APPENDIX C

RELATIVE RISK ASSESSMENT FOR A BENCHMARK UTILITY

Introduction

In risk premium models the relative risk coefficient adjusts the overall market risk premium up or down depending on whether the individual security (company) is more or less risky than the market as a whole. More risky stocks have a relative risk coefficient greater than 1.0 and less risky stocks a relative risk coefficient less than 1.0. All risk premium models have this same risk assessment relative to the market, whether they are the capital asset pricing model (CAPM)[1] where the only source of risk is the market risk, or models that introduce other sources of risk. However, even within a two factor model, where the risk free rate is often regarded as risky due to interest rate risk,[2] or the Fama-French three factor model[3] where size and the market to book ratio (in their model termed the book to market ratio) are additional sources of risk, the coefficient on the market is still the main measure of risk. Estrada,[4] for example, shows that for the DOW 30 US stocks the simple CAPM expected return at 9.70% is only 0.20% more than that estimated using the three factor Fama-French Model and that the market risk premium is much larger than either the size or book to market premiums.

With the CAPM the relative risk assessment is the expected covariance between the security's return and that on the market scaled by the variance of the return on the market. This is called the security's beta coefficient (β) and measures the contribution of the security to the risk of a diversified portfolio. We normally estimate actual historic beta estimates by a simple ordinary least squares (OLS) regression of the security's return on that of the market. In any OLS regression the intercept is called alpha and the slope coefficient is called beta, which is why these terms are used pervasively in finance. However, estimating beta coefficients entails the exact

1 William Sharpe, "Capital asset prices: a theory of market equilibrium under conditions of risk," Journal of Finance 19, 1964.

2 Fisher Black, "capital market equilibrium with restricted borrowing", Journal of Business, July 1972 .

3 Eugene Fama and Ken French, "The cross section of expected stocks returns," Journal of Finance 59, 1992.

4 "The three factor model a practitioners guide," Journal of Applied Corporate Finance, Spring 2011.

same problem as that involved in estimating the market risk premium, since both use the actual or historic returns. This is, the estimate is very sensitive to what happened during the estimation period. To overcome this problem in estimating the market risk premium we go back over very long periods of time. For estimating beta coefficients we can't do this to the same extent, since the risk of a firm or industry changes much more than the overall risk of the market. Instead, we tend to use estimates from similar firms and industries as well as more judgment in understanding the economic and financial factors underlying the beta estimates. In this way we can get a better understanding of the *expected* beta coefficient, which is what is required.

Historic Beta Estimates for Canadian utilities

Until 2002 we have data on the "old" Toronto Stock Exchange Indexes. However, in 2002 the organisation of these indexes was taken over by Standard and Poors who harmonized them with their global indexes. These changes roughly coincided with the loss of many traditional Canadian utilities. It was also controversial in transferring Enbridge and TransCanada from pipelines, where they were regarded as similar to utilities into energy services. However, the historic risk metrics for the Canadian utility sector using the TSE sub-indexes were as indicated in Schedule 1. These estimates then reflect what happened over those time periods.

The great advantage of the sub-index betas is that they include more companies than the individual estimates and the data is more readily available.[5] This is particularly important due to the fact that a large number of regulated firms, like Consumers Gas, Maritime Electric, Terasen Gas (FortisEnergyBC) etc., have disappeared through corporate reorganisation. Although this means that their individual company betas have also disappeared, it does not mean that their economic impact has disappeared. Consumers Gas now shows up as part of Enbridge, Terasen Gas as Fortis etc., so their economic impact continues to show up in the sub index betas. However, there are two disadvantages: the first is that the largest regulated utility in Canada traditionally was Bell Canada, and its parent BCE was classified as a utility despite the impact of BCE's non-regulated operations. The second is that the sub indexes are weighted according to the

5 Index data is available at the end of the month, whereas company data is only available in May-June of the following year. The TSX sub index data ends in May 2002. The Telcos were removed from the utility sub index as part of this reorganisation.

TSE weights for each company. Consequently, these are not simple averages but *market value weighted* averages, so large market value companies, like BCE, have a disproportionate weight.

It is important to remember that betas are simply a statistical estimate of the extent to which a stock moves with the general market over a particular period of time. By convention, betas are estimated over a five-year period. This means that if a critical event happens during the estimation period, then the beta estimate will pick it up. However, once the event "passes out" of the five-year estimation window, the impact of the event will disappear from the beta estimate. For example, the graph in Schedule 1 shows that beta estimates were trending to a common average until 1987, after which the pipeline beta increased and the others decreased. This lasted for five years until they again came together.

If I had estimated betas during the period ending say in 1990, I would have estimated that gas and electric betas had dropped and pipeline betas increased. However, is it reasonable to say that gas and electric risk dropped during this period? The answer is no. What happened was that there was a large stock market crash in October 1987 (-22.0%) and this was such a significant factor that whatever happened in that one month affected all the beta estimates for the next five years until October 1992, when the October 1987 results were no longer in the estimation period.

Professional judgement would indicate that it is unreasonable to just use the statistical estimate without recognising the underlying events that caused it, and then to make appropriate adjustments. It is my judgement that betas tend to revert to their long run average levels: for the market as a whole this is 1.0, but for regulated firms from Schedule 1, this is about 0.45-0.55.[6] There is no indication from Schedule 1 that the non-Telco betas were reverting to 1.0.[7] Consequently it is illogical to weight them with 1.0, as an "adjusted beta", since there is no expectation that their risk is increasing to that of an average firm. So what explains the dramatic changes in betas at the end of the TSE data period in 2002 as indicated below?

6 This is also accepted in the literature. Gombola and Kahl, "Time series properties of utility Betas," Financial Management, 1990, come to the same conclusion.

