEARLY LEVEL USEFUL OUTPUT UNTIL FAILURE, INSTEAD OF THE STRAIGHT LINE OR THE DECLINING BALANCE CURVE REFLECTING DEPRECIATED PLANT



The diagram above displays four output curves to illustrate the principles just discussed. The top line shows constant output or a constant dollar level annuity until the asset reaches its economic life, when failure causes that output to fall immediately to zero, as in the classic one horse shay example. The second line down from the top displays the high output for most assets until failure at their economic life. The third line, a diagonal from the upper left to the lower right, exhibits the net plant under straight line depreciation. Economic value added models implicitly assume this line of output, unless they adjust each asset's depreciation schedule from the one reported. The fourth line, curved from the upper left to the lower right, reveals the net plant under declining balance accelerated depreciation. Of course, not all assets produce constant output, equivalent to a constant dollar level annuity; however their output line (2) more closely

[4] See Oliver Wendell Holmes' poem, "The Deacon's Masterpiece or, the Wonderful 'One-Hoss Shay': A Logical Story." The one Hoss Shay was designed to last precisely one hundred years to the day, on which day it fell apart to dust.

resembles that line (1) than the depreciated net plant line (3). Therefore, the constant output assumption is closer to reality than the depreciated net plant output assumption.

Little has been written on output curves, although a rich literature on optimum asset replacement policy exists.[5] Substantially complicating the analysis is competitive reaction. Most new assets produce higher output and have less down time than older assets. Some face declining prices. The relevant issue is how much of the higher output, less down time, and lower prices flow through to investors and how much flows through to customers in the form of lower prices and margins from competitive pressures.

For example, consider the output curves of computers. Consistent with the previous example, the output produced by the PC remains constant as it ages. Despite increased capacity and speed with lower prices, no one purchases a new computer each month. Even computers have a design life, reflecting the amortization of their costs with benefits given the usage application and over which output is reasonably stable. Some purchase new computers every 12-18 months, if speed and capacity are critical. The rest make do with replacements every 3-5 years.

For the future, more research on asset output, lives, and competitive price reaction will likely occur, as the importance of this field and data becomes more obvious and relevant to economic performance measurement. Of particular importance will be applying these principles to capitalizing expenses associated with creating intellectual intangible property – software, customer acquisition, employee training, advertising, and R&D – all most important to the proper economic performance measurement in service industries. *All* businesses follow this fundamental cash-out, cash-in project pattern with a finite life of the depreciating or amortizable assets. The challenge is identifying the fundamental underlying projects and properly accounting for them so measuring cash economic returns becomes possible. As business continues the shift from "hard" assets to intangible assets in a more service oriented economy, the more important solutions to these measurement issues will become.

Accounting Versus Economic Rate of Return Measures

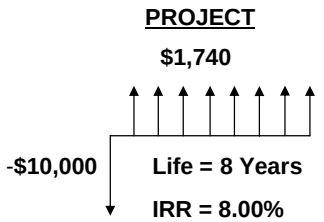
Accounting academics have known for many years that annual accounting rates of return – return on equity (ROE), return on net assets (RONA), return on capital employed (ROCE), and return on assets (ROA) – do not reflect the economic or internal rate of return of the underlying projects. Ezra Solomon, Gerald Salamon, and Richard Brief wrote some of the classic articles on the problem of relating economic to accounting returns.[6] The difference between the accounting returns and economic returns relates to the pattern of cash flows within the project, the depreciation method, the growth rate of the projects, the project life, and inflation, making the problem just about insolvable. But, if one can make the simplifying assumption that most assets

[5] A classic is George Terborgh's *Business Investment Policy: A MAPI Study and Manual*, Machinery and Allied Products Institute and Council for Technological Investment, Washington, DC, 1958.

[6] See Richard P. Brief, ed., *Estimating the Economic Rate of Return from Accounting Data*, Garland, New York, 1986. See also, Richard P. Brief and Raef A. Lawson, "Approximate Error in Using Accounting Rates of Return to Estimate Economic Returns," *Journal of Business Finance & Accounting*, January, 1991, pp. 13-20 and "…A Correction," November 1991, pp. 915-916.

produce constant output and follow a constant dollar level annuity, one can create an annual performance measure – gross cash flow return on gross assets with a finite life – which precisely equals the economic or internal rate of return of all the underlying projects. Then one only need apply Ijiri's[7] insight on the proper method for accounting for inflation – simply to translate all cash flows from the income statement and balance sheet into units of the same constant dollar purchasing power. This appropriate treatment relates to investors' objectives to receive a return for their investment, all expressed in the same purchasing units. The type of assets or their replacement cost matters little to investor rate of return objectives.

To illustrate these principles, consider a project consisting of a depreciating asset costing $10,000 which produces cash flows of $1,740 for eight years with no salvage value. This project produces an internal rate of return (IRR) of 8.00%. Assume for the moment no inflation. The table below displays the project and the accounting for each year. The income is constant, but the net plant declines from $8,750 in year 1 to zero in year 8. The return on net assets (RONA = net income / net plant) begins at 5.6% in year 1, rises to 39.2% in year 7, and becomes infinite in year 8. Only in year 3 does the RONA approximately equal the 8% IRR economic rate of return, known for the project.



NOTE: The Annual CER each and every year precisely equals the IRR of the project.

Annual Performance Measures of Project

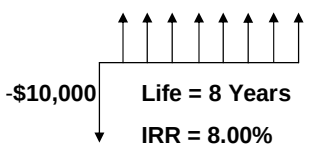
	Year 1	2	3	4	5	6	7	8
Income	490	490	490	490	490	490	490	490
Depreciation	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250
Gross Cash Flow	1740	1740	1740	1740	1740	1740	1740	1740
Gross Plant	10000	10000	10000	10000	10000	10000	10000	10000
Accumulated Depreciation	1250	2500	3750	5000	6250	7500	8750	10000
Net Plant	8750	7500	6250	5000	3750	2500	1250	0
Return on Net Assets = RONA = Income/Net Plant	5.60%	6.53%	7.84%	9.80%	13.07%	19.60%	39.20%	8
Cash Economic Return (CER)	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%
Difference	-2.40%	-1.47%	-0.16%	1.80%	5.07%	11.60%	31.20%	8
Return on Gross Assets	17.40%	17.40%	17.40%	17.40%	17.40%	17.40%	17.40%	17.40%

With inflation, the RONA bias becomes worse, as cash flows tend to rise with the price level, while the historical dollar net plant declines with depreciation accounting.

The annual performance measure, the Cash Economic Return, explained in detail in the Appendix, precisely equals the 8% economic return each and every year, because it relates the gross cash flow to the gross assets over the 8 year life as an IRR calculation. Another simplified annual performance measure, return on gross assets (ROGA = gross cash flow / gross plant) remains constant at 17.4% and avoids the upward bias of RONA.

[7] Yuji Ijiri, "Recovery Rate and Cash Flow Accounting," Financial Executive, March 1980, pp. 54-60.

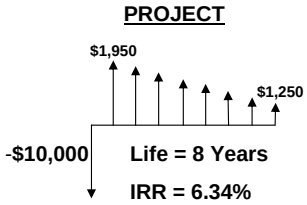
Any accounting measure, like EVA®[8], which relies on an accounting return of net income / net assets after depreciation, suffers from the same biases. See the table below.



	Annual Performance Measures of Project							
	Year							
	1	2	3	4	5	6	7	8
Net Plant	8,750	7,500	6,250	5,000	3,750	2,500	1,250	0
Assume Cost of Capital = 8%								
Capital Charge	(700)	(600)	(500)	(400)	(300)	(200)	(100)	0
Income	490	490	490	490	490	490	490	490
Economic Value Added (EVA®)	(210)	(110)	(10)	90	190	290	390	490
CER	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%
Cost of Capital	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%
Spread	0	0	0	0	0	0	0	0
Gross Plant	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
Cash Value Added	0	0	0	0	0	0	0	0

Since the rate of return = cost of capital, the cash value added should be zero each year, not negative in the early years and positive in the later years.

Only where output declines with depreciated net plant, does the annual RONA approximate the project IRR. [9]



		Annual Performance Measures of Project							
		Year							
		1	2	3	4	5	6	7	8
Net Plant		8,750	7,500	6,250	5,000	3,750	2,500	1,250	0
Assume Constant RONA =	8%								
Income		700	600	500	400	300	200	100	0
Depreciation		1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250
Gross Cash Flow		1,950	1,850	1,750	1,650	1,550	1,450	1,350	1,250
				IRR on Cash Flows:			6.34		

[8] EVA® is a registered trademark of Stern Stewart Company.

[9] Using beginning-of-year assets eliminates this RONA/IRR difference.

Representing Stern Stewart's point of view, Harold Bierman[10] of Cornell, would correct the RONA / project IRR difference by applying present value or economic depreciation. It is true that one may calculate a rate of annual economic depreciation each year which sets the annual RONA equal to the project IRR, *if* one knows with certainty both the cash flow pattern of the project and the future level of inflation.[11] But most do not have that inside knowledge, and even insiders would find gathering that data most challenging.[12] It is much more practical to make the simplifying assumption that most assets produce a constant dollar level annuity more closely than a linearly declining output pattern consistent with straight line depreciation.

Others may say new projects counterbalance old projects, so RONA's average out. While true directionally, this hypothesis is not supported by client work or empirical work with company financial statements. In the late 1980's, the writer recollects that McKinsey asked HOLT to quantify how frequently the accounting returns provided the wrong strategic direction for the company compared to the economic returns. 30% was the answer. 30% of the time, accounting RONA's exceeded their cost of capital hurdle while the economic returns fell below the real investor's required returns or vice-versa.

Examples of the failure to address the material differences between accounting returns and Cash Economic Returns abound in academic research studies. For instance, at the Financial Management Association International 2002 annual conference in San Antonio, the author recalls that Kenneth French displayed level to declining Return on Assets, ROA's, during the 1990's. Actually, economic returns increased significantly during the 1990's because of declining inflation and more non-cash charges for amortization of goodwill. The increase helps to explain superior stock price performance; the nominal accounting returns do not. Most academic researchers should pay much closer attention to the material differences between Cash Economic Returns and accounting returns. Insights on market performance arise from understanding these differences in depth; however these insights are not available from calculating simple accounting returns.[13]

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[10] Harold Bierman, "Beyond Cash Flow ROI," *Journal of Applied Corporate Finance*, pp. 36-39.

[11] Brief, op. cit., pp. 5-6 Introduction, "Anthony's 1986 note, which is the latest paper written on the subject, claims that 'a substantial part of the difference between the measurement of profitability by accountants and economists can be eliminated by making two changes in accounting principles': (1) require companies to use annuity (economic) depreciation, and (2) recognize the cost of equity capital in financial reports.
This latest proposal does not, of course, solve the problem, because it assumes a situation in which all the relevant cash flows are known. As Zeff pointed out in his discussion of Solomon's 1966 paper, economic depreciation is a 'weak reed for the very reason the problem exists: uncertainty.'"

[12] Some assets, like selected oil wells, may have steeply declining output curves. This is the only situation where linking annual performance to the project IRR requires annual RONA measures based on economic depreciation.

[13] To alleviate the significant challenges of calculating Cash Economic Returns, LifeCycle Returns makes these numbers available for academic research studies at no charge.

The empirical evidence on the subject is clear. Cash Economic Returns or CFROI®'s[14] exhibit 50% more explanatory power than ROE's.

	R^2
Price/Book versus ROE Spread	0.39
Value/Cost versus CFROI® Spread	0.65

Conclusion

Why should corporate managers and portfolio investment professionals care about economic performance measurement? Because improved measures lead to greater insights, resulting in superior decisions for both corporate managers and portfolio investment professionals.

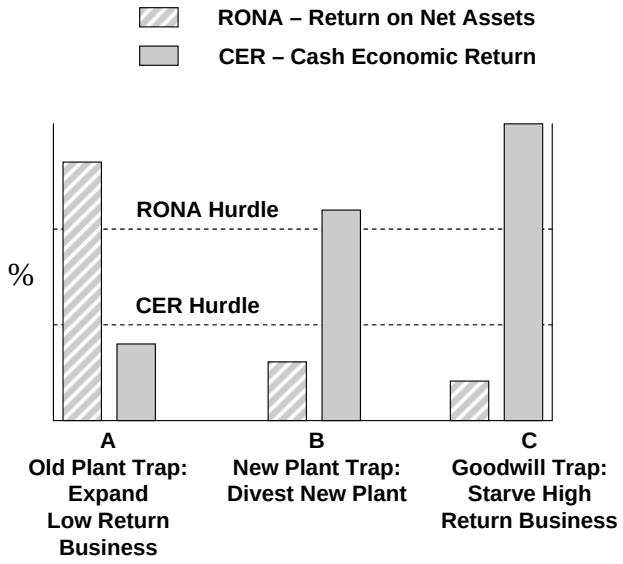
[14] CFROI® is a registered trademark of CSFB HOLT Value Associates. Source: See **http:\\ HOLTValue.com.**

The following paragraphs describe corporate planning applications. Referring to Case B in the diagram below, ponder the chemical company, under investor pressure, which sold its new plants because they showed the lowest returns on net assets, while retaining the older, inefficient plants with higher RONA's. Or consider the tire company, Case A, whose strategic plan showed increasing RONA's barely reaching the cost of capital as they let their plants age, while the economic returns remained substantially below water. They were acquired in an unfriendly takeover by a management group who realized complacency was not an option. Dramatic restructuring would be required.

