❖ Contrarian Research Report ❖

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❖ Contrarian Views and Ideas ❖

Subject: Utilities Then and Now

Studies In Absurdity

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I - The Situation

During the period from October 3, 2005 to October 20, 2005 utility shares experienced a significant decline. The Dow Jones iShares Select Utility Exchange Traded Fund (IDU) may be used to measure the extent of the decline. On October 3, this ETF closed at $83.12 and on October 20th a price of $73.04 was recorded at the close. The decline in percentage terms was 12.07%. Such declines are not without precedent. However, a decline of this magnitude over the course of 17 calendar days is quite unusual.

The ostensible reason for the decline was concern over the future direction of inflation pressure. The Producer Price Index (All Items CPI-Urban U.S. City Average) increased at the rate of 1.2% in September following a 0.5% increase in August and a 0.5 % increase in July. All of these figures may be referenced on the website of the U.S. Bureau of Labor Statistics (www.bls.gov).

The prevailing belief was and remains that rising oil prices will generate a dangerous level of inflation that can only be controlled by further extensive increases in interest rates. Yet, interestingly, during the period of utility index decline, oil prices also declined from roughly $70 per barrel to roughly $60 a barrel. Naturally, such a decline in energy prices was accompanied by a decline in energy stocks that actually exceeds in magnitude the decline in utility shares. This can be measured with the use of two energy related Exchange Traded Funds. These are the Dow Jones iShares Energy (IYE) and the S&P Global Energy iShare (IXC). The difference between the former and the latter is that the latter includes shares of non-U.S. energy firms such as BP, Total, Norsk Hydro, Royal Dutch Petroleum, Repsol and EVI. The energy share price decline commenced some days earlier than the utility decline. On September 29, 2005 the IYE ETF closed at the price of $92.70 per share. On October 20, 2005 these had descended to a price of $78.05 for a percentage decline of 15.8%. The IXC ETF declined from 103.17% to $87.64 n the same time-period. The decline is 15.05%.

The reader might find that the simultaneous existence of inflationary fears and fear of an oil price collapse to be two mutually exclusive possibilities. This may indeed be true. Consequently, utility shares and energy shares are generally but not always uncorrelated. Obviously, if the current rate of decline continues, the U.S. utility industry should reach the status of worthless assets no later than Valentine's Day 2006. Moreover, oil should be a worthless commodity by mid winter. It should be self evident that these price patterns are self-correcting.

Readers seeking an explanation as to why investors exhibit such seemingly paradoxical investment actions will need to seek elsewhere. Very little work has been done on the mentality of crowds. All that can be offered by this paper is to refer the reader to the works of Charles Mackay, George Rudé, Gustove Le Bon and Charles Kindleberger. [1]All of the

[1] Charles Mackay is the author of the classic "Extraordinary Popular Delusions and the Madness of Crowds". George Rudé was actually a historian specializing in French Revolution. Works of this author include, "The Crowd in the French Revolution", "The Crowd in History", and "The Face of the Crowd". Gustave Le Bon is the author of the now classic work entitled "The Crowd". The work is a product of the 19th century as is Mackay's book. Le Bon also wrote "The Psychology of the Great War". Charles Kindleberger is the author of "Manias, Panics and Crashes". Interested readers might also try a work entitled "Tulipomania" by Mile Dash. Nevertheless, since history records episodes of dramatic increases in energy prices, it may be illuminating to study utilities during the most inflationary period of the past century. This is, of course, the decade of the 1970's. The next sections of this paper will focus upon this period of history as an undertaking.

works cited are available in English although Le Bon originally wrote in French. Francophone readers can access the monumental study by Edgar Faure of the Mississippi Bubble entitled “La Banqueroute de Law”.

This paper can also not offer any insight into future inflationary trends or the future direction of energy prices apart from the obvious reality that inflation and commodity price collapse are mutually exclusive possibilities.

II - The Inflationary Era of the 1970’s

In order to comprehend the position of utilities in the 1970’s, it is first necessary to have an appreciation for the magnitude of the inflationary pressure generated during the decade. The following table, derived from data compiled from the U.S. Department of Energy lists the average annual oil price from 1970-1980. It is important to note that this is an average annual price instead of a price on the last trading day of every year. The Department of Energy quite justifiably calculates the data in this manner because it is more representative of the prices actually paid for oil throughout a given year. There always exists the statistical likelihood that the year-end price will represent the yearly low or high point for some years. If so-called “point-to-point” data of this type were used, one would naturally assume that this price extreme was available to purchasers throughout the year, when in actuality purchasers may have been paying considerably different prices.

Average Annual Crude Oil Prices 1970 – 1980
As Calculated by The US Department of Energy

1970	$ 3.39	per barrel
1971	$ 3.60	per barrel
1972	$ 3.60	per barrel
1973	$ 4.75	per barrel
1974	$ 9.35	per barrel
1975	$ 7.67	per barrel
1976	$ 13.10	per barrel
1977	$ 14.40	per barrel
1978	$ 14.95	per barrel
1979	$ 25.10	per barrel
1980	$ 37.42	per barrel

It is important to emphasize, but probably difficult to convince the reader, of the remarkable subjectivity of this apparently objective data. First, there are different grades of crude oil. For instance, the New York Mercantile Exchange trades two main varieties of crude oil. These are light sweet crude oil and Brent blend. The latter is based on a light, sweet North Sea oil. The word sweet refers to low sulphur content. Light oil is more desirable than heavy crude. The term light actually refers to specific gravity. The light crude yields proportionally more gasoline, diesel fuel, and jet fuel so that these are more profitable than refined products from heavy crude. Thus, light crude trades at a premium to

heavy crude. If one wanted to demonstrate how expensive oil has become, the writer will quote a light crude. If one wishes to demonstrate the reverse or minimize the current absolute price level, one would quote a heavy crude.

Similarly, NYMEX crude traded at $55.67 per barrel in October 2004. It closed the year on NYMEX at $43.45 per barrel. Yet, the U.S. Department of Energy quotes oil in 2004 at $37.66 per barrel. The NYMEX figure reflects the fact that Hurricane Ivan in September 2004 damaged undersea pipelines in the Gulf of Mexico and reduced U.S. energy production by 25% for several months. The U.S. Department of Energy calculation would somewhat mute this element of volatility.