7 The Telcos have been reclassified out of utilities, since they are no longer ROE regulated.

	Gas/Electri	Telco	Pipes	Utility
DEC/96	0.52	0.60	0.54	0.60
DEC/97	0.47	0.61	0.44	0.59
DEC/98	0.53	0.80	0.42	0.83
DEC/99	0.37	0.96	0.18	0.96
DEC/00	0.21	0.82	0.06	0.80
DEC/01	0.17	0.87	-0.14	0.83
DEC/02	0.14	0.85	-0.18	0.80

The answer is Nortel and the Internet bubble. During the late 1990s, the technology and internet boom were driving North American markets. Nortel was controlled by BCE, so that BCE's stock price was being driven by Nortel and the internet boom. In fact, this was driving the entire Canadian stock market as Nortel and JDS Uniphase became an increasing part of the market and at one point made up almost 35% of the value of the TSE300. As the prices of Nortel and JDS Uniphase increased, so did the Telco and Utility indices and the TSE300. When this boom turned into a crash and Nortel declined from $1,240 to under $10,[8] Nortel took the Canadian market and the Telco and utility indices down with it. This is what caused the high beta estimates for the Telco and utility indexes in both 2000 and 2001.

In contrast, the gas and electric and pipeline betas declined. The reason for this was that as the market went on a technology driven boom and bust, these stocks were largely ignored. In the case of the Pipeline sub index, the collapsing share price of TransCanada Pipelines during 1999 and its recovery during 2000 was against a strong equity market in 1999 and a weak one in 2000. This movement of TransCanada's share price against the general market movement induced a negative correlation and the low beta estimate for the pipeline sub index.[9] The message is simply that "betas" do not come out of thin air: they reflect what happens in both the market as a whole as well as an individual stock or industry.

After 2002 the TSX introduced new indexes and back dated the data to 1987. For the new utility index the sub index beta estimates are in Schedule 2. This graph is slightly different from that in

8 Nortel has now filed for bankruptcy protection, the prices are adjusted for a 1:10 reverse split.

9 This stock market reaction was due to the poor performance of TransCanada's non-regulated operations in 1999 and the programme of retrenching and selling them off in 2000.

Schedule 1 in that it includes the beta coefficient estimated both with (beta1) and without (beta2) the impact of interest rate changes, as well as the sensitivity of the utility sub index to changes in interest rates which I call "gamma." We can make several comments looking at Schedule 2 in isolation and comparing it with Schedule 1.

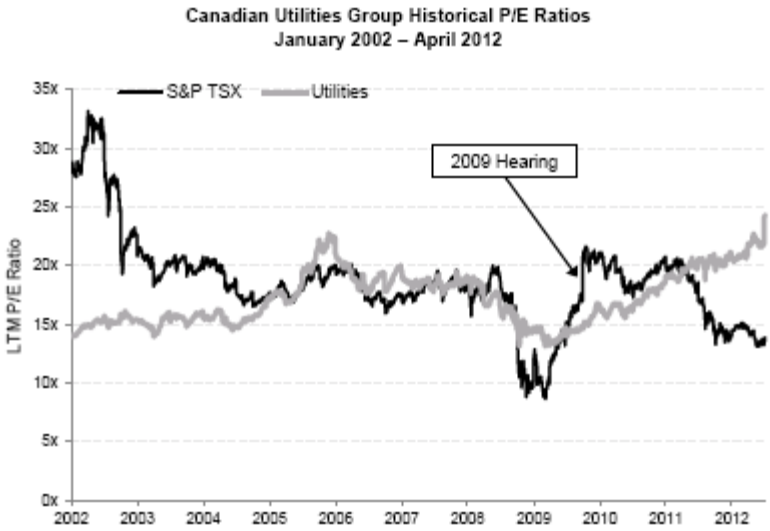
First is that the beta estimates for the utilities are essentially the same whether we include or ignore the impact of interest rate risk. Second we can clearly see the same effect as in Schedule 1; that betas were pulled down as Nortel and the tech boom affected the Canadian market. However, we can now see that by 2008 the internet bubble/tech effect had passed out of the five year estimation window and betas were reverting to their normal level of close to 0.50. However, the stock market crash starting September 2008 clearly has delayed this movement back to normal as betas started to drift down again, although nowhere near as dramatically as in the Internet crash. Finally, utilities are clearly interest sensitive stocks as the consistent positive gamma coefficients indicate. It is also clear that this sensitivity exhibits a negative correlation (-0.43) with the beta estimates, that is, beta coefficients tend to fall as gamma coefficients increase. This is because interest rates tend to increase during good times as the stock market booms and then fall in recessions. This interest rate sensitivity reduces the exposure of utility investors to the market during recessions when interest rates tend to fall as the Bank of Canada conducts a more expansionary monetary policy.

This statistical result echoes the comment of RBC utility analyst Maureen Howe who commented that Canadian utilities are[10]

> "like convertible bonds. When interest rates are low, as they currently are, the companies trade on their bond value and are supported by tax-efficient dividend yields. When the 10-year GOC yield rises above 6%-6.5%, the Canadian companies trade on the basis of their underlying earnings and P/E."

Maureen Howe's observation is confirmed by the relative performance of the PE multiples for the TSX versus the Utilities as indicated in the following graph provided in a recent hearing before the BCUC.

10 October, 3 2001 RBC Morning Comment.



The graph indicates that whereas the PE multiple of the TSX is weaker than before 2005, the very low interest rates have supported the valuation of dividend rich utilities so that their PE ratios have increased. This observation is consistent with Maureen Howe's observation that with low interest rates utilities trade on their "bond or fixed income" value in line with the observation that their cost of equity capital has declined.

We can see the same effects in the individual beta estimates where the average utility beta is graphed in Schedule 3.This average is both with and without TransAlta, since it is not strictly a rate of return regulated utility anymore. Again we see the Nortel internet bubble effect and the trend of the betas back toward their normal level being interrupted by the stock market crash of 2008/9. The individual beta estimates are provided in Schedule 4. Note as indicated above, I place little weight on individual beta estimates as they reflect wheat did or did not happen during the estimation period, rather than being a forward risk coefficient.