Examine Case C in the diagram below, where the credit operation was acquired for its very high returns, and then starved by the Board of Directors, because its low RONA's including goodwill were not making the cost of capital,. Accounting for goodwill in performance measurement is a controversial subject. Many include goodwill in the asset base, as the above company did, in order to penalize the unit for the price paid. In contrast, the new theory would treat goodwill as a valuation item, not a performance one. It would exclude goodwill from the gross cash investment base to calculate the economic returns *on the operations*, so the acquiror could feed it more sensible market extension investment to justify the purchase price paid. Then the firm would value the business, demanding the increase in value exceed the purchase price paid plus new investment. The new theory would not let low RONA's including goodwill discourage new investment.

The diagram below illustrates how accounting measures encourage poor decisions, because the nominal RONA suggests one strategy, while the economic return suggests precisely the opposite.

ACCOUNTING RETURN MEASURES ENCOURAGE POOR DECISIONS



The previous discussion and chart covered corporate planning applications. Following are some portfolio investment examples in narrative form. Consider the mature paper company with rising EPS. Traditional approaches would treat this firm as a buy candidate. But the company was investing faster in assets than the rise in EPS – its cash economic return was falling. It should be sold.

Review the low P/E timber firm which appears to be a bargain purchase. However, if the cash economic return is less than the cost of capital and management is growing the assets, it should be sold. Management doesn't understand basic economics.

Lastly, reflect on the aerospace company with level EPS, whose stock investors normally avoid. Nevertheless, if the management is restructuring the asset base by eliminating unprofitable operations and the cash economic return is rising, the company should be a buy candidate.

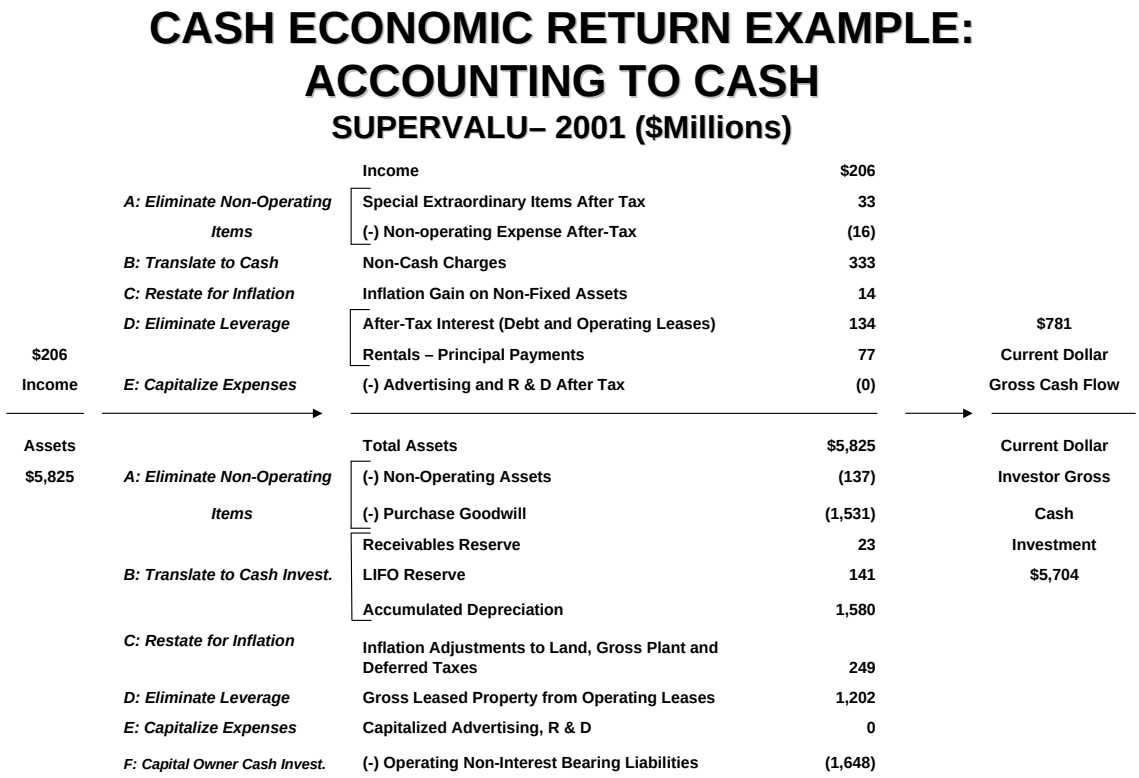
The next three articles will discuss valuation, cost of capital, risk, and additional applications. Throughout, these writings will try to predict paradigm shifts in the way practitioners perform corporate finance and investments and how their decisions will change with the new frameworks.

Appendix – The Calculation of the Cash Economic Return

The figure below displays the details of the Cash Economic Return for SuperValu in 2001.[15] The method transforms the $206 income and $5,825 assets into $781 of gross cash flow and $5,704 of gross cash investment, all expressed in the same units of investor purchasing power – 2001 current dollars.

- ***A***: To income, LifeCycle Returns (LCRT) adds $33 in extraordinary items after tax and subtracts $16 in non-operating expenses. To assets, LCRT subtracts $137 of non-operating assets and $1,531 of purchase goodwill. These two adjustments focus the results on the operations.

- ***B***: Non-cash charges of $333 in the numerator consist of depreciation, amortization, and changes to the allowance for doubtful accounts. In turn, adding back reserves for receivables, LIFO (inventory), and accumulated depreciation – $23, $141, and $1,580 respectively, returns to the original investor cash investment in the denominator assets.



[15] Source: Raw data from Standard & Poor's Compustat; Inflation adjustments from LifeCycle Returns, Inc.

- ***C***: To reflect inflation and restate all historical dollars to 2001 dollars, LCRT computes a $14 gain on non-fixed assets in the numerator (GDP deflator change X non-fixed assets – payables and other non-debt liabilities for SuperValu exceed assets of receivables, operating cash, inventories, and other assets) and a $249 adjustment to land, gross plant, and deferred taxes to the denominator. Using the plant life and age enables approximate restatement of historical cost for plant to 2001 dollars without knowing internal company records.[16] When tested against internal company records from selected clients, the algorithm is accurate within 5-10%, unless capital expenditures have been extremely large in the last 1-2 years.

CASH ECONOMIC RETURN EXAMPLE: ACCOUNTING TO CASH

SUPERVALU– 2001 ($Millions)

		Income	$206	
	A: Eliminate Non-Operating	Special Extraordinary Items After Tax	33	
	Items	(-) Non-operating Expense After-Tax	(16)	
	B: Translate to Cash	Non-Cash Charges	333	
	C: Restate for Inflation	Inflation Gain on Non-Fixed Assets	14	
	D: Eliminate Leverage	After-Tax Interest (Debt and Operating Leases)	134	$781
$206		Rentals – Principal Payments	77	Current Dollar
Income	*E: Capitalize Expenses*	(-) Advertising and R & D After Tax	(0)	Gross Cash Flow
Assets		Total Assets	$5,825	Current Dollar
$5,825	*A: Eliminate Non-Operating*	(-) Non-Operating Assets	(137)	Investor Gross
	Items	(-) Purchase Goodwill	(1,531)	Cash
		Receivables Reserve	23	Investment
	B: Translate to Cash Invest.	LIFO Reserve	141	$5,704
		Accumulated Depreciation	1,580	
	C: Restate for Inflation	Inflation Adjustments to Land, Gross Plant and Deferred Taxes	249	
	D: Eliminate Leverage	Gross Leased Property from Operating Leases	1,202	
	E: Capitalize Expenses	Capitalized Advertising, R & D	0	
	F: Capital Owner Cash Invest.	(-) Operating Non-Interest Bearing Liabilities	(1,648)	

[16] Lewis, Thomas G., Daniel M. Stelter, Thomas Casata, Monika Reiter, *Steigerung des Unternehamenswertes (Total Value Management),* Verlag Moderne Industrie, 1994, pp. 244-247.

Madden, Bartley J., *Cash Flow Return on Investment (CFROI) Valuation: A Total System Approach to Valuing the Firm*, Butterworth Heinemann, Oxford, 1999, pp. 114-118, 253-254.

- ***D***: Capitalizing $1,202 of operating leases in the denominator and adding back $134 of after-tax interest on debt and leases along with the $77 principal portion of rental payments to the numerator makes the measure independent of financial leverage.

- ***E***: If SuperValu disclosed advertising and R&D, those elements would be capitalized in the denominator, while adding back the after-corporate-tax effect in the numerator.

- ***F***: Lastly, LCRT subtracts $1,648 of non-interest bearing liabilities, in order to effectively reconcile to the cash investment made by all the equity holders, debt holders, and landlords.

CASH ECONOMIC RETURN EXAMPLE: ACCOUNTING TO CASH

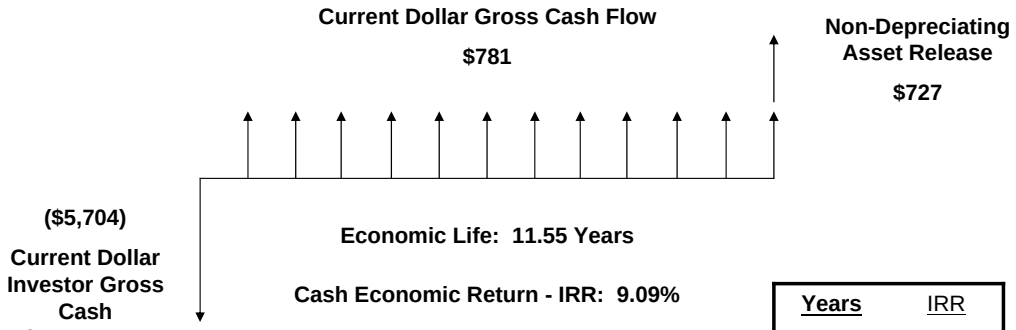
SUPERVALU– 2001 ($Millions)

		Income	**$206**	
	A: Eliminate Non-Operating Items	**Special Extraordinary Items After Tax**	**33**	
		(-) Non-operating Expense After-Tax	**(16)**	
	B: Translate to Cash	**Non-Cash Charges**	**333**	
	C: Restate for Inflation	**Inflation Gain on Non-Fixed Assets**	**14**	
	D: Eliminate Leverage	**After-Tax Interest (Debt and Operating Leases)**	**134**	**$781**
$206		**Rentals – Principal Payments**	**77**	**Current Dollar**
Income	***E: Capitalize Expenses***	**(-) Advertising and R & D After Tax**	**(0)**	**Gross Cash Flow**
Assets		**Total Assets**	**$5,825**	**Current Dollar**
$5,825	***A: Eliminate Non-Operating Items***	**(-) Non-Operating Assets**	**(137)**	**Investor Gross Cash Investment**
		(-) Purchase Goodwill	**(1,531)**	
		Receivables Reserve	**23**	
	B: Translate to Cash Invest.	**LIFO Reserve**	**141**	**$5,704**
		Accumulated Depreciation	**1,580**	
	C: Restate for Inflation	**Inflation Adjustments to Land, Gross Plant and Deferred Taxes**	**249**	
	D: Eliminate Leverage	**Gross Leased Property from Operating Leases**	**1,202**	
	E: Capitalize Expenses	**Capitalized Advertising, R & D**	**0**	
	F: Capital Owner Cash Invest.	**(-) Operating Non-Interest Bearing Liabilities**	**(1,648)**	

The ratio of $781 gross cash flow to $5,704 is not yet a proper return measure, because it erroneously assumes the assets last forever. To reflect the finite life of depreciating assets, LCRT transforms the Cash Economic Return into a project, 9.09% internal rate of return (IRR) format, according to the diagram below. The $5,704 down arrow reflects the current dollar investor gross cash investment expressed in 2001 dollars. The 11.55 ~ 12 up arrows of $781 reflect the current dollar annual gross cash flow available to all the investors and to the business for reinvestment. Life equals a weighted average of the operating leased asset life of 15 years and the plant life from gross plant / depreciation. Of all the estimates, plant life merits the greatest scrutiny in client assignments to assure it reflects the economic life over which the assets produce cash flows until failure and to ensure the proper fixed asset inflation adjustment.