This rather lengthy explanation is provided so that the reader will have sufficient background information to understand why utilities in the 1973-1974 period declined substantially in price during an inflationary episode and utilities did not decline in price during the much more serious inflationary episode of 1977-1980. From October 1971 to February 1974, the CRB commodity index increased from 96.40 to 237.80. This is an increase of about 146.7%. However, the average annual Consumer Price Index increased by only 4.9% per annum. In the period August 1977-November 1980, the CRB commodity index increased by 82.8% while the consumer price index increased by a compound annual rate of 10.2%. In both periods regulatory commissions permitted rate increases such that utilities could earn their authorized rates of return. Indeed, the commissions could not do otherwise since their freedom of action is severely circumscribed by over 100 years of statutes and case law. In the latter period, investors came to comprehend the realities of inflation. The CPI reflected only minimal inflation in 1971-1974.

It should not be surprising that the realities of inflation were poorly understood in the 1973-1974 time period. The investors of that era had no experience with this phenomenon, As an illustration, let us reflect upon the average annual oil price as calculated by the U.S. Department of Energy from 1946-1970.

Average Annual Crude Oil Price 1946-1970
As Calculated by the U.S. Department of Energy *($ per barrel)*

1946	$ 1.63	1955	$ 2.93	1963	$ 3.00
1947	$ 2.16	1956	$ 2.94	1964	$ 2.88
1948	$ 2.77	1957	$ 3.00	1965	$ 3.01
1949	$ 2.77	1958	$ 3.01	1966	$ 3.10
1950	$ 2.77	1959	$ 3.00	1967	$ 3.12
1951	$ 2.77	1960	$ 2.91	1968	$ 3.18
1952	$ 2.77	1961	$ 2.85	1969	$ 3.32
1953	$ 2.92	1962	$ 2.85	1970	$ 3.39
1954	$ 2.99				

The 1946-1947 prices are legacies from price controls of this key national security related commodity imposed during World War II. Yet, even if one measures the average annual price increase from 1946-1970, the rate of change is only 3.1% per annum. Measurement from the more appropriate data point of 1948 results in rate of price increase of 0.9% per annum. The decade prior to the Second World War was a deflationary episode in world history. Hence, the notion of inflationary pressure was entirely outside of the practical experience of the investment professionals of 1973-1974. It is also worthy of note that this paragraph should serve as another instance of the danger of "point-to-point" data analysis. One of the unspoken assumptions of modern investment analysis is that any "point-to point" data reference is meaningful information, whereas it is actually likely that most "point-to point" data reference is simply random statistical noise.

The Federal Reserve did take action to arrest the inflationary trend generated by oil price increases. In order to comprehend the manner of the Federal Reserve approach to the problem it is necessary to place the oil price increase in a contemporary context. The average price increase from 1972-1974 was 160%. This would equivalent to an increase in NYMEX light sweet crude from the December 2004 close of $43.45 to $112.84. The current price is not to far from $60 per barrel. It would probably correspond to $6.00 per gallon gasoline prices. It is difficult but not impossible to imagine filling a 20 gallon gasoline tank for $120. The price increase from 1972 to 1980 was 939%, This would correspond to a current NYEX light sweet crude price of $451.45 per barrel. In gasoline terms, this would correspond to a price $23.69 per gallon. It is quite impossible to imagine filling a 20 gallon tank for $473.78. A rather plausible argument in 1973 might have been that oil is trading completely outside of its historical range and therefore in due course the price should revert to its mean value.

It is in this context that the Federal Reserve increased the Federal Funds rate. The average Federal Funds rate for the period 1970-1980 is tabulated below:

Federal Funds Rate 1970-1980
Source: Federal Reserve Bank

1970	7.17%	1976	5.05%
1971	4.67%	1977	5.54%
1972	4.44%	1978	7.94%
1973	8.74%	1979	11.20%
1974	10.51%	1980	13.35%
1975	5.82%		

Since these are only yearly averages, these do not provide sufficient granularity to experience the magnitude of the rate increases of the period. Such granularity can be provided by the monthly figures as noted below:

Monthly Federal Funds Rate
1972-1974

Jan 72	3.50%	Jan 73	5.94%	Jan 74	9.65%
Feb 72	3.29%	Feb 73	6.58%	Feb 74	8.97%
March 72	3.83%	March 73	7.09%	March 74	9.35%
April 72	4.17%	April 73	7.12%	April 74	10.51%
May 72	4.27%	May 73	7.84%	May 74	11.31%
June 72	4.46%	June73	8.49%	June 74	11.93%
July 72	4.55%	July 73	10.40%	July 74	12.92%
Aug 72	4.80%	Aug 73	10.50%	Aug 74	12.01%
Sept 72	4.87%	Sept 73	10.78%	Sept 74	11.34%
Oct 72	5.04%	Oct 73	10.01%	Oct 74	10.06%
Nov 72	5.06%	Nov 73	10.03%	Nov 74	9.45%
Dec 72	5.33%	Dec 73	9.95%	Dec 74	8.53%

It is evident at a glance that the interest rate situation in 2005 is radically different than that of the 1972-1974 era. In the latter case an interest rate of 3.5-4% represented accommodative monetary policy. In 2005, there are not a few well respected analysts that publicly wonder whether or not a 4% interest rate will provoke a recession.

The U.S energy industry action prior to 1974 is also worthy of comment. The U.S. was the world's largest energy producer roughly 30 years ago. The U.S. rig count, according to Baker Hughes, exceeded 2800 rigs at various dates in 1956. The rig count has declined to less than 1000 rigs in April 1972 (see rig count data at Bakerhughes.com).