Further evidence of relative risk

The estimation of betas is a statistical exercise but all it involves is the intuition that if a stock is risky, when the market goes up it goes up more than the market and, conversely, when the market goes down it goes down more than the market. On the other hand a low risk stock does not move very much with the market. As a result, and like a bond, it lowers the overall volatility

of the portfolio. In the extreme a totally risk free asset would be uncorrelated with the market so by definition has no "market" risk.[11]

In Schedules 5-7 I chart the price performance of the Canadian utilities against the TSX Composite index specifically over the period of the financial crisis. For example, Schedule 5 has the charts for Emera and Fortis. They clearly show the dramatic impact of the period from September 2008 until Summer 2009 when the TSX first dropped over 50% from its high and then recovered 60% of that 50% drop. In contrast Fortis only dropped 20% and Emera less than that. It is this performance that lowers their recent beta estimates, since they demonstrated in the worst stock market crash for decades just how low risk Canadian utilities are. Further as extreme events they have a disproportionate effect on any estimates that come from minimizing the squared error, such as ordinary least squares beta estimates.

In Schedule 6 are the same graphs for Valener (former Gaz Metro) and Canadian Utilities. Gaz Metro dropped by just over 20% and CU about the same. Finally in Schedule 7 are the same graphs for Enbridge and for Pacific Northern Gas which I have traditionally regarded as the riskiest Canadian utility. For PNG we can clearly see that it behaved much more like the market as a whole during the crash and recovery since it lost almost 50% of its value like the market. Further we can see the more dramatic recovery and its recent 50% increase in price indicating how unique factors significantly affect the beta estimates. In this case AltaGas announced on October 31, 2011 that it was acquiring PNG for $36.75 so the share price immediately jumped. The acquisition closed on December 20, 2011 and the shares are now delisted.

For Enbridge we also see that it sailed through the stock market crash and recovery with scarcely any losses. This was acknowledged at the time. On December 9, 2008 a story in the Calgary Herald[12] discussed the implications of the price of oil dropping from $144 US to $50 and what it meant for oil and gas companies and pipelines. Hal Kvisle, CEO of TransCanada, noted that although it was more difficult to raise money TransCanada had just raised $1.16 billion in an

11 The R squared of a regression of its stock return against the market would by definition be 0. The R squared of a "beta" regression is largely a meaningless statistic since the explained variance by definition is the beta squared times the variance of the market return.

12 Shaun Polczer, "Pipeline companies weather darkest hour; Executives say crisis worst in oil patch history" Calgary Herald, December 9, 2008.

issue that was over subscribed. Kvisle indicated that it underscored the attractiveness of infrastructure investments in troubled times. The article also noted that Enbridge had increased its dividend by 12 per cent and upped its 2009 earnings guidance by about 20 per cent. Enbridge's CEO Pat Daniel said he's confident "the company can maintain 10 per cent earnings per share growth for at least the next five years, a testament to the ***low-risk business model*** (emphasis added) of pipelines in general." The article went on to state that "Enbridge has been one of the top performers on the TSX, losing only 1.7 per cent year-over-year compared to more than 41 per cent for the TSX main board and a whopping 56 per cent for the TSX's capped energy index since June." It further quoted Daniel as saying "I think that speaks to the low risk, steady predictable nature of our business, ….***People don't really realize it until you get into tough times like this.***" (emphasis added) The article went on to note that "Enbridge shares gained $1.32, or three per cent, on the Toronto Stock Exchange on Monday to finish at $39.50 while Trans-Canada added 60 cents to close at $33.90."

Although Pat Daniels stated that people don't realise how low risk Enbridge's business is, this is not true as the stock market clearly noticed this. In my judgment, almost all the utilities demonstrated the low risk nature of their business throughout the financial crisis. This is not to say that they have no risk, the fact that their betas are positive indicates they do have market risk, as like all securities their prices move with the market. However, I am sure that many investors would have preferred to hold a diversified portfolio of utility stocks as of September 1, 2008, rather than the TSX composite.

US utility stocks as a comparison

I have started looking at the relative risk of a sample of low risk US utilities. The US utilities represent the intersection of two samples used previously by Ms. McShane and Dr. Vilbert both of whom have testified before Canadian boards on behalf of utilities. As a result, I regard this intersection of their "sets" as what might be regarded as smaller and purer US utilities, rather than the bigger more diversified holding companies that are in the S&P500 index. Schedule 8 provides a graph of their average beta estimates. These are estimated in the same way as the Canadian betas from monthly holding period returns over a five year time period updated monthly.

The estimates from this sample of specially chosen low risk US utilities are very similar to the population of Canadian utility holding companies. This demonstrates that it is possible to search the entire population of US utilities and create a small sample of low risk US utilities similar to the overall population in Canada. Of course it does not show that the typical US utility is equivalent in risk to the typical Canadian utility. In Schedule 9 are the recent beta estimates for the individual US utility holding companies and with this caveat we can see that their average beta at the end of 2012 was 0.29 or almost the same as that for the Canadian utility holding companies. The betas of these low risk US utilities were increasing to average 0.64 immediately prior to the financial crisis and then, as in Canada, their stability during the financial crisis caused their betas to drop.

Adjusted betas

Utility witnesses frequently adjust utility betas not toward their grand mean of 0.50 or so, but the overall market mean of 1.0. As low risk businesses this *inevitably* increases their "adjusted beta." Such a process is justified by the seminal work of Marshall Blume[13] who showed that if there is measurement error, when we estimate a very low beta the chances are the "true" beta is underestimated and vice versa. For the whole universe of stocks he recommended that we adjust betas by taking 2/3 of the estimated beta and adding 0.33, which essentially means weighting them 1/3 with the market mean of 1.0 and 2/3 with the actual beta. This procedure means that low betas are increased and high betas are reduced. However, low estimates for utilities do not mean they are under-estimated, since utility betas are perennially low. This is what the long history of betas estimated back to 1956 demonstrates. Instead as Gombola and Kahl demonstrated utility betas are better mechanically adjusted by weighting with their grand mean. However, rather than a mechanical weighting I generally prefer to use judgment constrained by the actual historic evidence on betas.