CASH ECONOMIC RETURN EXAMPLE: CASH TO ECONOMICS

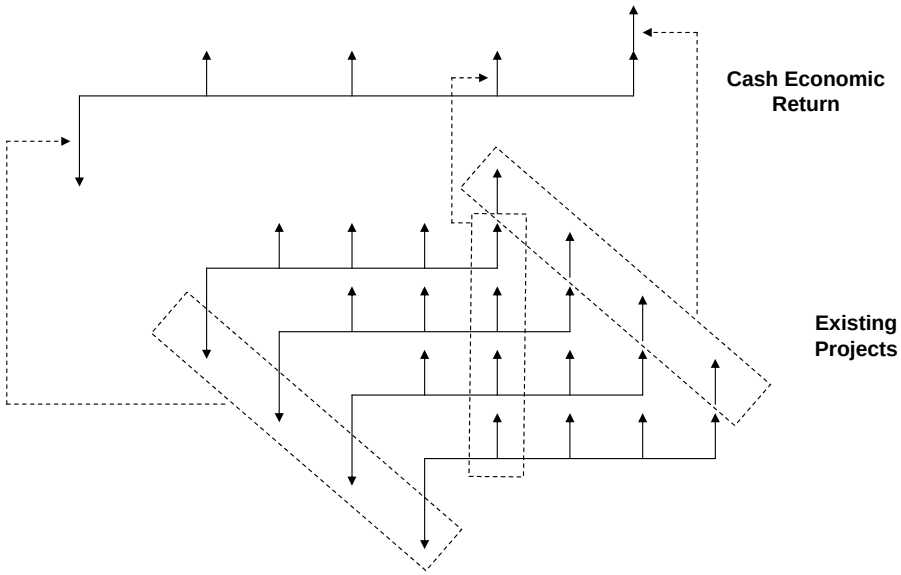
SUPERVALU– 2001 ($ MILLIONS)



Years	IRR
11	8.62
12	9.48
11.55	9.09

The diagram below displays how the Cash Economic Return, CER, reflects the average internal rate of return (IRR) of all the projects in place. The sum of the down arrows of each of the four existing projects produces the gross investment down arrow in the CER. Likewise the project gross cash flows sum to the CER gross cash flow and the project non-depreciating asset releases sum to the CER non-depreciating asset release. With the one assumption that most projects and assets produce nearly constant dollar level annuities for their economic life, the proof follows that the CER equals the IRR of all the projects in place, *irrespective of the growth rate of investment into the projects or a variable inflation rate*.

CASH ECONOMIC RETURN REFLECTS THE AVERAGE INTERNAL RATE OF RETURN OF ALL THE PROJECTS IN PLACE



A giant spreadsheet created by the writer in the late 1980's quantified how much error between the project IRR's and the CER is created with changing real growth rates and deviations in the cash flow patterns from the constant dollar level annuity assumption. The conclusion from that work is that very significant deviations and growth rates are required in order to produce large errors between the CER and the underlying project's IRR's.

The capability to relate annual performance measures derived from accounting data to capital budgeting project internal rates of return represents an extremely powerful way of monitoring firm economic performance. This capability enables comparison of economic performance across firms through time, without the cash distortions arising from accounting conventions, depreciation, purchase goodwill, or varying inflation. Is it perfect? – No. Is it much better than other performance measures – accounting returns, E.P.S. growth? – Yes. The CER represents a practical method for translating accounting information to economic real internal rates of return with *imperfect, noisy* data. Any academic taking issue with the constant dollar level annuity assumption bears the responsibility, if not the obligation, to propose a better, *practical* alternative applicable to real world company data, which is equally correct theoretically.

Value Management - Past, Present, and Future
Part 2 – Valuation Frameworks
To Be Submitted to Shareholder Value Magazine

By Rawley Thomas[17]

Abstract: This series of four articles is controversial because it predicts a dramatic paradigm shift[18] in the way practitioners perform corporate finance and portfolio investment management. Following Geoffrey Moore,[19] innovative value management enthusiasts will quickly see the potential for change from this paradigm shift, while visionary early adopters will require more empirical evidence. Early majority pragmatists will demand systematic solutions to all their needs before considering a shift, but late majority conservatives will wait for adoption by academics and practitioners. In the end, skeptics will never adopt.

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Investors, corporate managers, and consultants should calculate Cash Economic Performance to eliminate the distortions of traditional accounting statements and return measures, apply the discount rates investors use to calculate present values, and employ discounted cash flow (DCF) models of firms based on their empirically observed life cycles. Properly created, these life cycle DCF models provide the benchmark for market expectations. Since this new theory does not confirm that the market is instantaneously efficient, measuring a company's quarterly actual and analysts' estimates against the market expectations from the DCF models promises the portfolio manager an investment *process* likely to outperform the market. In turn, these frameworks help corporate managers understand the mysteries of the stock market and grow their strategic investments where the economic returns (NOT accounting returns) exceed both the investor discount rate and market expectations, thereby producing superior stock returns for their company. To achieve these superior corporate and investment returns requires new, more efficient measurements, databases, and research processes. This series of articles describes the concepts behind the new theory. Later articles portray the empirical research and support, upon which the concepts were based.

The previous article discussed the usefulness of economic returns as annual company performance measures. It demonstrated how cash economic returns eliminate the distortions between annual return on assets measures and the underlying project internal rates of return. These improved measures lead to greater insights, resulting in superior decisions for both corporate executives and equity portfolio investment managers. This article covers how a valuation framework based on the life cycles of firms provide the benchmark for investor market expectations.

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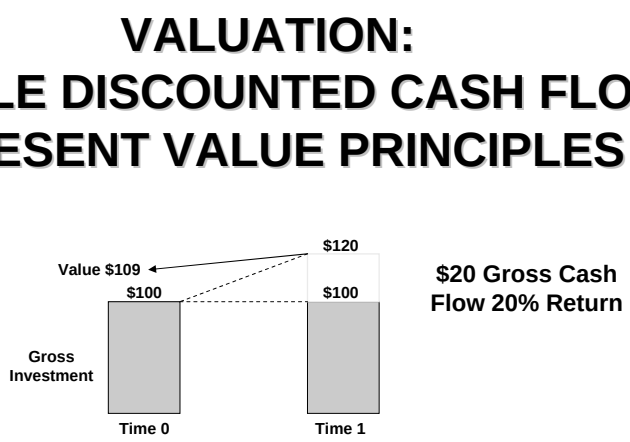
[17] Rawley Thomas is President of LifeCycle Returns, Inc. (LCRT) in St. Charles, Illinois. He served as Assistant Treasurer of SuperValu Stores, joined Callard, Madden in 1981, co-founded HOLT Planning in 1985, and directed Value Management research for The Boston Consulting Group for eleven years. Credit Suisse First Boston acquired the successor to HOLT Planning, HOLT Value, in early 2002. Thomas has served as Practitioner Director for the Financial Management Association International. Currently, he serves on the DePaul Finance Advisory Board and the Northern Illinois Accountancy Board. He can be reached at Rawley@LCRT.com

[18] Thomas S. Kuhn, *The Structure of Scientific Revolutions*, Third Edition, The University of Chicago Press, 1996.

[19] Geoffrey A. Moore, *Inside the Tornado: Marketing Strategies from Silicon Valley's Cutting Edge*, Harper Business, 1995, 1999, pp. 14-22.

Valuation

Most all readers of this magazine understand present value principles. All valuation frameworks start from these fundamental principles. Consider the project illustrated in the diagram below:



Since the corporate rate of return of 20% exceeds the investor's discount rate of 10%, the price of $109 exceeds the $100 cost of the Gross Investment.

An investment of $100 produces $120 in one year - $100 return of the original investment plus $20 excess return. The project produces a 20% rate of return on investment.

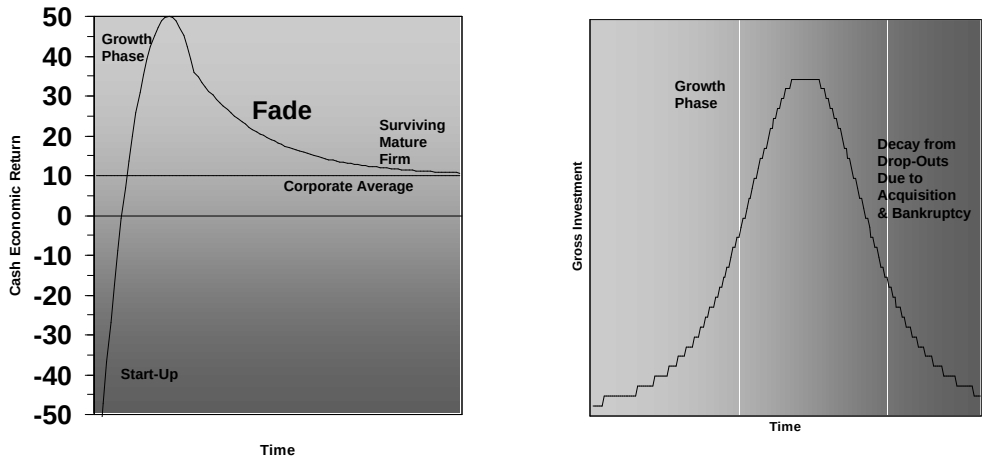
Assume investors demand 10% for the use of their capital. The investors will value the $120 return at a price of $109 = $120 / 1.10. Since the corporate rate of return of 20% exceeds the investor's discount rate of 10%, the price of $109 exceeds the $100 cost of the gross investment.

Two paradigm shifting insights arise from this very simple example and the application of LCRT's theory: 1) describing the $20 future cash flow with the 20% *rate* of return measure and 2) comparing the 20% directly to the 10% investors' discount rate. These insights are very important, because forecasting dollar amounts of cash flows can be quite challenging, while forecasting *rates* of return can be much easier. Investors compete for investment *rates* of return, not dollar returns. Without knowing the investment base, it's impossible to evaluate the attractiveness of a dollar return figure. A $100,000 return may appear attractive until the fact arises that it requires a $10 million investment – a 1% rate of return is very low. Finally, since the 20% is a *rate* of return measure, it compares directly in the same units to the 10% *rate* of investor discount – a primary focus of investors.

Life Cycle and Fade

The diagram below portrays the life cycle of the average surviving firm – its Cash Economic Return and its investor gross cash investment. A start-up firm begins with a chest of cash from its initial public offering (IPO). It "burns" the cash to create new products or services. Its Cash Economic Return, CER, is steeply negative during its start-up phase,[20] which explains why many, if not most, firms fail during this start-up phase. The successful few surviving start-up firms shoot their CER performance through all the averages, becoming some of the most profitable firms in the market. Investors purchase portfolios of these start-up firms, so the few "gushers" will offset all the other losses. As the firm matures, it fades toward the corporate average.

THE LIFE CYCLE OF THE AVERAGE FIRM



Investors price for these expectations in Firms' life cycles and associated cash flows.

Traditional valuation estimates cash flows for a number of years and then projects a terminal value, often with perpetuity. This paradigm shifting[21] new LCRT theory employs the CER's, even for start-ups, as the economic performance measure, and gross investment life cycle patterns from which to estimate the cash flows. It recognizes that fade and drop-outs occur with real firms.

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[20] Two versions of the CER exist: an IRR version and a ratio version. The IRR version uses an internal rate of return format, with a gross cash outflow, a set of gross cash inflows over a finite life, and a non-depreciating asset release residual to calculate the annual economic rate of return. The ratio version subtracts a sinking fund depreciation amount from the gross cash flow before dividing by the gross investment. The IRR version fails to calculate with negative gross cash flows, so it fails to produce an economic performance measure just when one is most needed: when the firm first starts and when it heads toward bankruptcy. The ratio version avoids this pitfall, but parallels the IRR version for the range of most companies' performances. The ratio version transforms the return on gross investment into an economic return measure reflecting the finite life of the depreciating assets.
Researchers should always be most concerned about any measure which does not calculate at the boundaries of performance, because that measure is not robust. Another relevant example is EPS growth rates: they don't calculate meaningfully when EPS in the base period is negative.

[21] Thomas S. Kuhn, *The Structure of Scientific Revolutions,* Third Edition, The University of Chicago Press, 1996.

How is this new theory a paradigm shift? Most valuations estimate line items of the income statement and balance sheet from a ratio analysis to sales for several years. Then those valuations employ a perpetuity of the last year's cash flow to complete the process. Compound optimism often makes the forecasted yearly cash flows unrealistic when benchmarked against their implied economic returns. Since 50% of firms disappear within 20 years, the data simply do not support the realism of the perpetuity assumption. The new theory focuses on rates of return and investments instead of line items, while eliminating the unrealistic perpetuity assumption.

The history of valuation models which led us to this point is well known. The changes necessary to continue the paradigm shifting process into the future are readily projected. Miller & Modigliani (M&M) wrote a classic article on valuation, dividing the present values into those cash flows from existing assets and those from future investments.[22] Meanwhile, Williams, Gordon, and Shapiro[23] developed the dividend discount model, capitalizing dividends by the required investor return less the growth rate in dividends. Analysts used the Gordon growth model both as a valuation model, given a cost of capital, and as a method for estimating the investor's required rate of return on equity or equity discount rate.[24] To solve the problem of zero dividends for youthful firms with superior returns, Fuller and others developed the three phase dividend discount model.[25]

The writer recalls that Bart Madden[26] applied this three phase approach to the valuation model as early as 1981, employing a seven year hold period and a twenty-seven year linear fade period to the average return level for the cash flows from future investments from the M&M model. After co-founding HOLT with Bob Hendricks, Eric Olsen, and Marvin Lipson in 1985, the author applied an exponential fade[27] to both the existing assets and the future investments to double the accuracy of the valuations for very high and very low CFROI®[28] companies. By this time, Lipson developed the deviation statistic to measure the percent error from the high / low price. HOLT then possessed a measurement methodology for the accuracy of a valuation model. In the late 1980's, Bob Litzenberger of Wharton suggested measuring the actual fade patterns of companies. Also in the late 1980's Manfred Michelmayer of Unocal suggested a new model called time fade to replace the Miller / Modigiliani type project fade model. The project model

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[22]Merton H. Miller and Franco Modigliani, "Dividend Policy, Growth, and the Valuation of Shares," *The Journal of Business*, October 1961, pp. 411-433.