Subsequent to 1974, Baker Hughes began to calculate the worldwide rig count. The yearly average worldwide working rig for the period 1975-1980 were as follows:

Worldwide Rig Count 1975-1980
Source: Baker Hughes

1975	2,722
1976	2,791
1977	3,217
1978	3,603
1979	3,659
1980	4,602

The worldwide rig count reached an all time high level in December 1981 of 6,227. The 2005 average rig count as of September 2005 was 2,856. Although the current figure is remarkably similar to the 1975 figure, Baker Hughes had no reliable means of obtaining data on Soviet, Chinese or Romanian rigs in 1975. The current figures are an actual worldwide total. It is possible, but not verifiable, that the 2005 figure represents a rig count decline from the 1975 figure. A rig count of 6,227 was required to arrest the oil price increases of the previous decade. A Federal funds rate of 19.1%, recorded in June 1981, was required to arrest the inflationary tendencies of the period. The world is still far from these draconian measures. Nevertheless, this was the environment in which utilities operated between 1970 and 1980.

III – The Utility Experience 1970-1980

The utility industry has altered significantly since 1970. Various companies that existed as independent firms in 1970 are now part of larger enterprises. There are also now various merchant energy firms that are unregulated and that did into exist in 1970. Hence, the best way to make comparisons is to find firms that exist today in more or less the same form as these existed in 1970. The phrase more or less must be liberally applied since, as will be observed presently, even the firms listed are rather different than their 1970 incarnations.

The comparative exercise will be conducted with seven examples. Theses are Florida Power and Light, Southern Company, Southern California Edison, Arizona Public Service, Middle South Utilities, Texas Utilities and Duke Power. These entities correspond to the modern FPL Group, Southern Company, Entergy, TXU, Pinnacle West and Duke Energy, respectively.

Data regarding the experience of these firms in the 1970-1980 time period has been extracted from the Moody's stock manuals of the era. The first firm to be examined is Florida Power and Light. Its data is tabulated below:

Florida Power and Light

	Div Per Share	Payout Ratio	Price Range	P/E Ratio	Avg. Yield
1970	$ 1.02	52%	37 1/2 - 27 1/2	16.4	3.1%
1971	$ 1.06	41%	38 1/8 – 28 1/8	12.9	3.2%
1972	$ 1.10	41%	44 3/8 – 28	13.5	3.0%
1973	$ 1.16	38%	40 3/8 – 23 3/4	10.4	3.6%
1974	$ 1.33	48%	29 1/4 - 13 1/2	7.7	6.2%
1975	$ 1.44	42%	27 3/8 – 15 3/4	6.2	6.7%
1976	$ 1.56	65%	28 7/8 – 20 3/4	10.4	6.3%
1977	$ 1.66	44%	28 5/8 – 21 1/2	6.6	6.6%
1978	$ 2.00	44%	29 3/8 – 23 5/8	5.8	7.5%
1979	$ 2.32	55%	28 7/8 – 24 1/8	6.3	8.8%
1980	$ 2.64	67%	28 1/8 – 19 7/8	6.1	11.0%

Assuming purchase in 1970 at the midpoint of the Florida Power and Light trading range and sale in the middle of the 1980 trading range, the return would have been a completely unsatisfactory, but nonetheless positive 36.4%, or roughly 3.2% per annum. It is below the 7.6% annual inflation rate for the period in question. Trading ranges are used rather than point-to-point analysis since one must make an assumption about dividend reinvestment throughout the year and, as well, eliminate the possible bias of an inadvertent high or low price being recorded at year end which would distort the period return. Moody's employs this method and it is arguably superior to the point-to-point approach. The S&P 500 generated about 7.9% per annum in return during this time period, or roughly comparable to the inflation rate. However, this was only possible because many energy firms quadrupled in value. Some firms such as Halliburton appreciated ten fold.

It does not appear that anyone has calculated the S&P 500 return without energy during this time period. If one were to assume that the average energy related firm increased by 500% during this time period and that energy averaged 15% of the index during the-period, one might crudely estimate the energy contribution via the following approach. Appreciation of 500% is equal to a coefficient of expansion of 6 (100% is a coefficient of expansion of 2; 200% is a coefficient of expansion of 3, etc.). Multiplication of the weight 15% by the coefficient of expansion of 500 (the coefficient expressed in cumulative percent) yields a result of 75% or 5.2% annually). If this is subtracted from the compound annual S&P return of 7.9%, the result is appreciation of 2.7% per annum for all other securities. Obviously, such a system is exceedingly crude. However, the energy weight is probably low and hence the estimate probably errs on the side of caution. In any event, the cursory data examined thus far does not yield a utility result that is inferior to the typical company.

The data for other utilities referenced is provided in the following passages commencing with Southern Company.

Southern Company

	Div Per Share	Payout Ratio	Price Range	P/E Ratio	Avg. Yield
1970	$ 1.22	67%	28 7/8 - 19	13.2	5.1%
1971	$ 1.26	71%	28 3/4 – 18 1/2	13.3	5.2%
1972	$ 1.30	69%	22 7/8 – 18 1/2	11.0	6.3%
1973	$ 1.34	68%	20 7/8 – 14 3/4	8.6	7.5%
1974	$ 1.40	99%	17 1/4 - 7 7/8	8.9	11.1%
1975	$ 1.40	62%	15 1/8 – 8 3/4	5.3	11.7%
1976	$ 1.43	87%	16 7/8 – 13 3/4	9.3	9.3%
1977	$ 1.48	75%	18 1/8 – 15 5/8	8.5	8.8%
1978	$ 1.54	106%	17 7/8 – 13 ¼	10.7	9.9%
1979	$ 1.54	102%	14 7/8 – 11	8.6	11.9%
1980	$ 1.56	68%	14 1/8 – 10 1/4	5.3	12.8%

If one purchased Southern company at the midpoint of its range in 1970 and sold at the midpoint of the trading range in 1980, and regularly reinvested dividends, the compound annual rate of return earned would be a remarkable 2.57%. Such a return is remarkable in view of the fact that dividend is far inferior to dividend growth at Florida Power and Light. In the case of Southern Company, dividends increased by roughly 2.5% per annum. The Florida Power and Light dividend growth rate was about 10% per annum, or well above the rate of inflation. Yet, the great equilibrating factor is dividend yield. At the time when Florida Power and Light shareholders would be reinvesting at a 6 plus % yield, Southern Company investors would be reinvesting at yields in excess of 11%. Southern Company experienced earnings declines in 1971, 1974, 1976 and 1978.