Canadian utilities are generally not inter-listed in the US and apart from the very largest, like TransCanada and Enbridge, trade on the pink sheets if at all, so they mainly trade on the TSX. On October 11, 2013, I recorded basic data for the following Canadian utility holding

13 Marshall Blume, Betas and their regression tendencies, Journal of Finance June 1975.

companies. In particular the following captures their beta estimates as reported by RBC, and Google as well as my own estimates made from the return data up until December 2012.

			BETAS			
		RBC Yield	Booth	RBC	GOOGLE	MKT CAP (
TransCanada	TRP	4.18	0.33	0.36	0.26	30
Enbridge	ENB	2.99	0.22	0.21	0.05	34.89
Canadian Utilities	CU	2.74	-0.02	-0.03	-0.12	9.1
Emera	EMA	4.77	0.23	0.21	0.19	3.87
Fortis	FTS	4.01	0.13	0.28	0.04	6.55
Valener	VNR	6.45	0.32	0.24	0.15	0.59
Veresen	VSN	8.39	0.4	0.28	0.27	NA
Average		4.19	0.20	0.21	0.10	14.17
Median		4.10	0.23	0.23	0.10	7.83

The average and median beta estimates by the Royal Bank of Canada were 0.21 and 0.23 respectively or indistinguishable from my own estimates (Booth) of 0.20 and 0.23. The main difference seems to be that for Fortis where there have been data errors in the past. The key insight, however, is that the RBC betas like mine so not seem to have been "Blume adjusted" by weighting the actual estimates with one. Quite the contrary, they seem to be the actual or what utility witnesses refer to as the "raw" beta estimates.

What is interesting about the Google betas[14] is that their betas are almost uniformly lower than either mine or RBCs with average and median betas of 0.10. I have noted this previously so it seems to be a common feature of Google betas. Google clearly uses a different data provider to Yahoo, which uses Compustat or what is now known as Capital IQ by S&P, but the important insight is that their beta estimates also do not appear to be Blume adjusted either.

RBC also reported the following relative risk assessments (betas) in their November 2011 equity strategy report which was focused on Canadian financial institutions, which is why they are boxed in the table.

14 Yahoo does not report betas for the Canadian companies.

TSX Sector Betas	1 Year	3 Years	5 Years	Average
Energy	1.30	1.25	1.27	1.27
Materials	1.19	1.08	1.26	1.18
Industrials	0.87	0.90	0.87	0.88
Cons Disc	0.70	0.62	0.56	0.63
Consumer Staples	0.46	0.32	0.35	0.38
Health Care	1.05	0.53	0.50	0.70
Financials	0.82	1.04	0.92	0.93
Banks	0.81	1.00	0.91	0.90
Diversified Financials	0.57	0.82	0.77	0.72
Insurance	1.01	1.27	1.04	1.11
Real Estate	0.68	0.84	0.76	0.76
Info Tech	1.02	0.88	0.92	0.94
Telecom	0.39	0.40	0.47	0.42
Utilities	0.55	0.40	0.46	0.47

Priced as of Nov 17, 2011

Source: RBC Capital Markets Research, Bloomberg

The utility betas estimated by RBC are for the sub index and are broadly consistent with my own estimates. The utility betas average 0.47 and range from 0.55 using one year to 0.40 using three years of data which would go back and capture their demonstrated low risk characteristics during the financial crisis.

Similarly the following table gives the betas for the surviving US utilities. In this case I have also added the betas as reported by Yahoo and Google Finance. Again the average beta is 0.41 according to RBC and 0.29 for my estimates ending in 2012. The Yahoo Finance and Google betas average 0.43 and 0.35 respectively, while in all cases the medians are very similar. None of the beta estimates by RBC, Google or Yahoo seem consistent with any type of Blume adjustment methodology and the differences likely reflect different time horizons and the fact that my estimates are from data until the end of 2012.

		RBC	BOOTH	YAHOO	GOOGLI	MKT CA
AGL	**GAS**	**0.51**	**0.41**	**0.36**	**0.42**	**5.3**
NEW JERSEY RESOURCES	**NJR**	**0.35**	**0.23**	**0.56**	**0.26**	**1.8**
NORTHWEST	**NWN**	**0.36**	**0.26**	**0.27**	**0.32**	**1.12**
PIEDMONT	**PNY**	**0.51**	**0.30**	**0.48**	**0.39**	**2.4**
VECTREN	**VVC**	**0.45**	**0.35**	**0.41**	**0.45**	**2.75**
WGL	**WGL**	**0.32**	**0.22**	**0.50**	**0.28**	**2.18**
Average		**0.42**	**0.29**	**0.43**	**0.35**	**2.59**
Median		**0.41**	**0.28**	**0.45**	**0.36**	**2.29**

Nicor was acquired by AGL in December 2010

In comparing the Canadian versus the US samples of utilities the US firms are quite small with average market capitalisation (total equity market value) of US$2.59 billion versus the average for the Canadian companies of $14.2 billion. Even after we adjust for the outliers and look at the medians, it still much higher for the Canadian sample at $7.83 billion versus US$2.29 billion in the US. Why this is important is that one of the criticisms levelled against the CAPM is that beta adjusted, small firms earn higher rates of return than large firms, which some attribute to risk, so we might expect a higher risk level for these US firms than for the Canadian sample simply due to their smaller average size.

However, of more importance is that the way RBC, Yahoo, Google and I estimate betas appears to be consistent with conventional practise. One of the biggest data providers in Canada is the Financial Post where their Corporate Analyzer data base includes ten year financial data for larger publicly listed Canadian companies. Their definition of beta is as follows:

Beta (Corporate Profiles)

Beta factors are derived from a historical regression of percentage share price changes for the selected company on percentage changes in the TSE 300 price index. The unadjusted slope coefficient from this regression is the beta factor. Beta factors may be computed on a variety of weekly or monthly data. Betas shown in FP Analyzer are for 52 weeks, 36 months, 60 months and 120 months.