[23] J.B. Williams, *The Theory of Investment Value*, Harvard University Press, Cambridge, MA, 1938, and M.J. Gordon and E. Shapiro, "Capital Investment Analysis: The Required Rate of Profit," Management Science, October 1956, pp. 102-110.

[24] See, for example, Ibbotson Associates, *Cost of Capital Quarterly.*

[25] Russell J. Fuller, "Programming the Three-Phase Dividend Discount Model," *Journal of Portfolio Management,* Summer 1979, pp. 28-32. See also Michael S. Rozeff, "The Three-Phase Dividend Discount Model and the ROPE Model," *Journal of Portfolio Management*, 1990, pp. 36-42.

[26] Bart Madden carries out research investigating the link between corporate performance and market valuation at CSFB HOLT. Author *of Cash Flow Return on Investment Valuation: A Total System Approach to Valuing the Firm*, Butterworth Heinemann, Boston, 1999.

[27] For academic evidence on fading profits, see Dennis C. Mueller, *The Dynamics of Company Profits*, Cambridge University Press, Cambridge, 1990. Note this book was published five years after HOLT's adoption of the exponential fade methodology.

[28] CFROI is a registered trademark of CSFB HOLT.

faded the cash flows of the projects within the existing assets separately from those in future investments, while time model faded across *all* projects and was more consistent with the actual CFROI® measurements. The magnitudes of valuation, however, did not significantly differ between the two models.

The author recalls that Joel Stern offered an EVA® model forecasted to achieve excess returns for "T" years, after which the return fell to the cost of capital, so no incremental value was created. The strength of the model was focusing on rate of return spreads over the cost of capital, while its weakness related to its failure to reflect the average real internal rates of return on the assets of the underlying projects, as previously discussed in the first article.

Al Rappaport, the founder of ALCAR, described a framework for estimating future cash flows largely based on margins, capital turns, and other variables.[29] Rappaport was one of many who suggested models might be used to back into the market implied performance measures by using the current price to derive the model drivers – in his case margins and turns.[30] Line items of margins and capital turns suffer from their failure to focus on company *rates* or return relevant to investors.

Except for the dividend discount model, James Ohlson appears to be the focal point for academic research in this area of DCF valuation models.[31] He concentrates on analysts' forecasts for operating earnings and other variables, all normalized by operating assets. Effectively, his model reduces to a return on assets or return on equity type model.

What is a practitioner to do with all these models? Each should be evaluated with three primary criteria: conceptual soundness, empirical robustness, and empirical accuracy. Simplicity should not be the sole criterion, because the capitalist system is extremely complex. Simple models will not be robust, nor accurate enough to handle this complexity.

As explained in the first article of this series, money flows to corporate assets which promise the highest economic returns. Consequently, eliminating cash, inflation, and other distortions from accounting statements becomes crucial to a proper evaluation of economic returns of the underlying business. The higher price / book versus return spread correlations demonstrate the importance of eliminating these distortions. So, any valuation model based on accounting return is not adequate to the task of accurate economic return measurement. These accounting based models include Ohlson's ROA and EVA®. Likewise, ALCAR's margins and capital turns are not economic rates of return measures.

Employing a good estimate of aggregate company economic returns that reflect the underlying project IRR's is a necessary, but not sufficient, condition for a conceptually sound valuation

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[29] Alfred Rappaport, *Creating Shareholder Value: A Guide for Managers and Investors*, Free Press, New York 1986 & 1998.

[30] Alfred Rappaport and Michael J. Mauboussin, *Expectations Investing: Reading Stock Prices for Better Returns*, Harvard Business School Press, 2001.

[31] James A. Ohlson, "Earnings, Book Values, and Dividends in Equity Valuation," *Contemporary Accounting Research*, 1995, 11:661-687. Jing Liu and James A. Ohlson, "The Feltham-Ohlson (1995) Model: Empirical Implications," *Journal of Accounting, Auditing, and Finance*, Summer, 2000, pp. 321-331.

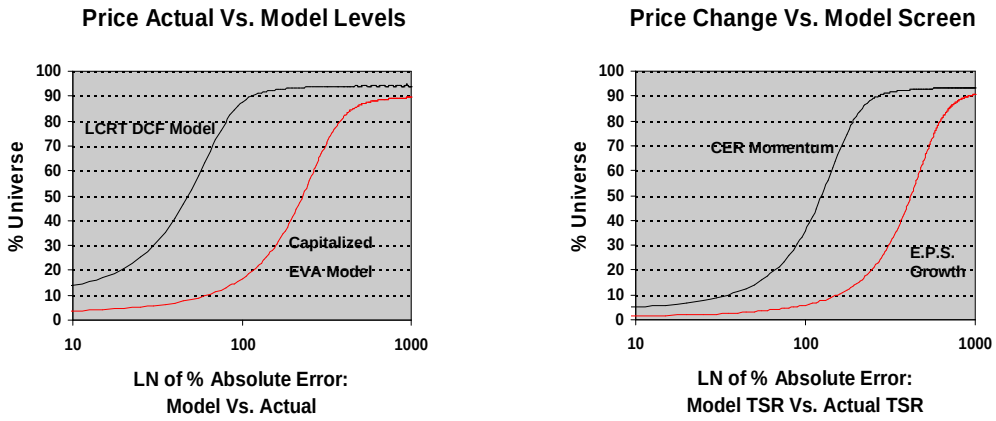
model. The model should reflect the actual life cycles of firms. While the introduction of the exponential fade concept or regression toward the mean return was a paradigm shifting improvement over traditional perpetuities, simple fade does not go far enough to describe observed actual life cycle data. An impulse function is required to describe the behavior of surviving start-up firms. The new Life Cycle Return theory recognizes that smaller firms fade faster, and the observed fade is incomplete. High return firms fade down, but not all the way down, while low return firms fade up, but not all the way up toward the corporate average. A 40 year time horizon forecast, although it imperfectly reflects the finite nature of a firm's life, fails to model drop-outs and capital released from firms going bankrupt or companies being acquired. This is often due to sub-par economic returns. Lastly, the models should incorporate CER momentum and be based in fractile space instead of numerical space. All these major enhancements are necessary to reflect the observed patterns of data as companies follow their life cycle within a competitive economy. Life Cycle Returns plans to present these new models to its clients, but, more importantly, to offer an open platform capability to empirically measure their robustness and accuracy. The platform also enables quick testing of people's hypotheses due to intuitive interfaces based on Excel, connected to fundamental, price, and analysts' forecast databases.[32]

[32] The fourth article covers this point in more detail.

To observe how this measurement methodology will work, please see the charts below. The measurements should quantify the key objective functions of corporate managers and portfolio managers. Corporate managers primarily concentrate on price *levels*, while portfolio managers primarily focus on price *change*. However, this is not exclusive. Corporate managers do want their company's stock to rise, while portfolio managers prefer their owned stocks and buy candidates to be undervalued in the market.

The charts below quantify these key objective functions. The measurements employed in the chart on the left below extend Marvin Lipson's deviation concept to display the natural log of the geometric mean of the per cent absolute error of the model versus the actual stock price for 10 years. Instead of using the averages of the high / low prices, these measurements will compare to the actual price 90 days after the end of the fiscal year to properly account for information disclosure lags. This measurement methodology enables comparison of multiple models explaining price levels for thousands of firms over extended time periods *on a single chart*. For example, the chart below conceptualizes the differences between a LifeCycle DCF model and a capitalized EVA® model, showing the EVA may portray a 250% median error while the LCRT model may show a 50% median error.[33] Additionally, the chart will display the percentage of company-years covered by the model as a measure of its robustness. Many measures fail for some companies for some years. Therefore, robustness can become as important as accuracy in evaluating a model. The chart on the right below conceptually displays differences in TSR price change errors predicted by CER and EPS change.

MEASURING KEY OBJECTIVE FUNCTIONS ACROSS COMPETITIVE MODELS



Practitioners should carefully distinguish models based on actual performance from those based on forecasted performance using security analysts' EPS and sales estimates. Much can be learned about the proper structure of these DCF models by limiting the tests to actual financial

[33] Actual empirical results should be available in the first half of 2003.

statements, before extending these same models to a forecast mode as Ohlson suggests. LifeCycle Returns will analyze the distributions of CER's and gross investment through time for firms of all sizes to create patterns reflecting the data. Well constructed models from the distributional data will allow back-testing those models against actual prices while producing smaller errors than competing models. The key research process triangulates observed life cycle performance, DCF models reflecting that performance, and actual prices. Feedback from model pricing errors will suggest refinements to the model structures and parameters.

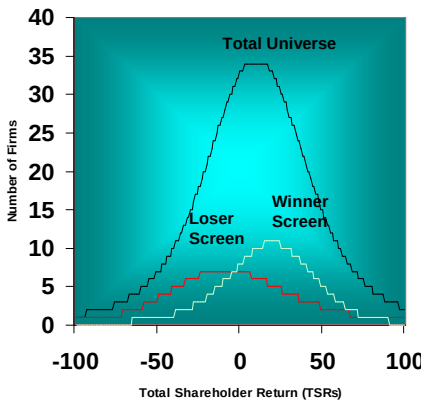
Once created, insights from these models and research will suggest screens useful to achieve superior portfolio investment returns. For example, research suggests that screening on Cash Economic Return one year momentum produces excess returns of 5-10%, since CER is a better, but less used measure of company economic performance. The right graph above conceptually compares these results against the more traditional EPS growth. It shows the 10 year geometric mean percent absolute error of the model total shareholder return against the actual shareholder return, *predicted* over a time period *subsequent* to applying the screen from disclosed performance.

If a simple CER one year momentum screen produces superior results over the period fiscal year plus 3 months to fiscal year plus 15 months, imagine the incremental predictive power of employing quarterly CER data, combined with analysts' EPS and sales forecasts, and compared against market expectations. The market is highly efficient, but not instantaneously so. Consequently, more sophisticated measurements and insights lead to excess returns, until more investors adopt them.[34]

[34] Not every investor applies the same decision rules. Stock purchases and sales based on applying numerous inconsistent DCF models and predictive screens, which produce differing results, add noise to the market. Though violating the strong form of the efficient markets hypothesis, this noise makes beating the market possible, although difficult.

The chart below portrays another analytical method for displaying back test results of screens for a single year. While no screen is perfect, any successful, effective screen should divide a universe into a set of winners and a set of losers. The chart below displays the universe distribution of total shareholder returns, juxtaposed against a loser screen distribution and a winner screen distribution. The screens listed below should prove effective in distinguishing winners and losers: quarterly cash economic return momentum, analysts' forecast CER momentum, EPS surprises translated to CER surprises, current price versus LCRT DCF valuation, and price momentum. Momentum is simply the change from one quarter to the next of a key variable. Historical momentum bases itself on changes in quarterly Cash Economic Return. Forecast momentum translates analysts' forecasts to CER's and subtracts the previous quarter. Translating the traditional analysts' EPS forecasts and surprises into CER forecasts and surprises becomes most important, so all the measurements are comparable. LCRT accomplishes this comparability across firms through time by dividing EPS forecasts and surprises by the constant dollar investor gross cash investment – normalizing by the most important size variable.

Predictive Portfolio Screens Distinguish
Winners From Losers in Subsequent Period With Lower Risk
(Lower "Risk" Means Less Peaked-ness, Less Dispersion, and Greater Right Skew-ness of Stable Parisian Fat Tailed, Non-normal Distributions)



	Loser Screen	Winner Screen
Past Quarterly Cash Economic Return (CER) Momentum	Bottom Quartile	Top Quartile
Analysts' Forecast CER Momentum	Bottom Quartile	Top Quartile
E.P.S. Surprises Translated to CER Surprises	Bottom Quartile	Top Quartile
Current Price versus LCRT DCF Valuation	Bottom Quartile	Top Quartile
Price Momentum	Bottom Quartile	Top Quartile

Although the next article will discuss risk, it is necessary to mention here that another paradigm shift needs to occur with risk measurements, because all the TSR and CER distributions are fat tailed, Stable Paretian ones with infinite variances. Consequently, traditional risk measures, like beta, rest on an extremely mushy foundation.

Conclusion

Why should portfolio and corporate managers care about these paradigm shifts in valuation frameworks and measurements? It will change both their process for making decisions and the actual decisions themselves. A corporate manager who fails to take the life cycle fade into account will likely overpay 50-200% for an acquisition with high economic returns if he assumes a perpetuity of performance. An investment manager, who does not study a firm's life cycle compared to the market's expectations, will find herself continually surprised with the

mysterious TSR performance of her portfolio, particularly if accounting returns trend the opposite direction from economic returns.