Another company that experienced earnings declines in 1971, 1975, 1978 and 1980 was Southern California Edison. The Southern California Edison data is presented below.

Southern California Edison

	Div Per Share	Payout Ratio	Price Range	P/E Ratio	Avg. Yield
1970	$ 1.48	55%	33-23	10.4	5.3%
1971	$ 1.50	61%	35 ½ - 25 ¼	12.3	4.9%
1972	$ 1.56	61%	31 7/8 – 23	10.8	5.7%
1973	$ 1.56	58%	28 ½ - 17 ½	8.5	6.8%
1974	$ 1.65	40%	19 7/8 – 14 5/8	4.2	9.6%
1975	$ 1.68	55%	21 ½ - 16 ¾	6.2	8.8%
1976	$ 1.68	45%	23 5/8 – 18 3/8	5.7	8.0%
1977	$ 1.92	49%	27 ¼ - 21 1/8	6.2	7.9%

1978	$ 2.24	64%	27 – 22 7/8	7.1	9.0%
1979	$ 2.54	56%	27 3/8 – 23 ½	4.5	10.0%
1980	$ 2.78	79%	27 ¾ - 10 1/4	6.9	11.6%

In contrast to the Florida Power and Light dividend growth rate of roughly 10% per annum, Southern California Edison experienced a dividend growth rate of 6.5% per annum during the period in question. Assuming purchase in 1970 at the midpoint trading range of that year and sale at the midpoint trading range in 1980, the compound annual rate of return experienced would be 6.5%. This is superior to either Southern Company or Florida Power and Light. The explanation for the superior performance is rather simple. The rate at which earnings were capitalized in 1970 (p/e ratio) was different for all three firms.

P/E in 1970 Annual Averages

Florida Power and Light	16.4x
Southern Company	13.2x
Southern California Edison	10.4x

The 1980 p/e ratios for the three firms were as follows:

Florida Power and Light	6.1x
Southern Company	5.3x
Southern California Edison	6.9x

Southern California Edison necessarily experienced the highest return sine it endured the least p/e multiple degradation. Data for Arizona Public Service, Middle South Utilities, Texas Utilities and Duke Power are contained in the Appendix. However, valuation results can be summarized in the accompanying tables.

P/E in 1970 Annual Averages

Arizona Public Service	11.6x
Middle South Utilities	14.6x
Texas Utilities	16.1x
Duke Energy	15.8

The 1980 p/e ratios for the three firms were as follows:

Arizona Public Service	6.2x
Middle South Utilities	6.1x
Texas Utilities	5.4x
Duke Power	5.4x

The averages for all seven firms in 1970 results in a p/e of 14.0x. The 1980 average is a p/e ratio of 5.9x. In 1970 the Federal funds rate was 7.17%. The Moody's AAA Corporate Bond yield was 8.0%. The ten-year US Treasury yield was 7.35% and the 20

year US Treasury yield was 6.87%. The yield curve was slightly inverted at the long maturity end of the spectrum.

In 1980 the Federal funds rate was 13.35%. The Moody's AAA Corporate Bond yield was 11.9%. The ten year US Treasury yield was 11.43%. The 20 year US Treasury yield was 11.36%. These were the required rate levels such that utilities could trade at an average p/e multiple of 5.9x and dividend yields that exceeded 11%. The multiple compression exerted upon other large capitalization firms was equally severe.

For instance, these are the 1970 average p/e ratios for selected large firms as posted in the Moody's Stock Handbook of that year.

JP Morgan	11.7x	Sears	21.3x
General Electric	21.4x	Colgate Palmolive	14.2x
Automatic Data Processing	69.9x	Coca Cola	30.5x
Shell Transport	12.2x	McDonald's	25.8x
National Semiconductor	48.9x	Exxon	10.5x
Mead	23.6x	Dow Chemical	15.2x
Loews	14.3x	Dow Jones	36.9x
Johnson and Johnson	32.5x	Dupont	16.5x
International Paper	18.5x	Phillip Morris	12.3x
JC Penny	21.7x	Anheuser Busch	24.0x

The following is a list of the average annual p/e ratios of the same companies for 1980 as these appear in the Moody's Stock Handbook of that year.

JP Morgan	5.2x	Sears	8.9x
General Electric	8.0x	Colgate Palmolive	6.0x
Automatic Data Processing	16.4x	Coca Cola	9.8x
Shell Transport	2.8x	McDonald's	8.0x
National Semiconductor	14.2x	Exxon	5.4x
Mead	5.2x	Dow Chemical	7.7x
Loews	4.4x	Dow Jones	12.9x
Johnson and Johnson	12.9x	Dupont	8.3x
International Paper	6.5x	Phillip Morris	8.4x
JC Penny	6.3x	Anheuser Busch	7.4x

It certainly would appear that p/e multiple compression was as severe in non-utility firms as in the case of utilities firms. However, the critical point is that extremely high bond yields were required to bring utility valuation to the low levels of 1980. Utilities did not prove to be any more sensitive to interest rate increases than any other type of securities, including the energy variety. Readers should take note of the p/e ratio compression exhibited by Shell Transport. During the 1970-1980 time period, Shell Transport earnings increased from $1.33 per share to $7.44 per share, or at a compound annual rate of 18.9%.

The p/e multiples of the seven utilities in question are now as follows, based upon forecasted 2006 earnings:

FPL Group	15.0x
Southern Company	15.4x
Edison Int'l	14.3x
Pinnacle West	12.9x
Entergy	13.7x
TXU	9.9x
Duke Energy	14.6
Average	**13.7**

The average p/e multiple is slightly below the 14.0x p/e recorded by the average for this group in 1970. However, the current Federal Funds rate is 2.85%. The Moody's AAA Corporate Bond yield is 5.90%. The ten-year treasury yield is currently 4.40%. The 20-year Treasury yield is 4.64%. Thus, the Federal Funds rate is 32 basis points lower than in 1970. The Moody's AAA Corporate Bond Yield is 210 basis points lower than 1970. The ten-year Treasury yield is 295 basis points lower than in 1970. The 20-year Treasury yield is 223 basis points lower than in 1970. The current utility p/e multiples appear to reflect an anxiety about future substantial increases in interest rates that have yet to be manifest. The 1970 utility p/e multiples appear to reflect no anxiety about high levels of interest rates that were already manifest. It seems that the 1970 situation is rather different from the 2005 situation.