Again there is no discussion of "adjusting" betas using the Blume procedure.

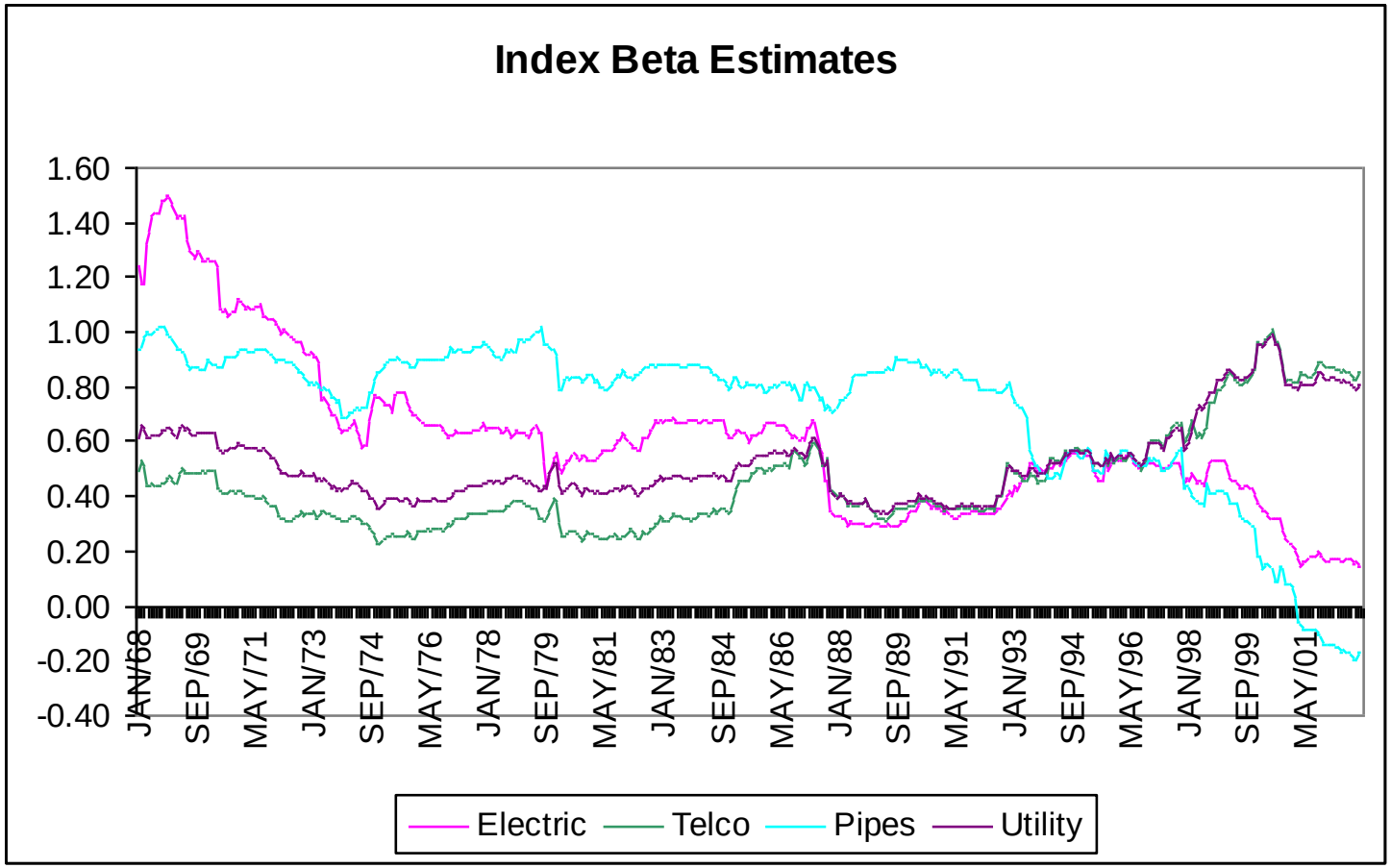
However, what is also important is that even if we Blume adjust my average beta estimate of 0.20 the "adjusted beta" is only 0.46 (0.33+0.66*0.20), while if we adjust to the utility mean of about 0.55 they are about 0.32 (.33*.55+.66*.20). Even the highest Blume adjusted beta for TransCanada using the RBC data only gives 0.57 (.333+.667*0.36) I do not believe in these

mechanical adjustments but they support a reasonable range going forward for the relative risk of a benchmark Canadian utility to continue to be 0.45-0.55.

One final comment is that there is often discussion of the hollowing out of the Canadian capital market and the fact that the TSX is no longer a diversified index being heavily bank stocks and resource firms. This does not affect utility stocks, since they are generally Canadian held and not inter-listed in the US, but as a check I looked at the risk of the TSX utility index against the S&P500 index both hedged and unhedged against foreign exchange rate movements. The results are in the graph is in Schedule 10. Beta1 is the same beta estimate graphed in Schedule 2, while US H is the beta of the Canadian utility index against the S&P500 index hedged against changes in the C$:US$ foreign exchange rate, while US UN takes that change into account. The average and median values for Beta1 are 0.33 and 0.42 while for the hedged S&P500 index they are 0.30 and 0.36 and unhedged 0.23 and 0.26. Clearly the beta estimates against a more diversified US index are generally somewhat lower than against the Canadian market regardless of whether or not there is an adjustment for foreign exchange rate risk.

In conclusion, I see nothing in the recent capital market experience in either the US or Canada that would cause me to deviate from my normal generic risk assessment for a Canadian utility.