Value Management - Past, Present, and Future
Part 3 – Costs of Capital (Investor Employed Discount Rates) and Risk
To Be Submitted to Shareholder Value Magazine

By Rawley Thomas[35]

Abstract: This series of four articles is controversial because it predicts a dramatic paradigm shift[36] in the way practitioners perform corporate finance and portfolio investment management. Following Geoffrey Moore,[37] innovative value management enthusiasts will quickly see the potential for change from this paradigm shift, while visionary early adopters will require more empirical evidence. Early majority pragmatists will demand systematic solutions to all their needs before considering a shift, but late majority conservatives will wait for adoption by academics and practitioners. In the end, skeptics will never adopt.

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Investors, corporate managers, and consultants should calculate Cash Economic Performance to eliminate the distortions of traditional accounting statements and return measures, apply the discount rates investors use to calculate present values, and employ discounted cash flow (DCF) models of firms based on their empirically observed life cycles. Properly created, these life cycle DCF models provide the benchmark for market expectations. Since this new theory does not confirm that the market is instantaneously efficient, measuring a company's quarterly actual and analysts' estimates against the market expectations from the DCF models promises the portfolio manager an investment *process* likely to outperform the market. In turn, these frameworks help corporate managers understand the mysteries of the stock market and grow their strategic investments where the economic returns (NOT accounting returns) exceed both the investor discount rate and market expectations, thereby producing superior stock returns for their company. To achieve these superior corporate and investment returns requires new, more efficient measurements, databases, and research processes. This series of articles describes the concepts behind the new theory. Later articles portray the empirical research and support, upon which the concepts were based.

The previous two articles discussed the usefulness of economic returns as annual company performance measures and valuation frameworks. The first article demonstrated how cash economic returns eliminate the distortions between annual return on assets measures and the underlying project internal rates of return. These improved measures lead to greater insights, resulting in superior decisions for both corporate executives and equity portfolio investment managers. The second article covered how a valuation framework based on the life cycles of

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[35] Rawley Thomas is President of LifeCycle Returns, Inc. (LCRT) in St. Charles, Illinois. He served as Assistant Treasurer of SuperValu Stores, joined Callard, Madden in 1981, co-founded HOLT Planning in 1985, and directed Value Management research for The Boston Consulting Group for eleven years. Credit Suisse First Boston acquired the successor to HOLT Planning, HOLT Value, in early 2002. Thomas has served as Practitioner Director for the Financial Management Association International. Currently, he serves on the DePaul Finance Advisory Board and the Northern Illinois Accountancy Board. He can be reached at Rawley@LCRT.com

[36] Thomas S. Kuhn, *The Structure of Scientific Revolutions*, Third Edition, The University of Chicago Press, 1996.

[37] Geoffrey A. Moore, *Inside the Tornado: Marketing Strategies from Silicon Valley's Cutting Edge*, Harper Business, 1995, 1999, pp. 14-22.

firms provide the benchmark for investor market expectations. This article covers costs of capital or discount rates employed by investors. Discount rates should be calculated from the estimated cash flows from the life cycle patterns of companies and risk should be incorporated into those estimated cash flows, not the discount rates.

Investor Employed Discount Rates

Investor discount rates or costs of capital are central to the vast majority of financial issues and decisions in both corporate finance and investments. A 1% change in the real cost of capital causes a 20% change in value. Small differences in discount rates create large differences in valuation.

Because of its large effect on valuation, cost of capital estimation remains a complex field with a very rich history. All readers, who have ever attended an investment or corporate finance course, have been exposed to the Capital Asset Pricing Model (CAPM), as the traditionally accepted methodology for calculating risk and the cost of capital for a firm. Under CAPM, the cost of equity capital is the risk free rate, r_f, plus a beta risk measure times the equity risk premium, r_m-r_f, in the formula below. r_m is the market rate of return. Beta is the slope of the line between the firm's price changes and the changes of a broad market index.

$$r = r_f + \beta\left(r_m - r_f\right)$$

The theory is elegant, but please consider the possibility that it is wrong! The next few paragraphs summarize many of the reservations raised about the CAPM. Even Harry Markowitz, perhaps the father of modern portfolio theory, had doubts about the theory he was creating. Markowitz raised the possibilities that the theory should not rely on variances and covariances, but perhaps semi-variance, expected value of loss, expected absolute deviation, probability of loss, or maximum loss.[38] Losses become the concept behind dictionary definitions for risk, as opposed to variance, beta, or price volatility. The writer recalls that one of Bart Madden's[39] favorite examples describes a shoe retailer with a very stable business, low beta, and low cash returns. Despite the low beta, indicating low traditional risk, the firm filed for bankruptcy which caused large losses to investors.

Richard Thaler's work also questions the rationality of traditional risk and return measures.[40] In similar veins, Daniel Kahneman, a cognitive psychologist, won the 2002 Nobel prize for research showing people are poor in assessing probabilities, shortsighted, and overconfident in their predictive skills.

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[38] Harry M. Markowitz, *Portfolio Selection: Efficient Diversification of Investments*, Cowles Foundation Monograph, Yale University Press, New Haven, 1959, 1970, pp. 286-303.

[39] Bart Madden carries out research investigating the link between corporate performance and market valuation at CSFB HOLT. He is author of *Cash Flow Return on Investment Valuation: A Total System Approach to Valuing the Firm*, Butterworth Heinemann, Boston, 1999.

[40] Richard Thaler, "The Psychology of Choice and the Assumptions of Economics," *Laboratory Experimentation in Economics: Six Points of View*, Alvin E. Roth, ed., Cambridge University Press, Cambridge, Chapter 4, pp. 99-130.

Evaluating flaws in the fundamental assumptions of modern portfolio theory, market efficiency, and the CAPM, Benoit Mandelbrot began testing the hypotheses underlying Brownian motion. He concluded most all price distributions follow fat tailed, Stable Paretian distributions with infinite variances which are far away from the Gaussian normal distribution.[41] Mandelbrot's results were so computationally and statistically inconvenient that most academics continued to assume normal distributions and associated market efficiency for all their work, despite the strong empirical evidence to the contrary.[42]

Confirming Mandelbrot's work, market pricing of options recognizes fat tailed, non-normal distributions. Consider the "anomaly" of volatility smiles. Options with the same expiration date and different strikes have different implied volatilities. Equivalently, the price exceeds the value implied by the Black-Scholes model assuming an underlying normal distribution of price changes for strikes substantially out-of or into- the money. This difference is commonly called the volatility smile. Its existence contradicts the Black-Scholes assumption that volatility is constant. Stanley Hales, working under J. Huston McCulloch[43] at Ohio State, showed that the anomalous volatility smiles disappear if one replaces the normal distribution assumption in the option pricing formula with a more realistic fat-tailed Stable Paretian one, reflecting the distribution of actual price changes.[44]

To be valid, the CAPM requires two anchors, the market risk premium and the risk free rate. Questioning the validity of the market risk premium, Richard Roll[45] suggested the return on the market and therefore the equity risk premium could not exist because the market portfolio had to include all assets. Traditional indices excluded some assets. The other anchor, the risk free rate, also does not exist in real, inflation adjusted terms. Long term government bonds lost large amounts of wealth, both in nominal and real terms, during the increasing and high inflation rates of the 1970's. T-Bills, the other traditional candidate for the risk free rate, lost 18-20% of their purchasing power each year during 1946-1947. The market expected a return to depression, but actually experienced high, unanticipated post World War II inflation, after price controls were lifted. Even the Treasury issued inflation protected bonds vary in price and yield and therefore do not offer a risk free rate. Consequently, neither anchor for the CAPM actually exists.

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[41] Benoit Mandelbrot, "The Variation of Certain Speculative Prices," 1962, reprinted in Paul Cootner, Ed. *The Random Character of Stock Market Prices*, MIT Press, Cambridge, 1964, pp. 307-332.

[42] Richard Brealey in *An Introduction to Risk and Return from Common Stocks*, MIT, Cambridge, 1969 did acknowledge the fat tailed infinite variance nature of stock price and stock index distributions. Edgar Peters continued this work in two books: *Chaos and Order in the Capital Markets: A New View of Cycles, Prices and Market Volatility*, Wiley, New York, 1991 and *Fractal Market Analysis: Applying Chaos Theory to Investment & Economics*, Wiley, New York, 1994. Fat tailed distributions are consistent with long term memory in the System and the observed imperfect fade of the Cash Economic Return.

[43] McCulloch wrote one of the best methods for estimating the four parameters of the Stable Paretian Distribution. See J. Huston McCulloch, "Simple Consistent Estimators of Stable Distribution Parameters," *Commun. Statist. Simula*. 15(4), 1986, pp. 1109-1136. Using these techniques will become extremely important, because they will enable modeling in the fractile instead of the numerical domain.

[44] Stanley J. Hales, "Valuing Foreign Currency Options with the Paretian Stable Option Pricing Model," presented at the Financial Management Annual Conference, October 18, 1997 in Honolulu. See especially p. 44.

[45] Richard Roll, "A Critique of the Asset Pricing Theory's Tests: Part I: on Past and Potential Testability of the Theory," *Journal of Financial Economics* 4, 1977, pp. 129-176.

Eugene Fama and Kenneth French added fuel to the CAPM controversy, when they found no correlation between the market beta and the average return, after controlling for size.[46] Consistent with their results, this writer's research showed zero correlation between Value Line's beta and a market derived cost of equity. Including a CAPM cost of equity or capital adds noise to empirical correlations with price / book multiples, EVA®, and Cash Value Added models.

Another CAPM problem arises when estimating the market risk premium. Most estimates from historical data have relied on Ibbotson data 1926- present.[47] The geometric mean of large company returns less long term governments 1926 to 2001 was 5.41%; over T-Bills 6.90%; with long term governments over the last 20 years 3.15%; over the last 10 years 4.20%. Using arithmetic means, the equity risk premium of large companies over long term governments was 12.7%-5.7% = 7.0%. The run up in stock prices during the 1990's caused the *measured* equity risk premium to increase, while, in contrast, financial theory suggests prices increase with declining costs of capital. The theory's application appears inconsistent.

Contrast these *historical* equity risk premium numbers generally in the 5-7% range with those *forward* looking ones derived recently from dividend discount models in the 2-3% range. The ones derived from dividend discount models generally rely on finding the equity discount rate which equates the price to the present value of a perpetual stream of dividends, growing at various growth rates to reflect recent trends.[48] Of these academic studies, the writer prefers the forward looking equity risk premiums because they rely on a discounted cash flow model relating prices to future cash flows, although calculated risk premiums less than zero are troubling.[49]

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[46] Fama and French have published several articles on this subject, but their first one, a classic in corporate finance, is "The Cross-Section of Expected Stock Returns," *Journal of Finance*, June, 1992, pp. 427-465.

[47] *Stocks, Bonds, Bills, and Inflation: 2002 Yearbook, Market Results for 1926-2001,* Ibbotson Associates, Chicago. For a longer time horizon, see Jeremy Siegel, "The Equity Premium: Stock and Bond Returns Since 1802," *Financial Analysts Journal*, January-February 1992, pp. 28-46.

[48] Oliver J. Blanchard, 'Movements in the Equity Premium," *Brooking Papers on Economic Activity*, 2: 1993, pp. 75-138.

Ravi Jagannathan, Ellen R. McGrattan, and Anna Scherbina, "The Declining U.S. Equity Premium," *Federal Reserve Bank of Minneapolis Quarterly Review*, Fall, 2000, pp. 3-19.

James Claus and Jacob Thomas, "Equity Premia as Low as Three Percent? Evidence from Analysts' Earnings Forecasts for Domestic and International Stock Markets," *Journal of Finance*, October 2001, pp. 1629-1666.

Robert S. Harris and Felicia C. Marston, "The Market Risk Premium: Expectational Estimates Using Analysts' Forecasts," *Journal of Applied Finance*, 2001, pp. 6-16.

William D. Nordhaus, "The Mildest Recession: Output, Profits, and Stock Prices as the U.S. Emerges from the 2001 Recession," NBER Working Paper 8938, especially Figure 8 based on real return on equity from S&P 500 earnings / price ratios.

Robert D. Arnott and Peter L. Bernstein, "What Risk Premium is 'Normal'," *Financial Analysts' Journal*, March/April, 2002, pp. 64-84.

Eugene F. Fama and Kenneth R. French, "The Equity Premium," *Journal of Finance*, April 2002, pp. 637-659.

Goldman Sachs, "The Equity Risk Premium: It's Lower than You Think." CEO Confidential, November 2002. This article employs dividend discount model and surveys of portfolio managers and chief investment officers.

[49] These anomalous results may relate to the failure to include share repurchases with dividends as a more comprehensive definition of investor payout and yield. See Gustavo Grullon and Roni Michaely, "Dividends, Share Repurchases, and the Substitution Hypothesis," *Journal of Finance*, August, 2002, pp. 1649-1684.