IV – Future Possibilities

There are two critical dynamic factors with which the utility investor should be concerned. The first factor is obviously the future direction of interest rates. However, as noted previously, every investor should be concerned with the future direction of interest rates since no financial asset is immune to valuation degradation in high interest rate environments. The second factor is the recent repeal of the Public Utility Holding Company Act. As will be argued, these two seemingly diverse factors are not unrelated.

Let us first restate interest rate levels for 1970. The Federal Funds rate was 7.17%. The Moody's AAA Corporate bond yield was 8.0%. Let us use the Federal Funds rate as the proxy for the cost of short-term borrowing and the Moody's AAA Corporate Bond yield as the proxy for intermediate and long-term borrowing. These average rates had increased to a Federal Funds rate of 10.51% and an 8.6% Moody's AAA Corporate Bond yield in 1974. Data for the term structure of debt outstanding during this era is not very reliable. Let us

therefore assume that the term structure of the debt of that era was 50% short term and 50% long term. The increase in short-term rates was 334 basis points. The increase in long-term rates was only 60 basis points. The average increase in basis points was only 197 basis points.

The same methodology can be applied to interest rate levels in 1972 versus those of 1974. In 1972 the Federal Funds rate was 4.44%. The Moody's AAA Corporate Bond yield was 7.2%. The increases in basis points were therefore as follows:

607 basis points – short-term
140 basis points – long-term

Average = 374 basis points

As a matter of abstraction, it is fair to say that a borrower in 1974 with a term structure of 50% long-term debt and 50% short-term debt would pay 374 basis points more than a borrower with the same characteristics in 1972.

The worst case scenario impact upon the economy can be calculated. The total amount of credit market debt outstanding as computed by the Federal Reserve for the year 1974 was $2.409 trillion. Gross domestic product for 1974 was roughly $1.5 trillion. If every borrower needed to refinance the aggregate $2.409 trillion of debt in 1974, the cost of such borrowing would increase by 374 basis points. If this figure is then applied to the $2.409 trillion of aggregate debt, the resulting increased interest payment would be $90 billion, or 6% of GDP. This is a rather large figure. The actual figure would hot have been nearly as large since, as a practical matter, not all debt would have been required to be refinanced in 1974. However, the calculation is useful as an abstraction to understand the burden placed upon an economy by higher interest rates.

Let us therefore apply the same methodology to the current circumstance. The Federal Funds rate is now 3.85%. The Moody's AAA Corporate Bond yield is now 5.90%. Let us assume an increase in interest rates to the 1974 levels. Hence, the Federal Funds rate would increase by 666 basis points. The Moody's AAA Corporate Bond yield would increase by 270 basis points. The average is simply calculated as follows:

666 basis points – short-term
270 basis points – long-term

Average = 486 basis points.

Total credit market debt outstanding as computed by the Federal Reserve was $38.1 trillion as of the second quarter of 2005. The application of an increase of 486 b.p. to the credit market debt outstanding results in an additional interest payment amount of $1.783 trillion. US GDP is currently roughly $12.4 trillion. Hence, the additional interest payments would

represent 14.4% of GDP, or more than twice the burden upon the economy resulting from an equivalent level of interest rates in 1974.

Of course, interest rates have already increased since June 2004. At that time the Federal Funds rate was 1.04%. The Moody's AAA Corporate Bond yield was 5.6%. The Federal Funds rate has thus far increased by 281 basis points. The Moody's AAA Corporate Bond yield has increased by 30 basis points. The average increase, assuming a term structure of debt equally weighted between long and short term instruments, may be calculated simplistically in the following manner:

281 basis points – short-term
30 basis points – long-term

Average = 155 basis points.

This modest rate increase is a debt service burden of an incremental $590 billion relative to the $38.1 trillion of total credit market debt outstanding. It is equivalent to 4.7% of current GDP or an amount almost equal to the 6% figure obtained in 1974.

This is probably the reason why the bond market has reacted with relative indifference to significant increases in oil prices in the past several months as well as the largest increases in the PPI and CPI in many years. The following table illustrates this phenomenon.

Measures of Inflation and Long-Term bond Yields
July-September 2005

	CPI	PPI	10-yr Treasury	20-yr Treasury
July '05	0.5%	1.0%	4.18%	4.48%
August '05	0.5%	0.6%	4.26%	4.53%
September '05	1.2%	1.9%	4.20%	4.51%

The 10-year treasury is currently at a 4.40% yield. The 20-year treasury is currently at a 4.64% yield. The 10-year treasury yield was 4.23% in December 2004 and 4.5% in March 2005. The 20-year treasury yield was 4.88% in December 2004. This yield increased slightly to 4.89% in March 2005. The bond market participants realize the incremental burden placed upon the economy by even the modest increases in interest rates thus far imposed.

