



JUNIOR OIL AND GAS FIRMS COST OF EQUITY APPROXIMATION: A CONTINUATION OF THE PRAGMATIC USE OF THE SHARPE RATIO EMPLOYED JUNE 2008

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OVERVIEW

The following serves as an update upon the previous “*A Pragmatic Method of Approximating the Minimum Cost of Equity for Junior Oil and Gas Firms During Periods of Commodity Price Uncertainty*”. Methods presented then are no longer effectual in these dramatically changed economic times. This paper serves as a discussion as to the reasons why.

INTRODUCTION

In the past three months there has been a substantial and almost instantaneous downturn in the world economy. Since June 30, 2008 there has been at least a 30% decline in most every major North American stock market with the one exception of the very narrowly defined DJI Index, which is down 22%:

% decline in major Indexes June 30, 2008 to Nov 28, 2008	
S&P 500	-30.0%
NASDAQ Composite	-33.0%
Dow Jones Industrials	-22.2%
Wilshire 5000	-31.6%
S&P/TSX	-35.9%

INCREASED MARKET VOLATILITY

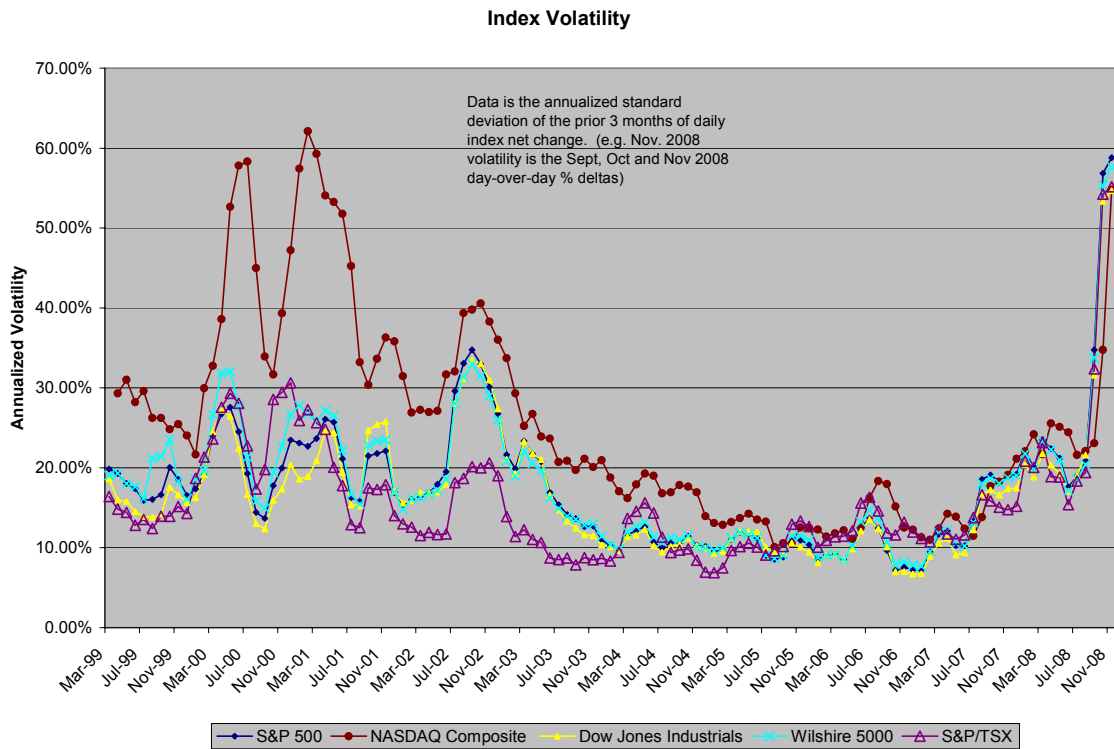
Moreover, the annualized volatility for each of these indexes (measured for the 12 months ending the last trading day of November) is now almost unprecedented compared with recent history:



Annualized Volatility (measured by trading day) for the One Year Ended:

	Nov-08	Nov-07	Nov-06	Nov-05	Nov-04	Nov-03	Nov-02	Nov-01	Nov-00
S&P 500	38.15%	15.02%	9.89%	10.23%	10.93%	17.32%	25.44%	21.85%	20.87%
NASDAQ Composite	38.02%	16.32%	13.90%	12.45%	16.98%	22.60%	34.08%	45.73%	44.65%
Dow Jones Industrials	35.54%	13.68%	9.76%	10.27%	10.68%	16.83%	24.94%	21.48%	19.63%
Wilshire 5000	37.51%	14.83%	10.46%	10.44%	11.24%	16.73%	24.43%	23.42%	23.29%
S&P/TSX	35.94%	13.48%	12.81%	10.44%	11.14%	9.92%	16.37%	20.11%	25.18%