If the CAPM theory is wrong, what new theory will replace it? What paradigm shift will occur? The answer lies in employing more complete forward looking discounted cash flow models of the life cycle of the surviving corporations through their finite lives. A dividend discount model is too simple and not complete enough, because it typically assumes a growth rate into perpetuity. Finding the market derived investors' discount rate which equates the present value of the cash flows to the price of debt and equity produces a cost of capital which is forward looking and internally consistent with the valuation process employed.[50] Using LCRT life cycle discounted cash flow models to estimate costs of capital and the equity risk premium represents a paradigm shift in the theory of corporate finance and portfolio investment.

A skeptic may criticize this proposed methodology as being circular. Those skeptics would be correct, *if* the proposal were a separate discount rate for every company for every year. It is not. This is the same methodology used to calculate yields to maturity for bonds. With the known price and promised cash flows, one can calculate the yield to maturity for the bond. It is the identical methodology Ibbotson employs to calculate equity costs of capital by company and industry from dividend discount models.[51] Although the methodology of using a valuation model to derive investor return requirements has been employed since the early 1980's, academic interest in this method appears to be more recent. Gebhardt, Lee, and Swaminathan employ the Feltham-Ohlson valuation model to derive company and industry costs of capital.[52] Then they correlate that market derived cost of capital to the book / market ratio, forecasted long term growth rate, and the dispersion of analysts' earnings forecasts. Without this last step of correlation to the fundamentals, their methodology would be circular, but it is not. However, the Feltham-Ohlson valuation model does rely on accounting return measures due to its clean surplus assumption, so much of their correlation really reflects noise in the accounting data, not indicative of the firms' economic returns.

Risk Measurement

Bart Madden once offered a keen insight on valuation models. Traditionalists place risk dimensions in the denominator discount rate of present value calculations, but more insights arise from placing those same effects in the model's numerator cash flow descriptions. For example, yield to maturity measures on bonds assume investors receive all the cash interest and principal payments. They don't. Some bonds default. A model including one minus the probability of default times the interest and principal payments would enable the comparison of the *realized* yield between bonds of differing credit quality. Similarly for stocks, some models assume no default. But a more insightful model would incorporate the probability of drop-out from acquisition or bankruptcy and the capital released at the drop-out date. The no-default models would have to incorporate equity risk premiums for leverage, but the more complete drop-out models would not. LifeCycle Returns' anticipated research process will place more and

[50] The actual process will measure the central tendency for the Stable Paretian distribution, the delta location parameter, of firm investor employed discount rates.
[51] Ibbotson Associates, *Cost of Capital Yearbook* and *Cost of Capital Quarterly*.
[52] William R. Gebhardt, Charles M. Lee, and Bhaskaran Swaminathan, "Toward an Implied Cost of Capital," *Journal of Accounting Research*, June 2001, pp. 135-176.

more of the traditional risk effects into the cash flow model, so the costs of capital remain within a very narrow range across companies. Tests of successful refinements will require reduced errors between actual prices and DCF model values. It will also require reduced ranges of costs of capital between companies and industries.

In contrast to the research process just described with one unified model, many would prefer separate parameters for each industry. Adding additional degrees of freedom can increase *apparent* accuracy, but often at the expense of conceptual soundness. Ijiri had this insight: investors should not focus on what assets [or markets] the corporation invests in, only the gross investor cash outlays and gross cash flows generated, all expressed in the same units of purchasing power.[53] The industry should not make any difference to the investor, *unless* the distribution of potential returns is fundamentally different from other industries.

Definitely following differing fundamental distributions are the three sectors: financial firms, unregulated firms, and regulated firms (utilities, telephones, railroads, and to a lesser extent oils and autos)., Regulation tends to narrow the economic rate of return distribution of companies. On regulation, Jude Wanniski[54] caused a fundamental change in the writer's thinking. He demonstrated the extraordinary effect that government intervention and regulation places on the economic system, particularly with his description of the events leading up to the Great Depression. The Smoot Hawley tariff bill caused world trade to contract 90%. A second example of government intervention occurred when raising top personal tax rates from 25% to 79% caused the withdrawal of massive amounts of wealth, as investor return requirements increased. Finally, the Fed's contraction of the money supply and abrogation of the government's promise to exchange paper money for gold completed the interventions. Reading Wanniski's book and supporting Wall Street Journal editorials encouraged the search for patterns of well intentioned, but destructive government intrusion into the economic system. For example, regulation allows utilities to earn a return on their equity, but fails to protect their investors from unanticipated spikes in inflation on their historical dollar rate base. Therefore, utilities selling for less than the inflation adjusted book value of their assets during high inflation periods should be no surprise. Less dispersion of returns and lower traditional "risk" fail to reduce rate of return requirements if those returns are regulated to be less than investor's demanded cost of capital. This negative view of regulation and government intervention is likely to become another provocative paradigm shift in fundamental understanding.

Consequently, LCRT will treat the three sectors of financials, regulated utilities, and unregulated firms fundamentally differently – with different cash economic return distributions and different investor employed discount rates applied to the cash flows. Adjusting the structure of the valuation model is preferable to treating industries within the unregulated sector differently from each other.

Correlating real equity discount rates to the fundamentals produces additional useful insights. Chuck Callard of Callard, Madden performed paradigm shifting work to demonstrate the correlation of the market derived real costs of equity to investor tax premiums on dividends and

[53] Yuji Ijiri, "Recovery Rate and Cash Flow Accounting," *Financial Executive*, March 1980, pp. 54-60.
[54] Jude Wanniski, *The Way the World Works*, Polyconomics, Morristown, NJ, 1978, 1983, 1989.

capital gains in the 1980's. Using Federal Reserve data on equity ownership clienteles shows the households in the top tax bracket still own a vast majority of the equity wealth in the USA. Leverage and CER levels are additional explanatory variables for real costs of equity. This work helps to anticipate stock price effects of structural regime changes in marginal individual tax rates and inflation, since capital gains are not indexed in the USA.

Market Efficiency and Over / Under Valuation

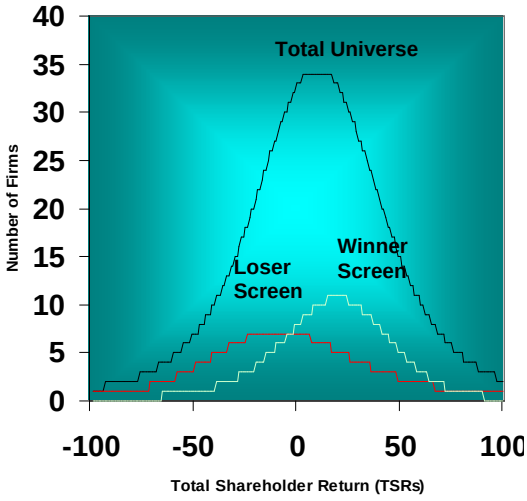
Extraordinarily rich and extensive research on market efficiency exists, although not summarized here. On the one hand, most academics seem to believe stock prices reflect all available information. On the other hand, portfolio investment managers believe they can beat the market averages and surveyed corporate executives believe the market consistently undervalues their companies. The writer has always believed in market efficiency and once advocated index funds as the best method to reduce trading, transaction, and management costs to achieve the highest possible returns with the least risk. Consider Robert Bartley's comment on market efficiency,[55] "My second reason for leeriness about words such as 'bubble' or 'crash' is they're so often used in lieu of analysis. They're typically invoked to explain sharp market movements we don't yet understand." Creating econometric DCF models of stock market value must assume the rationality and efficiency of the market. When the model value and price differ, the question arises – is the stock price right or is the model value correct? Besides research on stock market anomalies – January effect, closed fund discounts, etc. – and the predictive ability of cash economic return momentum, Vernon Smith's controlled laboratory experiment on deviations from fundamental known present values of dividends is the most convincing support for a band of irrationality in traded prices.[56] Based on this evidence, the writer now believes the market is highly efficient, but not perfectly or instantaneously so. LCRT's research process will base itself on this belief with rigorous empirical testing and measurement. See the charts below which were already explained in the previous article. If a DCF life cycle model is accurate enough to gauge under / over valuation, it will accurately predict future shareholder returns as the price / value gap closes.

[55] Robert Bartley, "What's a 'Bubble' Anyway," *Wall Street Journal*, August 5, 2002, p. A11.

[56] Vernon L. Smith, Gerry L. Suchanek, and Arlington W. Williams, "Bubbles, Crashes, and Endogenous Expectations in Experimental Spot Markets," in Vernon L. Smith, *Papers in Experimental Economics*, Cambridge University Press, Cambridge, 1991, pp. 339-371. See also Justin Fox, "Is the Market Rational? No, Say the Experts. But Neither are You – So Don't Go Thinking You Can Outsmart it," *Fortune*, December 9, 2002, pp. 116-126. Not every investor applies the same decision rules. Stock purchases and sales based on applying numerous inconsistent DCF models and predictive screens, which produce differing results, add noise to the market.

Predictive Portfolio Screens Distinguish Winners From Losers in Subsequent Period With Lower Risk

(Lower "Risk" Means Less Peaked-ness, Less Dispersion, and Greater Right Skew-ness of Stable Paretian Fat Tailed, Non-normal Distributions)



	Loser Screen	Winner Screen
Past Quarterly Cash Economic Return (CER) Momentum	Bottom Quartile	Top Quartile
Analysts' Forecast CER Momentum	Bottom Quartile	Top Quartile
E.P.S. Surprises Translated to CER Surprises	Bottom Quartile	Top Quartile
Current Price versus LCRT DCF Valuation	Bottom Quartile	Top Quartile
Price Momentum	Bottom Quartile	Top Quartile

This measurement process requires a paradigm shifting view of risk – with lower risk meaning less peakedness, less dispersion and greater right skewness of the Stable Paretian fat tailed, non-normal distributions of total shareholder return. Alternatively, less risk may mean higher investor wealth utility, weighted by the probability of loss, per Richard Thaler's work.

Conclusion

Investor employed discount rates (costs of capital) permeate the valuation decisions of corporations and investment professionals, because the results are so sensitive to them. This article proposes a paradigm shift toward investor employed discount rates derived from life cycle DCF models in order to avoid the many pitfalls raised with the CAPM and the incomplete nature of dividend discount models. New measures of risk based on loss concepts or the three parameters of fat tailed Stable Paretian distributions will represent another paradigm shift.

Value Management - Past, Present, and Future
Part 4 – Applications and New Processes
To Be Submitted to Shareholder Value Magazine

By Rawley Thomas[57] with Terry Heiland[58]

Abstract: This series of four articles is controversial because it predicts a dramatic paradigm shift[59] in the way practitioners perform corporate finance and portfolio investment management. Following Geoffrey Moore,[60] innovative value management enthusiasts will quickly see the potential for change from this paradigm shift, while visionary early adopters will require more empirical evidence. Early majority pragmatists will demand systematic solutions to all their needs before considering a shift, but late majority conservatives will wait for adoption by academics and practitioners. In the end, skeptics will never adopt.

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Investors, corporate managers, and consultants should calculate Cash Economic Performance to eliminate the distortions of traditional accounting statements and return measures, apply the discount rates investors use to calculate present values, and employ discounted cash flow (DCF) models of firms based on their empirically observed life cycles. Properly created, these life cycle DCF models provide the benchmark for market expectations. Since this new theory does not confirm that the market is instantaneously efficient, measuring a company's quarterly actual and analysts' estimates against the market expectations from the DCF models promises the portfolio manager an investment *process* likely to outperform the market. In turn, these frameworks help corporate managers understand the mysteries of the stock market and grow their strategic investments where the economic returns (NOT accounting returns) exceed both the investor discount rate and market expectations, thereby producing superior stock returns for their company. To achieve these superior corporate and investment returns requires new, more efficient measurements, databases, and research processes. This series of articles describes the concepts behind the new theory. Later articles portray the empirical research and support, upon which the concepts were based.

The previous three articles discussed the usefulness of economic returns as annual company performance measures, valuation frameworks, and investor employed discount rates. The first

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[57] Rawley Thomas is President of LifeCycle Returns, Inc. (LCRT) in St. Charles, Illinois. He served as Assistant Treasurer of SuperValu Stores, joined Callard, Madden in 1981, co-founded HOLT Planning in 1985, and directed Value Management research for The Boston Consulting Group for eleven years. Credit Suisse First Boston acquired the successor to HOLT Planning, HOLT Value, in early 2002. Thomas has served as Practitioner Director for the Financial Management Association International. Currently, he serves on the DePaul Finance Advisory Board and the Northern Illinois Accountancy Board. He can be reached at Rawley@LCRT.com

[58] Terry Heiland is Senior Vice-President of Systems Development for LifeCycle Returns. He founded Micro-Visions in 1982, developed the HOLT/Val product from 1985-1997, and built the HOLT LP Value Search Product from 1991-2001, including database design, fast search capabilities, graphic presentations, and intuitive user interface design. Heiland follows a successful philosophy of "Evolutionary Delivery," described in Steve McConnell, *Code Complete: A Practical Handbook of Software Construction*, Microsoft Press, Redmond, WA, 1993, pp. 664-671. He can be reached at Terry@LCRT.com

[59] Thomas S. Kuhn, *The Structure of Scientific Revolutions*, Third Edition, The University of Chicago Press, 1996.