Mere elementary algebra is required to calculate the rate level that would impose the 6% incremental debt service burden upon the economy experienced in 1974. Let us hold the long interest rate proxy constant. Thus, the unknown factor becomes the Federal Funds rate which has been utilized thus far as the short-term rate proxy. We seek a number equal to 1.3% of current GDP (i.e. theoretical 6% debt service burden minus the already existing incremental 4.7% debt service burden). This is $161 billion or 1.3% of the $12.4 trillion US GDP. This figure of $161 billion is equal to 0.42% of the $38.1 trillion credit market debt outstanding. The problem is therefore to calculate the required Federal Funds level

given constant long-term interest rates. The current level of interest rates create a $590 billion incremental debt service burden above the existing burden in June 2004. The 6% debt service burden must equal the sum of $161 billion and $590 billion, or $751 billion. This is equivalent to 1.97% of total credit market debt outstanding. Given an equal division of term structure between long and short term rates and accepting the long rate increase is fixed at 30 basis points, the required equation is:

$.5x + (0.3).5 = 1.97$

where x is the required increase in Federal Funds rate above the 1.04% level of June 2004. Multiplication of terms and subtraction of equivalent amounts from both sides of the equation results in

$.5x = 1.82$

$x = 3.64$

Therefore, the Federal funds rate would need to increase 364 points above 1.04%, or attain the level of 4.68%. On November 1, the Federal Reserve is virtually certain to engineer the Federal Funds rate to the 4.0% level. Hence, the current rather low level of rates is perilously close to the creation of the debt service burden that existed at much higher absolute levels of rates in 1974.

These passages are offered to the reader not as forecast of the future direction of interest rates but merely as an explanation of the apparent indifference of bond market participants to evidence of inflation that has recently come to light. The interest burden upon the US economy must, from an arithmetical perspective, weigh very heavily although the absolute level of rates is low. Perhaps for this reason has the burden been so gently placed upon the economy in measures of 25 basis points per application.

The post World War II average Moody's AAA Corporate Bond yield is 7.5%. The inflation rate for the same time period manifests an average of 4% per annum. Thus, the real interest rate (AAA Bond Yield minus inflation) equals 3.5%. since the Moody's AAA Corporate Bond yield stands at 5.9%, it is apparent that bond market participants are either anticipating lower than average inflation rates or are willing to accept a real interest rate lower than the historical average. If the inflation rate experienced in the US for the third quarter continues at the current rate, the annual rate of inflation would be 9.16%. The low long an intermediate term interest rates appear more reasonable if one accepts the view that the recent levels of short-term rates, historically modest as these may be, are in reality a very heavy burden upon an indebted society.

Let us next assume that long-term interest rates were to remain at or near current levels. In August 2005, the US Congress repealed the Public Utility Holding Company Act of 1935. It is now possible to merge utilities that do not have contiguous service territories. It is

also now possible for non-utility companies to purchase utility companies. Let us now consider the position from the perspective of a well capitalized non-utility firm.

The average utility trades at a price-to-book ratio of roughly 1.4x. The average return on equity for a utility is perhaps 10.5%. At a price to book value ratio of 1.4x, this equals an actual earnings yield of 7.5% (e.g. 10.5% divided by 1.4). This also corresponds to the average p/e calculated for the seven representative utilities in Section II of this paper. It will be recalled that this figure was computed to be 13.7x. The translation of this figure to an earnings yield merely requires the reciprocal of the number in question or 1/13.7 = 7.30%. It must be observed that this is an after tax return to the buyer.

A well capitalized company such as Berkshire Hathaway or General Electric can certainly borrow long-term funds at no more than 5.9% (Moody's AAA Corporate Bond yield) or perhaps even less. This is a pre-tax cost of debt capital. If the number were to be translated to an after tax cost of debt, assuming a 35% tax rate, the "true" cost of debt capital would be (1-tax rate) x (pre-tax debt cost) or 3.84%. Thus, a well capitalized company can borrow at 3.84% and invest at 7.3%. This represents a genuine arbitrage opportunity made possible by the recent repeal of the Public Utility Holding Company Act.

There are only two possible eventualities that would inhibit the eventual execution of this "arbitrage". The first would be the reimposition of the Public Utility Holding Company Act. There is no large constituency for such action. Therefore, the second possibility must be considered. That is to say that the utility price must rise to the level that would make the arbitrage impossible. This is obviously an earnings yield of 3.84%. The reciprocal of this number is the p/e ratio that corresponds to this earnings yield. The reciprocal would be 1/.0384, or a p/e ratio of 26.04x.

It is no doubt difficult to believe that utilities could ever trade at such p/e ratios. It is plausible that a utility could trade at a p/e ratio of perhaps 16-17x. Thus, using the midpoint of 16.5x, an acquirer could pay a very substantial (20%) premium above the current utility p/e ratio of 13.7x for the sample group used in this paper.

The logical consequence of the current level of utility valuations is a series of acquisition valuations. The conditions necessary for such a phenomenon have only recently been established. It is merely another form of the so called "carry trade". Paradoxically, as the Federal Reserve has properly eliminated the steep slope of the yield curve in order to inhibit "carry trade" transactions, a much larger and richer "carry trade" opportunity has just been established. This form of "carry trade" has unwittingly been made possible by members of the US Congress. It merely awaits discovery by members of the financial community.

Appendix I

Utilities Investment Logic in History

*I – **Historical Prelude***

In the month of October, 1878, utility securities listed on the New York and London Stock exchanges declined by over 12% within several days. The ostensible reason was several interviews granted by Thomas A. Edison to reporters for the New York Sun, the New York Herald and the New York Tribune. Edison thus announced to the world that he was then engaged in a venture to develop the electric light bulb. [*]

Edison had secured $50,000 of venture capital financing on October 15, 1878 from a consortium composed of, among others, Vanderbilt (New York Central Railroad) and several senior executives of Western Union as well as a partner of JP Morgan representing the Morgan interests. Edison had filed an electric light bulb patent on October 5, 1878.

Since Edison was not a theoretical scientist like Faraday or Hertz or Maxwell, he worked by trial and error. As is necessary with such a methodology, Edison was a meticulous recorder of notes. Edison's notebooks still exist and it is known that the first entry concerning electric light bulbs was on September 11, 1878. The notes reveal that all that Edison knew about electric light bulbs by October 4, 1878 was the importance of creating a vacuum for the filament and that he had no means of measuring the resistances of the various incandescing materials.

It is now known that Edison did not solve the filament problem until October 21, 1879. The patent for the successful carbon filament lamp was not filed until November 1, 1879. The patent was granted on January 27, 1880 as US Patent no. 223898.