To better understand the magnitude of the September to November 2008 market changes, we will look at the history of index volatility measured over a rolling 3 month period. The following graph clearly shows that market volatility has almost never been as high (almost a 60% annualized rate) as in the three months ending November 2008. The one exception was the 2000 to 2001 Dot.Com fiasco which specifically impacted the NASDAQ and caused the period ending February 2001 to exceed 60%.





IMPACT UPON COST OF EQUITY FOR JUNIOR O&G EXPLORATION FIRMS

While the recent sub-prime mortgage debacle and subsequent commercial credit crunch had been an economic disaster of epic proportions, it does also afford us a very unique opportunity to test ‘cost-of-equity’ market reaction. Specifically, for the 60 month period ending June 30, 2008 the Accession Capital paper entitled “*A Pragmatic Method of Approximating the Minimum Cost of Equity for Junior Oil and Gas Firms During Periods of Commodity Price Uncertainty*” came to the conclusion that most of the 50 TSX-V firms examined had failed to meet a minimum cost of equity expectation. This conclusion was determined on a post-hoc unit-of-risk basis. The Sharpe Ratio was employed to examine what the market index¹ had returned per unit of volatility. This was then compared to the historic volatility of the 50 subject firms to determine how many of these had met or exceeded this return-per-standard-deviation index benchmark. Only six had.

Now, just five short months later the world of commerce is a much different place. The NYMEX near-term crude oil futures, which had closed at an all-time high of \$145.18 on July 14, 2008 finished November at \$54.43 and has, at of this writing, dropped as low as \$40.81 in December. The June to November month-end decline in the S&P/TSX Capped Energy Index equates to a drop of 45%.

The sample firms referenced in “*A Pragmatic Method ...*” have suffered share price declines far exceeding those of any index. Of the original fifty, two have since been privatized and one has not traded at all since June 30th. Forty-six have incurred share price declines that have averaged almost 73% in the intervening 5 months. Only one has experienced share appreciation since June 30, 2008 (Tanganika Oil Co.).

¹ The S&P/TSX index was employed as all the Oil & Gas [O&G] firms were Canadian juniors



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	Root Ticker	Company Name	% Change in Stock Price June 30/08 to Nov 30/08
1	AGP	Anglo Potash Ltd.	N/A
2	AOI	Africa Oil Corp	-58.64%
3	ARN	Arcan Resources Ltd.	-74.83%
4	BFR	Buffalo Resources Corp	-62.99%
5	BUK	Bridge Resources Corp	-65.41%
6	CE	Canada Energy Partners Inc.	-58.75%
7	CEN	Coastal Energy Company	-52.62%
8	CHQ	Challenger Energy Corp.	-69.57%
9	CKK	Cordy Oilfield Services Inc.	-79.73%
10	CLN	Culane Energy Corp	-81.86%
11	CNS	Canoro Resources Ltd.	-80.58%
12	CXZ	Canext Energy Ltd	-68.00%
13	CYR	Cirrus Energy Corporation	-80.42%
14	DEJ	Dejour Enterprises Ltd.	-72.78%
15	ENG	Energulf Resources Inc.	-92.20%
16	EUG	Eurogas Corporation	-78.46%
17	FO	Falcon Oil and Gas Ltd.	-81.58%
18	GBE	Grand Banks Energy Corp	N/A
19	GNO	Genoil Inc.	-37.21%
20	GSA	Groundstar Resources Limited	-83.33%
21	IAE	Ithaca Energy Inc	-88.32%
22	KDK	Kodiak Energy Inc.	-72.00%
23	LEY	Loon Energy Inc.	-61.67%
24	MCF	March Resources Corp.	-88.89%
25	MMT	Mart Resources Inc.	-88.14%
26	MVN	Madalena Ventures Inc	-80.77%
27	NKW	Naikun Wind Energy Group Inc.	-72.11%
28	NRS	Norwood Resources Ltd.	-88.46%
29	OEX	Orleans Energy Ltd. (now TSX)	-49.62%
30	ORC	Orca Exploration Group	N/A
31	OYL	CGX Energy Inc.	-85.07%
32	PEF	Petroflow Energy Ltd.	-57.33%
33	POE	Pan Orient Energy Corp	-60.78%
34	PRD	Pacific Roderia Energy Inc.	-57.45%
35	RYD	Ryland Oil Corporation	-84.88%
36	SCS	Second Wave Petroleum Ltd.	-85.00%
37	SE	Stratic Energy Corporation	-76.47%
38	SLG	Sterling Resources Ltd.	-85.95%
39	SOR	Solana Resources Ltd.	-52.99%
40	SQZ	Serica Energy PLC	-60.99%
41	STP	Southern Pacific Resources Corp.	-85.71%
42	TGE	TG World Energy Corp.	-80.39%
43	TTR	Terra Energy Corp	-38.10%
44	TWO	Twoco Petroleums Ltd.	-63.49%