[60] Geoffrey A. Moore, *Inside the Tornado: Marketing Strategies from Silicon Valley's Cutting Edge*, Harper Business, 1995, 1999, pp. 14-22.

article demonstrated how Cash Economic Returns eliminate the distortions between annual return on assets measures and the underlying project internal rates of return. These improved measures lead to greater insights, resulting in superior decisions for both corporate executives and equity portfolio investment managers. The second article covered how a valuation framework based on the life cycles of firms provide the benchmark for investor market expectations. Using life cycle valuation avoids traditional perpetuity assumptions and more accurately reflects firms' cash flows as companies proceed through their stages of development. The third article covered discount rates employed by investors. In sharp contrast to traditional Capital Asset Model Price (CAPM) theory, discount rates should be calculated from the estimated cash flows from the life cycle patterns of companies. Risk should be incorporated into those estimated cash flows, not the discount rates. This fourth article describes the new applications and processes implied by the Life Cycle Returns, Inc.'s (LCRT's) paradigm shifting theory described in the first three articles. For corporate applications, linking non-financial operating daily measures of efficiency and customer satisfaction to cash economic returns will prove crucial to implementing value management within a firm's culture. For equity portfolio investment managers, creating leading strategic variables and possessing fast platforms for testing and decision making will become critical competitive advantages.

Corporate Applications

To effectively raise shareholder returns, Value Management (VM) must integrate into the corporate processes and culture. Yet, successful integration results have not met corporate management expectations. To determine some of the reasons and solutions, following is a description of the historical accomplishments of VM leaders and a discussion of future implementations employing LCRT's new theory.

In the writer's view, Joel Stern is the father of Value Based Management. Bennett Stewart[61] and Joel Stern put Value Management on the map with their Fortune articles and their continuing development of the practice. They have performed excellent work moving corporate managements away from a simplistic focus on EPS toward a greatly needed concentration on the balance sheet and rates of return. Their work on compensation and credit analysis also deserve recognition. However, LCRT's theory differs substantially with Stern Stewart's approach on EVA® versus cash economic performance measurement, valuation methodology, and cost of capital, as described in the first three articles of this series.

In the author's opinion, Tom Copeland[62], while at McKinsey and now at Monitor, continues his leadership tradition of applying corporate finance, residual income, and traditional costs of capital to corporate clients. As the writer views it, his recent work on real options[63] has extended the professional state-of-the-art. On the other hand, differences between Copeland and LCRT's theory revolve around accounting versus cash economic returns, costs of capital, and the

[61] G. Bennett Stewart, III, *The Quest for Value: A Guide for Senior Managers*, HarperBusiness, 1991.
[62] Tom Copeland, Tim Koller, and Jack Murrin, *Valuation: Measuring and Managing the Value of Companies*, Third Edition, Wiley, 1990, 1994, 2000.
[63] Tom Copeland and Vladimir Antikarov, *Real Options: A Practitioner's Guide*, Texere, 2001.

research process to minimize the degrees of freedom and parameters applied to valuation issues of a large database through time.[64]

Despite the best efforts of various consulting firms vigorously competing against each other in the market place for Value Management (VM) services, the cultural impact of VM has not attained all the results corporate managers would have liked. Why?

Over 22 years, clients consistently offered feedback to simplify Value Management for implementation within their organizations. Nonetheless, some sophisticated clients also graduate from EVA® to CFROI® and faded valuations for compensation purposes and for high stakes decisions in acquisitions or divestitures, as they address problems not handled accurately by the simpler approaches. The tension between simplicity and complexity continues to be a prime issue in client implementations.

One way to avoid complexity is to simplify the measures themselves. Employing conventional accounting returns, EVA®, and 8 X EBITDA multiples follow this path. However, the first article of this series discussed the distortions of accounting returns, while the third article covered the problematical issues with the CAPM cost of capital methods. 8 X EBITDA certainly is simple and probably comes close to the accuracy of the most sophisticated DCF models available. On the other hand, it does not incorporate the balance sheet and may therefore encourage over-investment.

Frankly, the traditional process of avoiding complexity in implementations tends to simplify the sophisticated, robust, accurate measures right out of existence. Here is a different approach. Consider a car. Does one need to be an engineer, a chemist, and an automobile designer to run a car? No, these expert professionals have already performed their tasks before the car is purchased. One does need to possess the driving skills to control steering, acceleration, and breaking, along with knowledge of the rules of the road. Being a doctorate chemist or having a masters in engineering helps extremely little in the "job" of driving a car. Eliminating complexity becomes unnecessary if the user need only manage the "controls" necessary for daily operation, while the complications remain hidden behind the scenes.

In business, the controlling measures people focus on must be relevant to their daily activities and decisions. Traditional financial measures like margins and capital turns are foreign to most non-financial people. Esoteric investment concepts of internal rates of return and costs of capital are even further from the minds of operating people. These concepts are not naturally relevant to their daily tasks. Most people are unlikely to create the bridges between their tasks and these concepts. Companies need a better bridging process of financial investment concepts to people's daily tasks.

Please don't misunderstand. Training operating personnel in financial, economic, and investment concepts is worthwhile, but expecting most people to link their daily activities to abstract financial and investment concepts is unrealistic. Mapping these linkages usually requires the

[64] Copeland and the author plan to discuss the issues head to head at the October 9-10, 2003 Financial Management International Annual Meeting in Denver, if the Reader wishes to understand these differences more completely.

expertise of marketing, finance, accounting, engineering, strategic planning, and other professionals, combined with the knowledge of operating people who know their daily tasks better than anyone else. The financial experts here are like the chemist PhD and engineering MS in the design of the car.

"Activity Based Management" (ABM) can provide the solution to mapping these linkages, because it is a technique for identifying, measuring, and managing the daily activities of people. Directly or indirectly, all activities should add value to the customer or why bother performing them? Implementing ABM effectively usually represents a multi-year process. *Mapping, bridging, and linking the key operating activity based measurements to the line items of the financial statements and then to economic returns becomes one critical means to integrating value management into the firm's daily culture to make it relevant.*

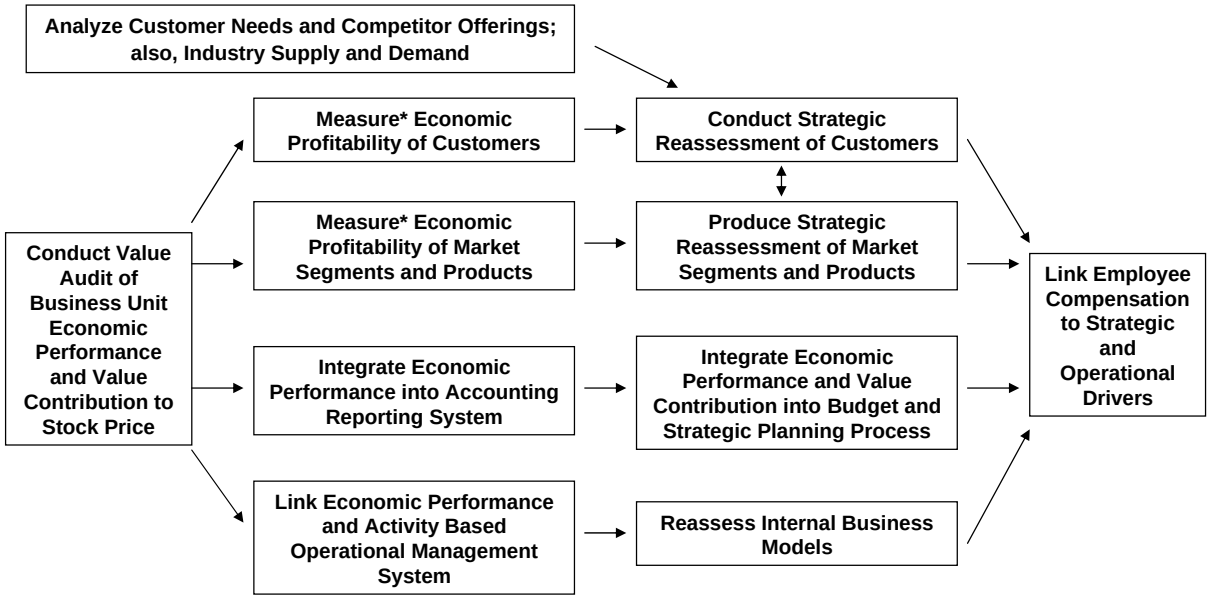
Please consider the diagram below. It portrays a multi-year process for effectively integrating LCRT's new theories of value management into the vital processes within a firm. It's not easy, but nothing ever worthwhile is. The work effort creates a strategic barrier to competitors unwilling to incur the cost.

As shown by the diagram, the first step is usually a value audit of business unit economic performance and value contribution to stock price – historically and planned. Most often, significant differences exist between the accounting return measures and cash economic returns. These improved cash economic return measures lead to better insights, resulting in superior decisions, as reviewed in the first article of this series. Also, management perceptions of worth often differ materially from the valuations produced from LCRT's sophisticated DCF life cycle models. Reconciling those differences produces fresh insights and enhanced executive judgments on value decisions. A second step links the measures from the activity management system to economic performance. This linkage process provides the allocations necessary to measure the economic profitability of customers, market segments, and products. It's better to be approximately correct than precisely wrong in these measures because perfection in allocations is the enemy of the good.

Armed with the economic profitability of customers, market segments, and products combined with an analysis of customer needs and competitor offerings, the company has the fact base to conduct strategic reassessments of its customers and products. This type of strategic information on economic profitability is becoming more and more important to survive and thrive. Facts are our friends.

Parallel to these efforts, integrating economic performance and valuation into the accounting system, budgeting, and strategic planning process occurs. The integration process completes its first round in 1-3 years. Second and future rounds of refinement require much less time.

INTEGRATING VALUE MANAGEMENT INTO A FIRM'S CULTURE (A MULTI-YEAR PROCESS)



*** It's better to be approximately correct than precisely wrong. In allocations, perfection is the enemy of the good. Facts are our friends.**

Mark Ubelhart[65] suggested devoting 15-20% of the time within each of the above boxes on the implications for employee compensation. Then, when the firm reaches the final box on the far right linking employee compensation to strategic and operational drivers, most of the work will have been completed. If the company faces a crisis, short term changes in compensation are most probably necessary, before the other processes have been completed.

Boutique consulting companies helping clients through these processes include Lucas[66] Group of Boston, MA, Riley[67] Associates of Fairfax, VA, Vanguard Partners[68] of Ridgefield, CT, and Dorset Consulting[69] of Palatine, IL. Boutique firms specializing in Value Management training include Helfert Associates[70] and Vanguard Partners.

Portfolio Investment Applications and Processes

With Tony Rossitto[71]

Steep losses during the last 2-3 years, fraud, and conflicts of interest will change the way investment organizations practice their profession. More research will be brought inside with faster enterprise-wide platforms to share results and test new hypotheses. The focus will change from individual firm analyses and estimates toward competitive models of the interaction of all companies within an industry. In addition, models will measure how industries interrelate to form the economy. More exception analyses will attempt to identify fraud and accounting changes sooner. The models and exception analyses will incorporate Cash Economic Returns and life cycle DCF approaches, in addition to the more traditional P/E's, EBITDA multiples, and price / books.

One commentator, John Boyle[72] observed that estimates from brokerage firm sell-side analysts represent an unavoidable conflict of interest, because their business is to sell stock! "There is no evidence that research … adds value, [because][73] stock prices incorporate virtually all [public, widely available] information. … While the value of an original, comprehensive, and insightful research study becomes zero at the moment it becomes available to all market participants, the value of the same study by the research department of a single institution remains as long as the information remains proprietary. … [The] responsibility for most security analysis and research

[65] Practice Leader, Corporate Finance/Executive Compensation for Hewitt Associates, LLC with expertise in linking business-performance measurement, valuation, goal-setting, and strategic planning.
[66] Jay Lucas, Managing Director and Founder of the Lucas Group, previously principal in Bain.
[67] Mike Riley, previously CFO of United Airlines and the U.S. Postal Service.
[68] Roy E. Johnson, partner, author: *Shareholder Value – A Business Experience*, Butterworth Heinemann, 2001. Specializes in linking value-based financial performance to business strategy, surrogate financial drivers, invested capital intensity, and the value profit margin (an "earnings" metric linked to value creation).
[69] Janet Zelinka, previously CFO IT for Ameritech, VP of IT Program Management and Prioritization for SBC; installed activity based management within the IT organization.
[70] Eric Helfert author of *Techniques of Financial Analysis: A Guide to Value Creation*, 11th Edition, McGraw-Hill Irwin, New York, 2003.
[71] Tony Rossitto is Vice-President of Fleet Investment Advisors in Hartford, CT.
[72] John C. Boyle, "Reality Bites," *Wall Street Journal*, November 21, 2002, p. A16.
[73] Bracketed words and phrases are the author's additions.

will gradually shift from the sell-side – with its present conflicted motives and unsatisfactory outcomes – to the buy-side, [internal], independent, and proprietary." Boyle states these changes well!