One might say that in a sense the markets were remarkably efficient insofar as it seems that the Edison success was immediately and quite properly reflected in share prices. The resultant market panic was sufficiently serious that the British parliament actually convened a Parliamentary Commission of Inquiry into this matter. If the electric light were a success, it would evidently make obsolete the then common technology of gas light. Therefore, any firms associated with the gas business would ultimately become insolvent.

The consensus opinion of the expert scientists called before the committee to testify was that the Edison project could not possibly succeed. One of the experts testified that: these ideas "were good enough for our transatlantic friends…but unworthy of the attention of practical and scientific men".[**] Among the luminaries that doubted the practicality or even the theoretical possibility of electric light was professor Sylvanus P. Thompson. Professor

[*] The primary source for Edison's activities is: Mathew Josephson: Edison (London: Eyre and Spottiswoode Publishers Ltd. 1961) p. 185-227

[**] Arthur C. Clarke: Greetings, Carbon-Based Bipeds (London: Harper Collins 1999)

Thompson stated that such theories betrayed "the most airy ignorance of the fundamental principles of both electricity and dynamics". [***]

Professor Thompson is the author of "Calculus Made Easy". This is one of the best calculus textbooks ever written and the only calculus textbook to remain in print for nearly a century. The first edition of this book was published in 1910. Thompson was the President of the Institution of Electrical Engineers and first President of the London Roentgen Society. It is perhaps needless to say that the British Parliamentary Committee concluded that electrical lighting was no threat to the gas industry.

One might say that in a curious sense the British Parliamentary Committee and its expert witnesses were correct. Although electric light did most certainly displace gas light, the gas industry is far larger and more prosperous than at any point in 1878.

The financial markets completely failed to anticipate the growth of demand of gas for heating, cooking and many various industrial applications. In fact, the gas industry is far more profitable than the electric light bulb industry. The Western Union and New York Central Railroad owned by the original Edison venture investors have long since become insolvent. The newspapers that carried the Edison interviews in 1878 such as the New York Sun, the New York Herald and the New York Tribune have long ceased to exist although the name of the New York Sun was resurrected some years ago by a new newspaper venture.

The reason all of these obscure facts are of interest is with regard to the question of investment logic. If one had seen the future with clarity in 1878, how could such a prediction be stated so that it would appear to be well reasoned and credible?

*II – **Investment Logic***

Facts are, of course, not the problem since one now operates with the benefit of more than one century of ex post facto knowledge. The difficulty is plausibility within the historical context of 1878. The British Parliamentary Committee of Inquiry might have written a report more or less along the following lines:

> Despite the vigorous disagreement of the leading scientist called to testify before the committee, this committee concludes that if Mr. Edison can successfully solve the filament problem, the current measurement problem, the subdivision of current problem as well as the vacuum problem, he is then likely to produce an electric light bulb. If an electric light bulb industry were then to develop that could produce light bulbs at a sufficiently low cost to enable the impoverished masses to purchase these bulbs then this might encourage the

[***] Josephson, op. cit. p 186

> development of an electric power industry. Of course, such an industry would need to raise unprecedented amounts of capital to construct dynamos. The industry would also need to obtain vast amounts of right of way through populated areas. The dynamos would require a low cost fuel source so that the power produced could be afforded by the customers. If all of these elements are properly set in place, the gas light industry is likely to be displaced by the electric light industry. Of course, such massive construction projects as envisaged would require one or two generations to complete. Consequently, the threat to the gas light industry is certainly not immediate.

Nevertheless, this committee further concludes that electric power is certainly no threat to the gas industry since ultimately the demand for gas used for heating, cooking and a vast variety of industrial uses will be far in excess of anything currently required for the purposes of gas lighting. Indeed, this committee does envisage the day when a gas pipeline will be used to transmit fuel to a dynamo producing current for the purposes of electric lighting. Hence, the fears of the frenzied traders on the London and New York exchanges are entirely without foundation. An electric power industry will actually stimulate the demand for gas.

The members of the committee also venture to make another observation although it is beyond the scope of the present inquiry. The honorable gentleman that own shares of Western Union might do well to consider the possible threat to the telegraph from the potential development of a device known as the harmonic or speaking telegraph. It will be recalled that the Prime Minister, Mr. Gladstone, as well as the Prince of Wales were invited to speak on such a device at an exhibition held in London on March 15, 1879.

In logic, such statements are known as conditional conjunctives. It is evident that such assertions are most complex since these involve a plenitude of dependent causal relationships. Generally speaking, humans do not choose to express themselves in this manner. Causality with regard to many things is constantly discussed. Yet, it is almost always linear, bimodal causality. In other words A causes B. If A does not exist, then B cannot happen. Thus, with reference to the subject presently under consideration, if the electric light is successful, the gas light industry must be a failed investment. In fact, if consultants and analysts existed in 1878 as these exist currently, the correlation between electric shares and gas shares would have been precisely calculated. Undoubtedly, a vast series of trades would have been devised to exploit these statistical relationships. Fortunately, the concept of correlation was not developed until 1889 (when it was then known as the index of co-relation)[2].

[2] Stephen M. Stigler: Statistics On The Table The History of Statistical Concepts and Methods (Cambridge, Massachusetts, Harvard University Press) p.182

The problem with social science or even behavioral or biological science is that most causality is non-linear and multi-casual. Relationships between variables alter over time. There are very few constants, unlike in physics and chemistry.

The problem placed before the British Parliamentary Committee of Inquiry was binary. The problem was either to accept or reject the assertion that the gas industry will be threatened by the electric light industry. Will electric light replace gas light? The problem cannot be solved in the manner that the question is posed since the gas light industry was actually the gas industry. The problem begins with improper nomenclature. The problem is no more solvable in this form then if one were to consider a problem in astrophysics given the assumption that the sun revolves around the earth. Thus, if one uses binary investment logic, one ignores the reality of multiple causation and any discussion or consideration of an issue is likely to improperly evaluated. Investment logic is far more than acceptance or rejection of an investment hypothesis.