45	TYK	Tanganyika Oil Co. (now TSX)	8.91%
46	WSR	WSR Gold Inc.	-95.38%
47	WX	Wrangler West Energy Corp.	-61.90%
48	WZR	Westernzagros Resrouces Ltd	-75.50%
49	XE	Xemplar Energy Corp	-73.61%
50	XEL	Xcite Energy Limited	-93.64%
Average of Decliners			-72.69%
Average of Gainers			8.91%

In light of such economic turmoil, two questions should be asked:

1. Could the same unit-of-risk procedures be applied now to determine a minimum cost of equity measure? And, if so, how has our sample of the fifty Junior Oil and Gas (O&G) firms fared?
2. Is it even reasonable to expect that traditional cost-of-equity measures will apply during times of global market meltdowns?

Traditionally, cost-of-equity measures have been long-termed. This is because most securities have indefinite life spans – and the assets those firms invest in often have thirty, forty or fifty-year economic lives. Therefore, in order to correctly match the expected risk yield curve with the earnings stream, one must use a long-term return-on-equity perspective. The Market Risk Premium (MRP) commonly applied in the Capital Asset Pricing Model (CAPM), for example, is usually representative of a period of at least fifty years and often as long as eighty-two years. But do investors return expectations differ in times of very high market volatility?

In the June 2008 Accession paper the historic Sharpe Ratio price of risk was based upon a 60-month average return and it was argued that this was a good benchmark with which to set the cost of equity minimum standards for junior exploratory oil and gas firms. These firms are unique in that their business cycle is generally shorter than five years. In the



event that they find a major reserve and evolve into a consistent producer, they then cease to qualify as pure exploration firms.

As at June 30, 2008 the 60 month Sharpe Ratio on the S&P/TSX index was 0.9815. That is, for every one percent of volatility in the Index, there was 0.98% return in the market risk premium - almost a one-to-one ratio. However, those 60 preceding months were comparatively uneventful. They certainly did not reflect a financial crisis of the magnitude subsequently incurred in the latter half of 2008.

QUESTION ONE: The answer to the first question above becomes an emphatic NO. This is because, for the sixty months proceeding December 2008, the Sharpe Ratio turns negative. The ratio is dependent upon the excess the Index returns over the risk-free rate of interest (the MRP). The S&P/TSX generated a total effective annual yield of approximately 2.4% for the period in question² whereas the average long-term Government of Canada bond rate was approximately 4.5% over that period. So our ex-post measure of unit-risk becomes rhetorical in light of this – no investor would ever advance any equity funds whatsoever with the expectation that an equal investment in risk-free bonds would yield a greater return.

We had been using the historic 60 month Sharpe Ratio as a proxy for investors' future expectations on the Index as a whole. To the end of June 2008 this technique had worked fine and it was reasonable to presume that 0.9815 previously measured return/risk matrix would continue into the future. Then the Index dropped 36% in five months and our previous expectations of market performance became meaningless³. Such is the foible of

² Of course, for the 55 months prior to July 2008 the annual yield on the Index was approximately 13%, so it was only the final 5 months to the end of November 2008 that obliterated most of the earlier gains.

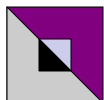
³ It would be possible, of course, to select another historic period to represent future expectations of the Sharpe Ratio. For example, rather than a 60 month measure, perhaps a 120 month or 240 ... or even make the same ultra-long-term assumptions the CAPM does. The problem with this approach, particularly if the results are to be used in litigation, is that one can quickly lose objectivity and be unable to defend against an accusation of bias in the ultimate selection of the period (i.e. data cherry picking).



not actually knowing the future, but being in the business of having to predict it all the same. Now what?