SCHEDULE 1


Index Beta Estimates
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1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
-0.20
-0.40
JAN/68
SEP/69
MAY/71
JAN/73
SEP/74
MAY/76
JAN/78
SEP/79
MAY/81
JAN/83
SEP/84
MAY/86
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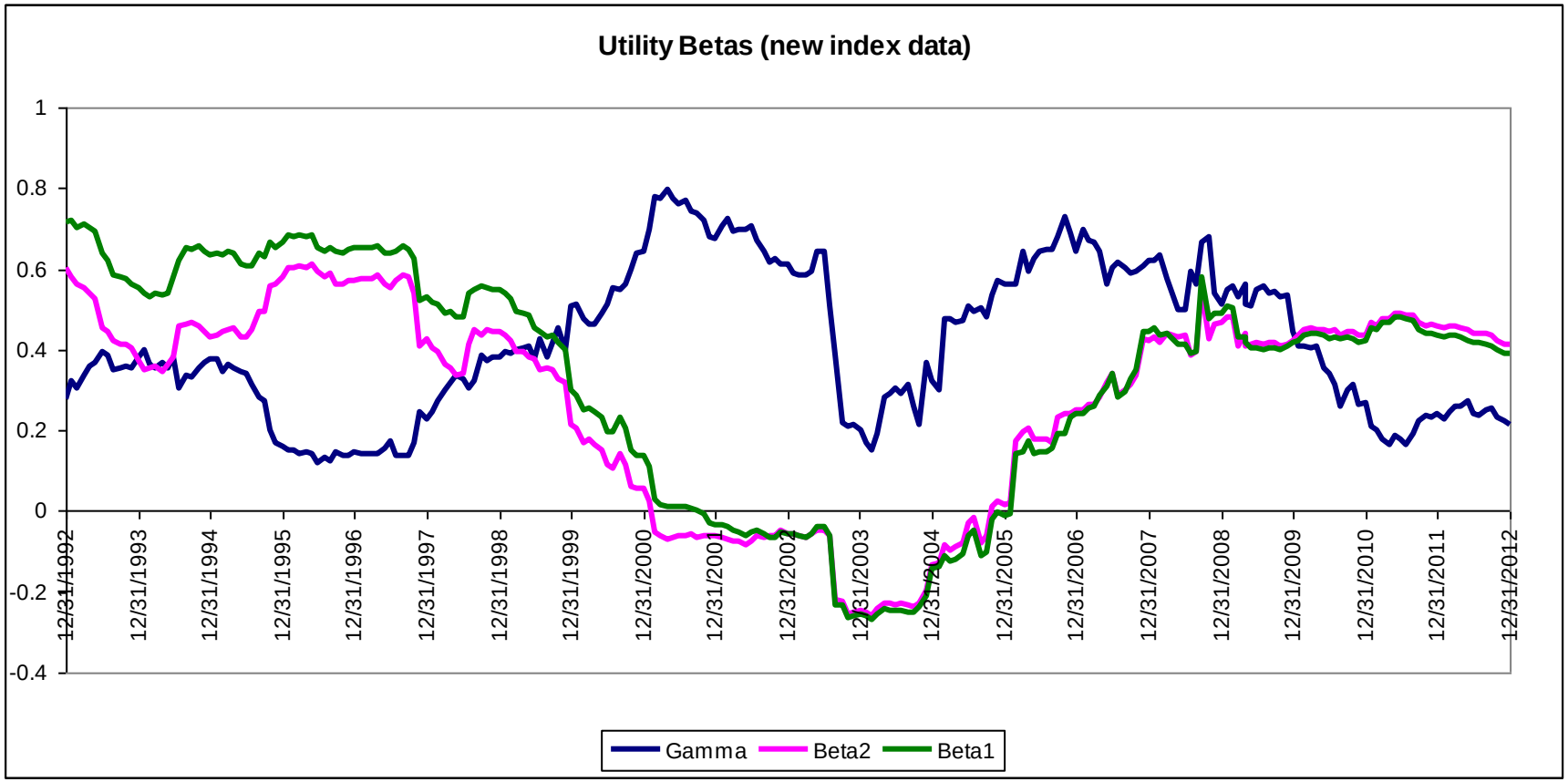
Electric
Telco
Pipes
Utility