*III – **How October 1878 Could Have been Prevented Using Binary Logic***

As stated previously, binary logic is completely inappropriate in social science applications, since almost all phenomena to be studied are multi-causal. Prior to October 1878, Edison had filed 116 patent applications. All of these pertain to telegraphy. The demonstration of the phonograph, or sound playing machine, did not occur until Nov 39, 1878. Among the patents were several for so called “printing telegraphs.” These were a major improvement in telegraphy. Edison himself had been a telegraph operator. A telegraph operator prior to the Edison invention of the primary telegraph needed to write down all of the dot and dash sounds generated by the telegraph and then generated by the telegraph and then translate the Morse Code (dots and dashes) into a comprehensible language. The information frequently was generated faster than a telegraph operator could write, given the existence of many random distractions. The printing telegraph was merely a paper tape that would record with perforations on the paper the movement of the telegraph needle. Thus, the accuracy of telegraphy improved greatly since the operator could now translate Morse Code at a more leisurely pace from an accurate paper tape transcription message.

Unfortunately for the future of financial markets, the paper tape printing telegraph is the basis for the original ticker tape or quotation machine. The Universal Stock Ticker, as Edison called his device was invented in 1870. Thus, everyone engaged in stock trading in New York and London knew of Thomas Edison.

One can readily imagine such people reasoning that a man who can invent a stock quotation machine can do just about anything. If Edison had merely confined his interest to

matters such as electro-magnetic railway engines, phonographs, magnetic ore separators, galvanic batteries, typewriters, primitive multiplexers, electric meters, and the expandable pulley, it's most likely that no one in New York or London Financial circles would ever have heard of this fellow. All that was necessary was that Edison invent something useful instead of the Universal Stock Ticker. In that case, his credibility would have been treated with the customary skepticism with which financial experts treat new ideas. Thus, the ability of Edison to invent the incandescent light bulb would have been doubted. Consequently, the events of October 1878 would not have occurred.

Appendix II

Historical Utility Data

Source: Moody's

Arizona Public Service

	Div Per Share	Payout Ratio	Price Range	P/E Ratio	Avg. Yield
1970	$ 1.08	62%	23 1/2 – 16 5/8	11.6	5.4%
1971	$ 1.08	62%	25 – 17 5/8	12.2	5.1%
1972	$ 1.12	49%	25 ¼ – 17 3/8	9.3	5.3%
1973	$ 1.21	46%	24 7/8 – 16 5/8	7.9	5.8%
1974	$ 1.36	58%	19 3/4 – 11 7/8	6.6	8.8%
1975	$ 1.36	52%	16 3/8 – 11 7/8	5.4	9.6%
1976	$ 1.39	56%	19 7/8 – 15	7.1	8.0%
1977	$ 1.53	51%	21 3/8 – 18 1/8	6.5	7.7%
1978	$ 1.73	55%	21 5/8 – 18 3/4	6.4	8.6%
1979	$ 1.94	67%	21 3/8 – 16 7/8	6.6	10.1%
1980	$ 2.06	75%	19 5/8 – 14 5/8	6.2	12.0%

Middle South Utilities

	Div Per Share	Payout Ratio	Price Range	P/E Ratio	Avg. Yield
1970	$ 0.96	61%	27 5/8 – 18 5/8	14.6	4.2%
1971	$ 1.02	60%	28 5/8 – 21 3/4	15.0	4.0%
1972	$ 1.06	54%	28 ¾ - 19 3/8	12.2	4.4%
1973	$ 1.13	54%	27 ½ - 14	9.9	5.5%
1974	$ 1.22	55%	18 – 9 1/8	6.1	9.0%
1975	$ 1.26	74%	16 3/8 – 12 3/8	8.5	8.8%
1976	$ 1.34	74%	17 3/8 – 13 5/8	8.5	86%
1977	$ 1.38	63%	17 7/8 – 15 3/8	7.6	8.3%
1978	$ 1.44	59%	17 3/8 – 14 1/4	6.4	9.1%
1979	$ 1.54	72%	16 3/8 – 12 1/4	6.7	10.8%
1980	$ 1.58	79%	14 ¼ - 10 1/4	6.1	12.9%

Source: Moody's

Texas Utilities

	Div Per Share	Payout Ratio	Price Range	P/E Ratio	Avg. Yield
1970	$ 0.89	53%	30 7/8 - 23	16.1	3.3%
1971	$ 0.95	54%	32 3/8 – 27 1/2	17.2	3.2%
1972	$ 0.99	51%	36 – 25 3/4	15.8	3.2%
1973	$ 1.03	51%	34 ½ - 20 1/2	13.7	3.8%
1974	$ 1.09	50%	25 – 15 1/4	9.2	5.4%
1975	$ 1.22	60%	25 ¼ - 17	10.4	5.8%
1976	$ 1.30	57%	22 ¼ - 17	8.6	6.6%
1977	$ 1.38	58%	23 3/8 – 18 7/8	8.8	6.5%
1978	$ 1.49	57%	22 ¼ - 18	7.9	7.4%
1979	$ 1.61	66%	20 1/8 – 16 3/4	7.5	8.7%
1980	$ 1.73	54%	19 3/8 – 14 7/8	5.4	10.1%

Duke Power

	Div Per Share	Payout Ratio	Price Range	P/E Ratio	Avg. Yield
1970	$ 1.40	89%	29 ½ - 201/8	15.8	5.6%
1971	$ 1.40	74%	27 5/8 – 20 3/4	12.9	5.8%
1972	$ 1 40	83%	25 1/8 - 21	13.6	6.1%
1973	$ 1.40	75%	23 ¼ - 16	10.5	7.1%
1974	$ 1.40	78%	20 ¾ -10	8.5	9.1%
1975	$ 1.40	76%	19 5/8 – 10 3/4	8.3	9.2%
1976	$ 1.53	64%	23 3/8 - 16 5/8	8.3	7.7%
1977	$ 1.63	68%	23 ½ - 19 7/8	9.0	7.65%
1978	$ 1.74	67%	22 1/8 – 18 1/8	7.7	8.6%
1979	$ 1.83	64%	20 5/8 – 16 1/4	6.4	9.9%
1980	$ 1.95	63%	19 1/4 – 14 1/8	5.4	11.7%