QUESTION TWO: The answer to question two is undoubtedly a much bigger scope than can be addressed here. However, without actually providing any credible empirical evidence to support this supposition; it is not reasonable to expect that the average minority interest investor⁴ is going to have the same return expectations during times of 60% market volatility as compared with more normal times of 20% volatility. It will be instructive, just the same, to examine an updated table of the “50 Largest Oil and Gas Firms Trading on Toronto Venture Exchange in June 2008” presented in the earlier Accession paper (pg. 5 & 6):

⁴ An even more pertinent question to the professional valuator is what the cost of capital expectations will be for the en bloc investor. The issue revolves around how long the shock of the market downturn is expected to last and the predicted rate of recovery.



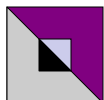
50 O&G Firms that were trading on Toronto Venture Exchange in June 2008

60 MONTH DATA

36 MONTH DATA

Compiled for the period ending November 30, 2008

Root Ticker	Company Name	Equity Market Cap as at Oct 31, 2008 (per TSX in millions C\$)	Max. # of data months	Annualized Yield* in that Period	Beta: 60 month w S&P/TSX Index	R ² : 60 month w S&P/TSX Index	Volatility: Monthly standard deviation % over 60 months	Beta: 36 month w S&P/TSX Index	R ² : 36 month w S&P/TSX Index	Volatility: Monthly standard deviation % over 36 months	
1	AGP	Anglo Potash Ltd.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
2	AOI	Africa Oil Corp	\$ 63.3	60	21.7%	1.396	0.117	17.97%	1.548	0.218	16.71%
3	ARN	Arcan Resources Ltd.	\$ 38.6	37	-51.7%	N/A	N/A	N/A	2.217	0.284	20.99%
4	BFR	Buffalo Resources Corp	\$ 41.4	60	-4.8%	1.051	0.043	22.48%	1.946	0.452	14.58%
5	BUK	Bridge Resources Corp	\$ 71.4	60	33.8%	2.317	0.065	40.08%	1.371	0.178	16.40%
6	CE	Canada Energy Partners Inc.	\$ 47.4	24	-19.5%	N/A	N/A	N/A	N/A	N/A	N/A
7	CEN	Coastal Energy Company	\$ 103.8	39	20.9%	N/A	N/A	N/A	-1.362	0.009	72.78%
8	CHQ	Challenger Energy Corp.	\$ 80.7	36	-9.8%	N/A	N/A	N/A	0.788	0.023	26.33%
9	CKK	Cordy Oilfield Services Inc.	\$ 20.9	60	6.5%	8.353	0.041	181.71%	1.990	0.310	18.01%
10	CLN	Culane Energy Corp	\$ 48.9	60	17.6%	2.038	0.202	19.92%	2.368	0.320	21.10%
11	CNS	Canoro Resources Ltd.	\$ 51.1	60	-21.9%	2.031	0.121	25.67%	1.811	0.150	23.56%
12	CXZ	Canext Energy Ltd	\$ 33.6	30	-41.3%	N/A	N/A	N/A	N/A	N/A	N/A
13	CYR	Cirrus Energy Corporation	\$ 130.3	44	4.6%	N/A	N/A	N/A	2.009	0.280	19.12%
14	DEJ	Dejour Enterprises Ltd.	\$ 38.9	60	12.1%	2.804	0.283	23.19%	2.821	0.501	20.07%
15	ENG	Energulf Resources Inc.	\$ 13.1	60	-12.0%	1.710	0.032	41.71%	0.285	0.002	31.28%
16	EUG	Eurogas Corporation	\$ 87.2	60	-16.0%	1.891	0.129	23.16%	1.600	0.273	15.44%
17	FO	Falcon Oil and Gas Ltd.	\$ 172.6	60	5.0%	2.661	0.134	32.02%	3.614	0.271	34.96%
18	GBE	Grand Banks Energy Corp	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19	GNO	Genoil Inc.	\$ 42.7	60	8.6%	0.500	0.006	28.67%	0.412	0.005	30.60%
20	GSA	Groundstar Resources Limited	\$ 13.0	60	-14.2%	0.987	0.023	28.71%	0.402	0.005	30.07%
21	IAE	Ithaca Energy Inc	\$ 73.4	30	-48.1%	N/A	N/A	N/A	N/A	N/A	N/A
22	KDK	Kodiak Energy Inc.	\$ 50.4	10	-78.3%	N/A	N/A	N/A	N/A	N/A	N/A
23	LEY	Loon Energy Inc.	\$ 20.0	60	27.4%	1.556	0.090	22.83%	1.389	0.158	17.62%
24	MCF	March Resources Corp.	\$ 2.2	60	-41.0%	3.062	0.058	56.06%	2.249	0.160	28.33%
25	MMT	Mart Resources Inc.	\$ 23.8	60	-19.2%	2.329	0.174	24.54%	2.019	0.167	24.90%
26	MVN	Madalena Ventures Inc	\$ 12.4	22	-70.4%	N/A	N/A	N/A	N/A	N/A	N/A
27	NKW	Naikun Wind Energy Group Inc.	\$ 15.7	60	35.3%	2.871	0.115	37.28%	2.483	0.098	40.05%
28	NRS	Norwood Resources Ltd.	\$ 13.0	60	-15.3%	3.464	0.171	36.86%	3.646	0.178	43.55%
29	OEX	Orleans Energy Ltd. (now TSX)	\$ 122.2	47	-7.0%	N/A	N/A	N/A	1.137	0.176	13.65%
30	ORC	Orca Exploration Group	\$ 86.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A