SCHEDULE 2


Utility Betas (new index data)
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
12/31/1992
12/31/1993
12/31/1994
12/31/1995
12/31/1996
12/31/1997
12/31/1998
12/31/1999
12/31/2000
12/31/2001
12/31/2002
12/31/2003
12/31/2004
12/31/2005
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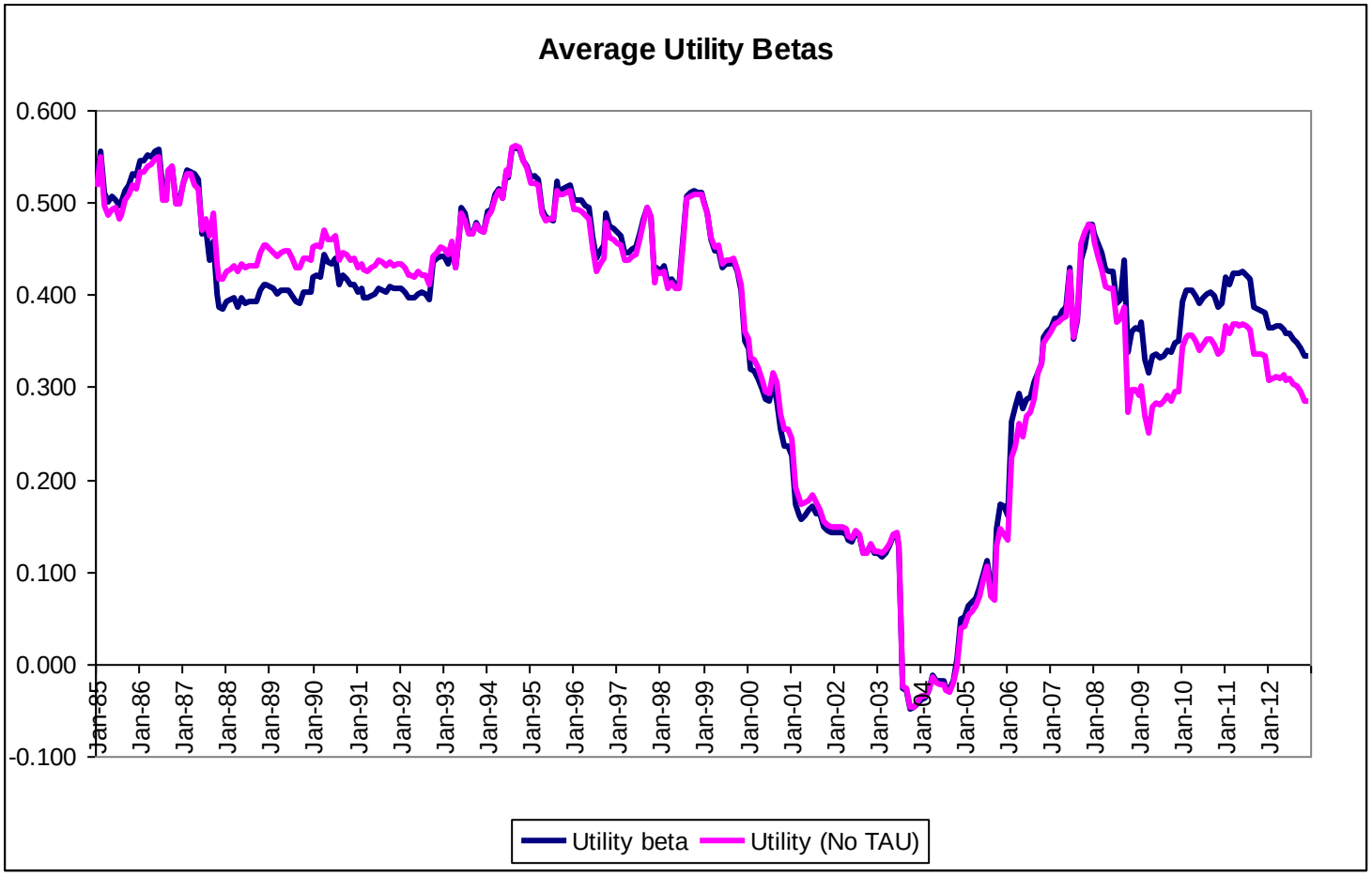
12/31/2009
12/31/2010
12/31/2011
12/31/2012
Gamma
Beta2
Beta1


Average Utility Betas
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0.500
0.400
0.300
0.200
0.100
0.000
-0.100
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Utility beta
Utility (No TAU)

	CUL	EMERA	Enbridge	Fortis	GMI	PNG	TAU	TRP	Ft Chicago	Utility bet
2000	0.39	0.28	0.05	0.22	0.18	0.47	0.05	0.17		0.23
2001	0.29	0.21	-0.13	0.13	0.10	0.47	0.06	-0.07		0.13
2002	0.25	0.16	-0.20	0.13	0.07	0.47	0.08	-0.08		0.11
2003	0.16	-0.05	-0.40	-0.05	0.02	0.36	-0.06	-0.40	0.02	-0.05
2004	0.14	-0.02	-0.32	0.03	0.16	0.48	0.14	-0.19	0.10	0.06
2005	0.38	0.05	-0.18	0.23	0.19	0.51	0.42	-0.19	0.19	0.18
2006	0.51	0.09	0.22	0.48	0.42	0.47	0.42	0.30	0.33	0.36
2007	0.62	0.21	0.52	0.61	0.75	0.23	0.51	0.48	0.33	0.47
2008	0.21	0.14	0.32	0.20	0.51	0.25	0.86	0.37	0.51	0.37
2009	0.08	0.16	0.32	0.20	0.38	0.45	0.74	0.40	0.44	0.35
2010	0.06	0.22	0.34	0.16	0.35	0.41	0.76	0.40	0.37	0.34
2011	0.03	0.21	0.32	0.15	0.36		0.73	0.37	0.35	0.31
2012	-0.02	0.23	0.22	0.13	0.32		0.63	0.33	0.40	0.28


EMERA INCORPORATED
EMA.TO
^GSPTSE
13 Jan, 2012
+60%
+40%
+20%
0%
-20%
-40%
-60%
© Yahoo! UK & Ireland
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Volume
8.0
6.0
4.0
2.0
0.0
Millions
FORTIS INC
FTS.TO
^GSPTSE
13 Jan, 2012
+30%
+20%
+10%
0%
-10%
-20%
-30%
-40%
-50%
© Yahoo! UK & Ireland
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Volume
10.0
5.0
0.0
Millions


VALENER INC
VNR.TO
^GSPTSE
13 Jan, 2012
+10%
0%
-10%
-20%
-30%
-40%
-50%
© Yahoo! UK & Ireland
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Volume
600.0
400.0
200.0
0.0
Thousands