Bill Alpert summarized several ways to fix the internal research problem faced by buy-side organizations[74] - simplify within the data limitations, focus on the not-too-distant future, highlight sensitive assumptions, discuss the incremental effect of an event, shun spurious precision, report forecast errors, collect leading real-world strategic data, discuss what you don't see, help others within your firm replicate your results, and leave an intellectual paper trail. In addition, Michael Mauboussin of Credit Suisse First Boston suggests a three step procedure for investment decisions. The first step is a strategic assessment, reviewing the industry structure – barriers, rivalry, substitutes, customer power, and supplier power – and competitive position – strategic choice, cost, differentiation, and focus. The second step runs the estimates derived from the first step through a set of valuations models. The third step quantifies expectations versus today's stock price – over-valued, fairly valued, or under-valued. While Mauboussin's procedure is sound, refinements from LCRT's theory perfect the process. Research confirms that Cash Economic Returns and revenue are more stable at the industry level than at the company level. These measures are even more stable at the economy level than at the industry level. Therefore, the strategic assessment process and analyst forecasts must incorporate these known stabilities. The popular Schwab commercial shows that the "buy, buy, buy" mentality is totally one-sided, because for every "buy," there must be a "sell." If the industry analyst picks a winner, she must simultaneously pick a loser and explain her strategic reasons for both choices. Developing these industry and economy models becomes most challenging. Engaging strategic consulting firms – McKinsey, The Boston Consulting Group, Bain, etc. – to help create these industry models becomes one method to supplement inside knowledge with outside in depth *strategic* expertise and key drivers.[75] Hiring industry experts or consulting firm industry practice area experts represents another. The models created should measure each company and industry relative to its fractile position in the sales, gross cash investor investment, and Cash Economic Return distributions. Modeling in fractile space automatically produces losers with winners. Creating these comprehensive, buy-side models represents a paradigm shift for the investment industry.

Bridging buy-side models with professional beliefs becomes critical to an integrated investment process. Portfolio managers and buy-side security analysts each possess their own set of beliefs about how the stock market functions. These beliefs translate into sets of valuation models and universe screens for selecting stocks. For example, valuation models include dividend discount, capitalized EVA®, growth EVA®, capitalized cash value added, time fade, and life cycle ones. Screens include price momentum, EPS momentum, positive EPS surprises, low P/E's or price / books, and undervalued stocks relative to a valuation model. To achieve buy-in from skeptical professionals for any decision process change requires their extensive participation in rigorously testing these valuation models and selection screens. With increased pressures for performance, the industry needs more standardized, quantitative ways for measuring the accuracy of valuation models and the predictive ability of various screens.

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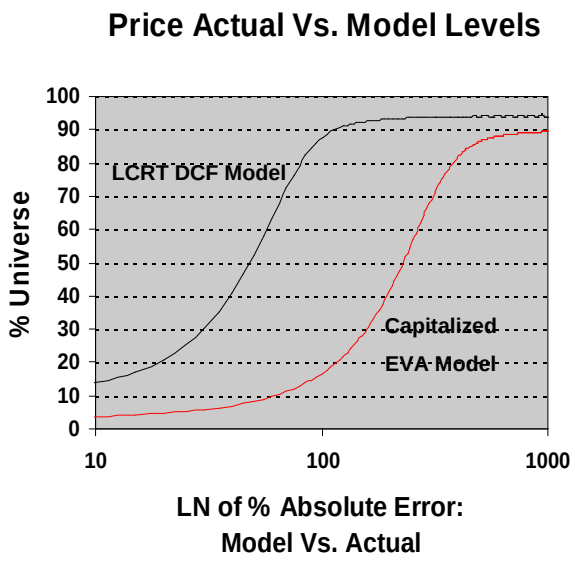
[74] Bill Alpert, "Now Hear This. Wall Street Research Stinks. Here's How to Fix It," *Barron's*, December 2, 2002, pp. 23-26.

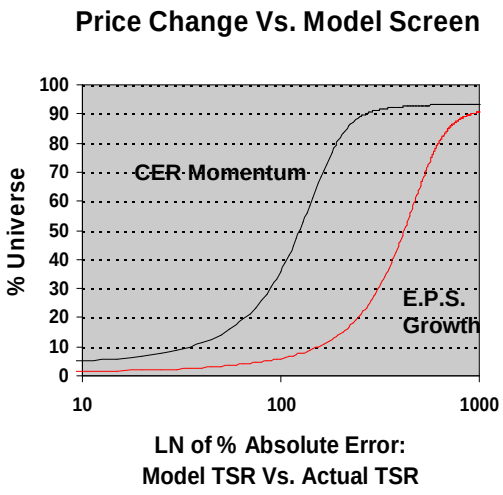
[75] Strategic consulting firms have a reluctance similar to investment banking firms to become closely involved in a process very likely to identify one of their clients as a sell candidate.

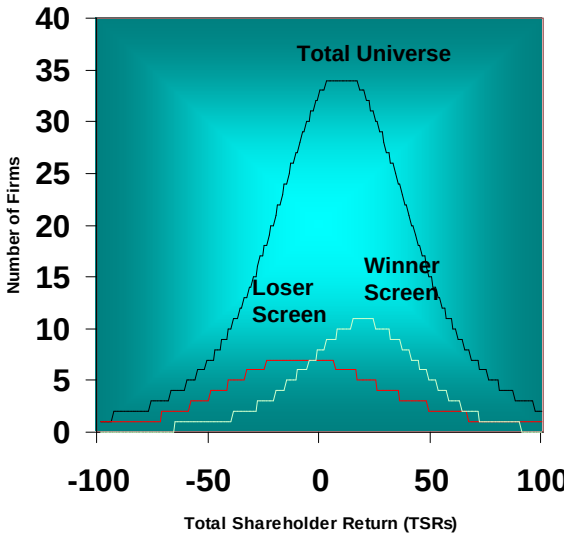
To create this measurement process, recall the deviation statistic, created by Marvin Lipson in 1985. That statistic measured the percent difference between the high / low actual prices and the time fade valuation model value over a ten year period as a geometric mean. Measuring the ten year geometric mean difference between the valuations of *multiple* models compared to the stock price 90 days after the fiscal year assures the market's reaction to the release of all company information. LCRT will then compare all the valuation models and model permutations on a single chart for a large universe. Note the benefit of performing this set of tests *before* incorporating sell-side security analysts' forecasts of sales and EPS. This process will narrow the valuation models and their structural permutations to those versions with minimum errors and the greatest coverage. After this narrowing process, the best models will incorporate forecasts. See the chart below for a conceptual[76] example comparing two models.



[76] Actual experimental results anticipated in the first half of 2003 on the accuracy of both models to explain stock price levels and screens to predict shareholder returns.

The next step in the research process extends the above measuring methodology to quantifying the difference between subsequent total shareholder rates of return (TSR's – price *changes*) and model TSR's achieved, based on the screens used. The left chart below conceptually illustrates how this methodology will portray different screens on the same chart for the entire universe over ten years of testing. For each screen, a robustness measure will show the percentage of company-years covered by the screen. For example, a meaningful EPS growth rate cannot be computed if EPS is negative in the base period, so that company-year will be excluded from the summary of geometric mean errors. Screens should be both accurate and robust – that is, they should cover a larger portion of the universe and the boundary conditions better than other screens where the calculations break down. The right chart below displays results for a single year.





Now follows a description of an investment organization enterprise-wide platform for both performing the research illustrated above and updating the data used for buy and sell decisions. The platform's design lets the facts more quickly lead toward greater understanding of the economic and market processes.

The design of the platform should follow the principles of time based competition. Time becomes a very important dimension of competitive advantage according to one text.[77] Eliminating the time required to complete a core process makes the organization more responsive to customer needs and competitive pressures. Certainly, research is a core process in investment management. The rising volume of data and information makes the filtering speed of the research process critical to conserve limited professional time for its highest uses. Consequently, speeding up the research process becomes an extraordinary important competitive advantage.

[77] George Stalk, Jr. and Thomas M. Hout, *Competing Against Time: How Time-Based Competition is Reshaping Global Markets*, Free Press, New York, 1990.

Typically, IT designs minimize the time for research processes by coding the calculations into the fastest language, C++, Java, Visual Basic, FORTRAN, etc. This design misses the point of time based competition. What really counts is the turnaround time for the entire research process, not the calculation speed on a single company, even if 20-40% faster. Employing Excel as the nucleus core of the calculation processes reduces the elapsed time for research projects 85-95%, because it places the calculation capability directly in the hands of the security analyst or portfolio manager by avoiding handoffs to programmers to recode the calculations into another language. Using the Excel design reduces research projects from weeks to days and hours.

The Excel centered design also helps in other ways. It makes the calculations clear to users and rapidly identifies vendor errors and calculation bugs. Having one set of sheets for production and another for user calculations enables users to specify quickly their own proprietary models and testable hypotheses. Trusted colleagues can replicate user's calculations and results. Employing Excel does require solutions to the non-trivial problems of integrating input databases with Excel from multiple vendors, producing Excel linked output databases, minimizing speed concerns, and establishing smooth production processes on the universe or subsets. It also requires making complex calculations, which are beyond Excel's capabilities, entirely transparent with numerical audit trails. These complex calculations include valuation models, investor employed discount rates, plant inflation adjustments, and fractile transformations.

The Excel nucleus connects to a number of databases – annual and quarterly financial statements, monthly and daily prices, annual and quarterly sell-side analyst estimates plus the investment firm's own internal proprietary estimates from the industry and economy strategic assessment process outlined above. The enterprise-wide platform enables shifting precious professional time from simply performing calculations to the strategic assessment process, where it has higher value added to reduce portfolio turnover and achieve higher excess returns. Although the platform standardizes calculations for the organization, it also encourages the creativity and participation of the firm's professionals. A single model or set of screens does not accomplish these objectives of employee participation and research breadth. This discussion above described a research and measurement process for quantifying the robustness and accuracy of DCF models and portfolio predictive screens to be used by the firm's professionals. Tested accurate valuation models and predictive screens immediately roll over into production.

A production process through the Excel nucleus saves useful output variables to a set of databases.[78] Production with new vendor data runs monthly, weekly, or daily to create output. A screening program employs the output data to identify buy and sell candidates. It also extracts data into Excel or SPSS for research data analysis to refine the models and predictive screens using the methodologies suggested previously.

The investment firm could develop the enterprise-wide platform described above internally. Internal development keeps the capability entirely proprietary, but the risk of developing large new systems which fail to work well within a culture is quite high.[79] Outside vendors and

[78] Production spreads over multiple computers to reduce elapsed time.

[79] For a discussion on what goes wrong with large installation of customer relationship software, see "How to Rescue CRM," *McKinsey Quarterly*, 2002, Number 4 Technology. The same risks apply to all large system installations.

outsourcing become another alternative, perhaps less expensive and perhaps less risky, because the systems are already developed and the cost spread over multiple users.[80] With an outside vendor, the investment organization should plan for the contingency of taking over the system if the vendor fails to perform. The outside vendor should provide the ability to the investment firm to add its own derivative proprietary intellectual property. Extracting data to other systems must be uncomplicated.

Once analyzed for accuracy and robustness, the investment firm may wish to share its models and screening results with the managements of the companies comprising its portfolio. This sharing helps managements understand investor objectives and expectations, far beyond the request for next quarter's EPS estimates. Better management focus on specific investor objectives and expectations will reduce portfolio turnover and the associated costs. The process helps management fulfill their primary responsibility as investors' agents.

Detecting Fraud

With the bankruptcies of WorldCom, Enron,[81] and others, investment managers increasingly focus on early signs of fraud. To detect fraud and other potential problems, Howard Schilit's CFRA[82] offers an excellent service conducting due diligence and interrogating company reporting using a review of firm accounting policies and traditional financial ratio analysis. To supplement this ratio analysis, the Cash Economic Return (CER) and the LCRT framework provides early warning flags, although it will not directly detect fraudulent reporting. In contrast to traditional analyses, normalizing all the data by the investor current dollar gross investment makes the analyses much more comparable across companies through time. For example, periodically reviewing the trends of gross asset mix and each element comprising the CER identifies the discontinuity in gross plant produced by fraudulently capitalizing expenses at WorldCom.

Conclusion

This last article summarizes applications of LCRT's paradigm shifting framework to corporations and investment organizations. On the corporate side, it suggested a drill down of the Cash Economic Return (CER) and valuation measures into customer segments and products, with employees rewarded on the key operational and strategic drivers derived from an activity based management process. On the investment side, it described a highly efficient platform with a measurement process to identify the most accurate valuation models and predictive screens.

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[80] For a discussion of outsourcing critical, but non-core functions, see Geoffrey Moore, *Living on the Fault Line*, HarperBusiness, discussed in "Focus on the Core: A Talk with Geoffrey Moore," by Bill Mahoney, *Shareholder Value Magazine*, November/December 2002, pp. 48-51.

[81] Equity accounting, like that practiced by Enron, conceals debt in unconsolidated subsidiaries and tries to fool not only investors, but also management, on performance measurement and valuation. The writer prefers IAS proportionate consolidation.

[82] Howard Schilit, *Financial Shenanigans: How to Detect Accounting Gimmicks & Fraud in Financial Reports*, 2nd ed., McGraw-Hill, New York, 2002. Schilit is President for the Center for Financial Research and Analysis (CFRA) in Rockville, Maryland.