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31	OYL	CGX Energy Inc.	\$	59.3	60	-9.3%	2.584	0.171	27.50%	3.182	0.271	30.79%	
32	PEF	Petroflow Energy Ltd.	\$	141.0	60	75.8%	2.259	0.048	45.11%	2.398	0.182	28.34%	
33	POE	Pan Orient Energy Corp	\$	199.4	60	69.4%	-0.206	0.000	79.79%	2.237	0.257	22.25%	
34	PRD	Pacific Roderer Energy Inc.	\$	27.4	60	-8.5%	1.962	0.098	27.48%	2.391	0.236	24.80%	
35	RYD	Ryland Oil Corporation	\$	61.5	60	66.9%	2.629	0.040	57.99%	4.689	0.152	60.69%	
36	SCS	Second Wave Petroleum Ltd.	\$	27.1	47	-59.4%	N/A	N/A	N/A	1.583	0.085	27.30%	
37	SE	Stratic Energy Corporation	\$	80.4	60	-12.2%	2.026	0.201	19.89%	1.871	0.325	16.53%	
38	SLG	Sterling Resources Ltd.	\$	102.1	60	-0.5%	2.094	0.176	21.96%	2.226	0.275	21.38%	
39	SOR	Solana Resources Ltd.	\$	328.7	60	2.2%	1.738	0.124	21.70%	1.584	0.159	20.03%	
40	SQZ	Serica Energy PLC	\$	144.7	60	-3.6%	1.692	0.121	21.40%	1.220	0.326	10.77%	
41	STP	Southern Pacific Resources Corp.	\$	16.1	60	27.7%	6.119	0.075	98.45%	6.518	0.093	107.62%	
42	TGE	TG World Energy Corp.	\$	7.8	60	7.5%	2.488	0.185	25.40%	1.946	0.212	21.30%	
43	TTR	Terra Energy Corp	\$	109.7	60	47.9%	2.250	0.024	64.06%	1.163	0.122	16.81%	
44	TWO	Twoco Petroleum Ltd.	\$	17.8	56	-9.3%	N/A	N/A	N/A	1.811	0.441	13.74%	
45	TYK	Tanganyika Oil Co. (now TSX)	\$	1,751.1	60	31.6%	0.540	0.023	15.70%	0.483	0.019	17.82%	
46	WSR	WSR Gold Inc.	\$	6.2	60	-46.5%	4.569	0.176	47.88%	4.460	0.298	41.20%	
47	WX	Wrangler West Energy Corp.	\$	43.1	60	-7.6%	0.827	0.149	9.41%	0.966	0.251	9.72%	
48	WZR	Westernzagros Resources Ltd	\$	125.8	14	-77.1%	N/A	N/A	N/A	N/A	N/A	N/A	
49	XE	Xemplar Energy Corp	\$	31.1	60	45.6%	3.056	0.076	48.84%	2.895	0.104	45.27%	
50	XEL	Xcite Energy Limited	\$	2.8	13	-94.2%	N/A	N/A	N/A	N/A	N/A	N/A	
									Average Monthly Volatility			39.25%	27.91%
									Annualized Volatility			135.98%	96.69%

* Yield is primarily earned in capital gains (stock appreciation), as very few of these firms have paid dividends during the period of observation
R-Squared statistics of less than 10% (> 0.10) are shown in red and would not be considered reliable regressions



Of the fifty firms previous presented in the June sample thirty-five had at least 60 months of historic data. Of these thirty-five, only two of them had coefficients of determination (r-squared statistics) greater than 0.10 (and these just barely, at 0.113 and 0.118). On the whole, the regressions for those thirty-five firms were quite unreliable. Contrast this to the updated table above and note that, of the thirty-three firms with at least 60 months of history, seventeen now have r-squared statistics greater than 0.10. One possible explanation for this increased correlation is that virtually all the firms have moved directionally with the market over the past five months.