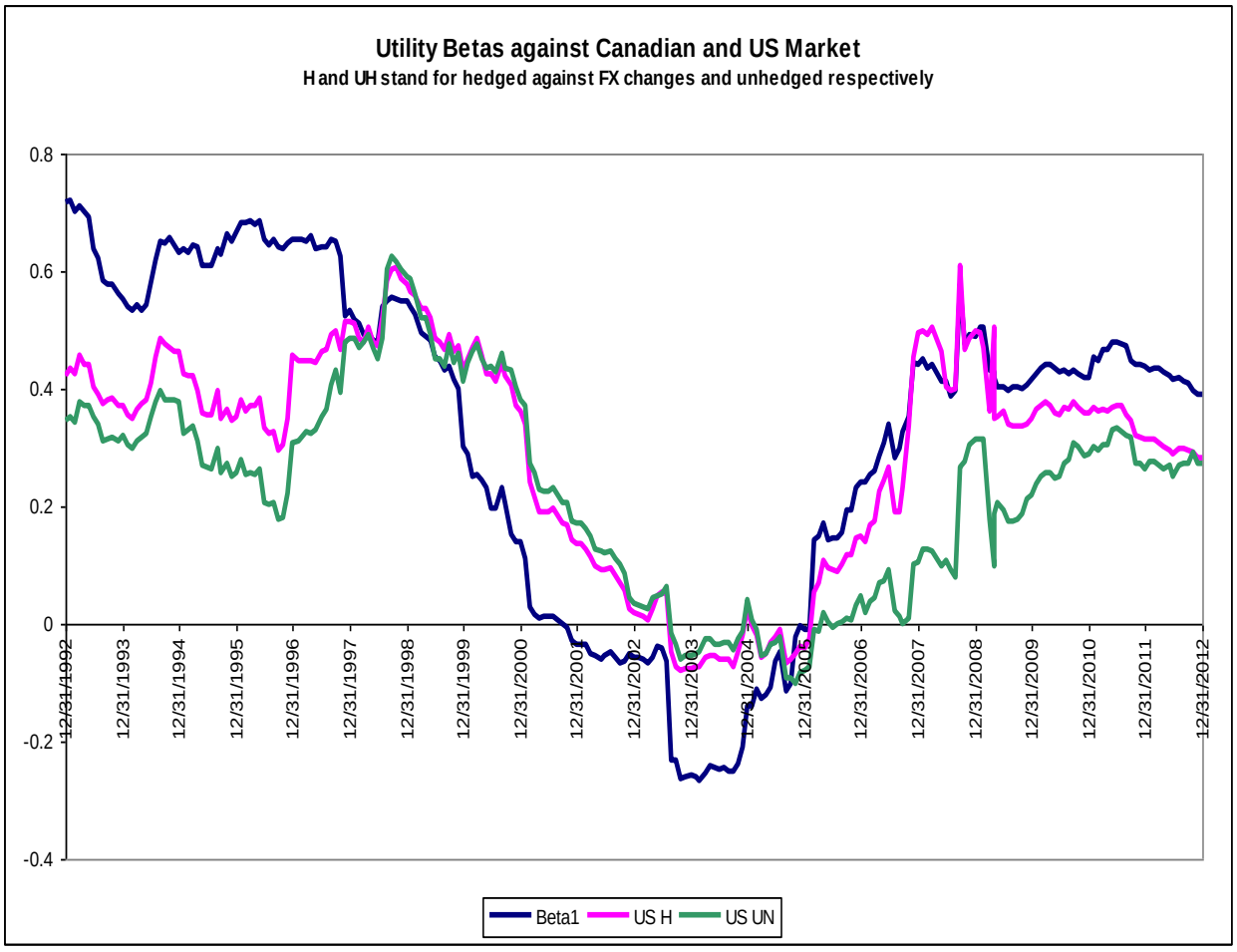

CANADIAN UTILITIES LTD., CL.A,
CU.TO
^GSPTSE
13 Jan, 2012
+60%
+40%
+20%
0%
-20%
-40%
-60%
© Yahoo! UK & Ireland
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Volume
3.0
2.0
1.0
0.0
Millions


ENBRIDGE INC
ENB.TO
^GSPTSE
13 Jan, 2012
+100%
+80%
+60%
+40%
+20%
0%
-20%
-40%
-60%
© Yahoo! UK & Ireland
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Volume
15.0
10.0
5.0
0.0
Millions
Splits


PACIFIC NORTHERN GAS LTD
PNG.TO
^GSPTSE
23 Dec, 2011
+150%
+100%
+50%
0%
-50%
© Yahoo! UK & Ireland
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Volume
200.00
150.00
100.00
50.00
0.00
Thousands


US Low Risk Utilities
1.2
1
0.8
0.6
0.4
0.2
0
Nov-77
Nov-79
Nov-81
Nov-83
Nov-85
Nov-87
Nov-89
Nov-91
Nov-93
Nov-95
Nov-97
Nov-99
Nov-01
Nov-03
Nov-05
Nov-07
Nov-09
Nov-11

	AGL	NJ Resources	Northwest	Piedmont	Vectren	WGL	Nicor	Average
12/31/1998	0.59	0.46	0.47	0.50	0.34	0.48	0.41	0.46
12/31/1999	0.42	0.33	0.19	0.30	0.14	0.29	0.26	0.27
12/31/2000	0.26	0.24	0.07	0.16	0.17	0.20	0.18	0.18
12/31/2001	0.26	0.24	0.07	0.16	0.17	0.20	0.05	0.17
12/31/2002	0.23	0.09	-0.10	0.10	0.21	0.15	0.22	0.13
12/31/2003	0.20	0.03	-0.18	-0.04	0.33	0.13	0.32	0.12
12/31/2004	0.30	0.11	0.01	0.12	0.46	0.22	0.45	0.24
12/30/2005	0.38	-0.05	0.06	0.25	0.34	0.22	0.52	0.25
12/29/2006	0.38	0.02	0.14	0.33	0.51	0.27	0.90	0.37
12/31/2007	0.50	0.51	0.75	0.58	0.56	0.70	0.87	0.64
12/31/2008	0.32	0.15	0.35	0.05	0.26	0.23	0.39	0.25
12/31/2009	0.40	0.13	0.25	0.20	0.37	0.17	0.39	0.27
12/31/2010	0.44	0.22	0.31	0.25	0.41	0.25	0.52	0.34
12/30/2011	0.44	0.26	0.32	0.32	0.40	0.29	0.48	0.36
12/31/2012	0.41	0.23	0.26	0.30	0.35	0.22	NA	0.29


Utility Betas against Canadian and US Market
H and UH stand for hedged against FX changes and unhedged respectively
0.8
0.6
0.4
0.2
0
-0.2
-0.4
12/31/1992
12/31/1993
12/31/1994
12/31/1995
12/31/1996
12/31/1997
12/31/1998
12/31/1999
12/31/2000
12/31/2001
12/31/2002
12/31/2003
12/31/2004
12/31/2005
12/31/2006
12/31/2007
12/31/2008
12/31/2009
12/31/2010
12/31/2011
12/31/2012
Beta1
US H
US UN