Moreover, when the thirty-three firms are grouped⁵ into a mini-index and these combined results are regressed against the S&P/TSX Index, a Beta of 2.35 is obtained with a moderately reliable r-squared of 0.463. Further, the regressions are performing as would be expected relative to sample size. That is, as the sample size of the grouped data is increased, non-systematic noise is moderated and r-squared also increases. A group of ten firms gives a r^2 of 0.24, twenty 0.387, thirty is 0.458 and finally thirty-three is 0.463.

JUNE FINDINGS VERSUS CURRENT UPDATE

In the June paper, it was possible, using the Sharpe Ratio, to come to a specific cost of equity minimum that was unique to each individual O&G firm. This will no longer work given that the Sharpe Ratio has now turned negative. However, it is now possible to come to an overall Beta for the group as a whole – one that would set a benchmark standard of measure for all O&G juniors as at November 30, 2008. From this, firm specific risk factors would need to be considered in order to determine how the individual cost of equity would compare with that derived from the grouped beta.

Now the question becomes ‘which equity risk premium should be applied against this overall beta in order to arrive at a generalized cost of equity for the group as a whole?’ The traditional CAPM would use the long-term MRP. However, an increasing body of

⁵ See, for example, the Accession paper “Measuring the Error of Estimation in Grouped Stock Betas”.



research shows that there is a strong relation between the equity risk premium and expected market volatility.

THE IMPORTANCE OF USING AN EXPECTED (EX-ANTE) MRP

The historical MRP for the S&P/TSX (formerly the TSE300) index for the 72 year period of 1936 through 2007 is 5.7%⁶ with an annualized volatility of 14.9% for the years of 1952 through June 2008. Few investors could, however, be expected to accept the same 5.7% risk premium at a time when market volatility is 60%. For example, with a Beta of 2.35, a historic MRP of 5.7% and a risk-free rate of 3.94⁷%, the CAPM would suggest a levered cost of equity of 17.3% [$3.94\% + 2.35 \times 5.7\%$]. Intuitively, however, it is unreasonable to expect that risk-adverse investors will be attracted into such speculative equities during such turbulent times for only a 17.3% return. The problem is that the historic MRP has been employed in the calculation as a proxy for *expected* MRP. This is precisely the same difficulty that caused us to abandon the use of the Sharpe Ratio in setting a minimum cost of equity benchmark for these firms. Consider, for example, that there would never be an occasion where the expected return on the Market is less than the long-term risk-free rate, although historically there have been numerous periods where the actual realized Market return descended below the long-term risk-free rate for that period.

Chen et. al (2006 working paper)⁸ come to the conclusions that there is a very strong correlation between market volatility and *expected* MRP. Moreover, they point out previous conflicting evidence of the correlation between MRP and market volatility generally stems from the inappropriate use of ex-post historic MRP data, which is not a good predictor of ex-ante *expected* MRP. They have designed a model that they claim is a reliable predictor of expected MRP. This model is well beyond the scope of our little

⁶ See Accession Capital Corp paper “*A Pragmatic Method of Approximating the Minimum Cost of Equity for Junior Oil and Gas Firms...*” of June 2008, footnote 15.

⁷ The Govt. of Canada November 30, 2008 long-term benchmark bond yield, as per the Bank of Canada

⁸ Chen, L., Guo, H. & Zhang, L., *Equity Market Volatility and Expected Risk Premium*, 2006 working paper for Federal Reserve Bank of St. Louis – Research Division



discussion here. However, they do provide considerable insight to addressing question two above: “The intertemporal tradeoff between systematic equity market risk and expected returns is one of the most important cornerstones in most asset pricing theories ... Our results highlight the importance of using the ex ante equity premium instead of the realized equity premium in asset pricing tests.”⁹

CONCLUSIONS

During extraordinary times, making inferences based upon ordinary historic performance will not work. The previous application of the historic Sharpe Ratio unit-price-of-risk in setting a minimum expectation for the cost of equity fails entirely when future economic volatility cannot be expected to be in accord with the past. During extraordinary times, more sophisticated, and perhaps somewhat less transparent, method of predicting investors’ expectations must be employed.

⁹ Ibid, pg. 24