**ONTARIO ENERGY BOARD**

**2024 Review of Cost of Capital Parameters and Deemed Capital Structure**

**INTERROGATORIES**

**of**

**INDUSTRIAL GAS USERS ASSOCIATION (IGUA) and**
**ASSOCIATION OF MAJOR POWER CONSUMERS IN ONTARIO (AMPCO)**

**for**

**NEXUS ECONOMICS**

**M3-2-AMPCO/IGUA-23**

**Reference:** On page 10, Nexus includes Figure 4, which includes its projections for annual infrastructure investments by Ontario Distributors from 2024-2050, which it forecasts will grow due to increasing demand.

**Questions:**

(a) Please explain more particularly why Nexus considers increasing demand to be a negative risk as opposed to a positive business consideration.

(b) The discussion implies that increasing investment requirements facing Ontario distributors pose issues in attracting equity and debt investment on reasonable terms. Please provide any empirical support that Nexus has for this assertion.

(c) Please provide all data and workpapers (in excel format), including all assumptions, formulae and calculations, used to estimate the annual investment requirement figures (for each year) that were included in Figure 4.

(d) Please provide all data and workpapers (in excel format), including all formulae and calculations, used to prepare Figure 4.

**M3-2-AMPCO/IGUA-24**

**Reference:** On page 27, Nexus includes Figure 6, which includes its projections for annual average investments by Ontario Distributors from 2024-2050, under both Nexus' "Net Zero Scenario" and its "Reference Scenario."

**Questions:**

(a) Please provide all data and workpapers (in excel format), including all assumptions, formulae and calculations, used to estimate the annual investment requirement figures (for each year) under both scenarios that were included in Figure 6.

(b) Please provide all data and workpapers (in excel format), including all formulae and calculations, used to prepare Figure 6.

**M3-3-AMPCO/IGUA-25**

**Preamble:** On page 32, Nexus includes Figure 7, which reports "Average Earned Return on Equity for Ontario Distributors less Deemed ROE" over the 2015-2022 period.

**Questions:**

(a) Please clarify whether the reported averages are "simple averages" (i.e., each utility's numbers are equally-weighted) or a "weighted average" (weighted, for example, by the percentage of total revenues, total distribution, or total regulated assets).

(b) If the answer to part (a) is that the results are based on "simple averages," please reproduce Figure 7 based on a "weighted average" based on; (i) the percentage of total distribution; and (ii) the percentage of total regulated assets.

(c) Please replicate Figure 7 for each of the top three Ontario distributors (Hydro One Inc., Toronto Hydro, and Alectra), which approximately account for over 70% of total Ontario distribution in a given year.

(d) Please provide all data and workpapers (in excel format), including all formulae and calculations, used to prepare Figure 7, as well as for the requested variations requested in parts (b) and (c) above.

**M3-10-AMPCO/IGUA-26**

**Reference:** On page 4 of its evidence, Nexus includes Figure 1, the title of which suggests that it provides a "Comparison of Ontario Authorized ROEs to Canadian and U.S. Peers (Levered to 60:40)."

**Questions:**

(a) On page 76, Nexus provides two formulae (copied below):

$$ROE_u = \frac{ROE_{Lev} + \frac{D}{E}(1-\tau) \times r_f}{1 + \frac{D}{E}(1-\tau)}$$

$$ROE_{Lev} = ROE_U + D/E\,(1-\tau)(ROE_u - r_f)$$

In footnote 103 (page 76), Nexus provides a reference for using these formulae; however, that reference (Giddy, 2006) does not make reference to the first equation. Can Nexus please:

(i) Explain the mathematical derivation used to obtain the first equation referenced above, and provide an example using actual numbers it uses in its report as to how it is applied by Nexus.

(ii) Provide an example using actual numbers it uses in its report as to apply the second equation referenced above.

(b) Please provide all data and workpapers (in excel format), including all formulae and calculations, used to prepare Figure 1.

(c) Footnote 3 on page 4 states:

> *We also added "re-levered" Alberta and British Columbia returns since these jurisdictions use a 55 percent Debt capital structure (more equity than is currently the case in Ontario).*

Could Nexus please explain its assertions that the current corresponding implied allowed equity ratios (ERs) in Alberta and British Columbia (B.C.) are 45%.

For example, Figure 27 on page 80 of Concentric's evidence shows the allowed ERs in Alberta and B.C. are 37% and 41% respectively.

If this was an error on Nexus' part, please reproduce Figure 1, as well as the supporting data and workpapers (in excel format) using the correct Alberta and British Columbia equity ratios.

**M3-10-AMPCO/IGUA-27**

**Reference:** On page 22, Nexus includes Figure 5, which reports *"Authorized ROEs for Ontario and Peer Jurisdictions (Re-levered to 60:40)"*.

**Questions:**

(a) Please provide the calculations, including formulae, inputs etc., used to "re-lever" Alberta and B.C. ROE estimates of 9.91% and 10.31% (the current allowed ROEs for which are 9.28% and 9.65% respectively based on their currently allowed ERs of 37% and 41% respectively, as all noted on Figure 27 on page 80 of Concentric's evidence).

(b) Please provide all data and workpapers (in excel format), including all formulae and calculations, used to prepare Figure 5.

(c) Footnote 23 on page 22 states that the Authorized Debt-to-Capital ratios for Alberta and B.C. are 55%. Could Nexus please explain its implied assertions that the current allowed ERs in Alberta and B.C. are 45%, whereas Figure 27 on page 80 of Concentric's evidence shows the allowed ERs in Alberta and B.C. are 37% and 41% respectively. Assuming this

was an error on Nexus' part, please reproduce Figure 5, as well as the supporting data and workpapers (in excel format), using the ERs as reported by Concentric.

(d) Please confirm that that Ontario ROEs and ERs are in line with those deemed in the two Canadian jurisdictions it examined. If not confirmed, please explain.

**M3-10/12-AMPCO/IGUA-28**

**References:** Alberta Utilities Commission Decision 22570-D01- 2018, para. 474:

> *As previously discussed in Section 4, the Commission will not take any guidance from the evidence presented about approved utility ROEs in other Canadian and U.S. jurisdictions. The objective of the GCOC is to consider the market expectation for the affected utilities and not what other regulators are allowing.*

Alberta Utilities Commission Decision 20622- D01-2016, para. 303:

> *The Commission finds that the material presented by Dr. Villadsen in Figure 21 of her evidence simply lists the allowed ROEs and common equity ratios for a sample of U.S. and Canadian utilities. This information does not permit the Commission to address the deficiencies identified in the 2009 GCOC Decision such as applicable legislations and case law, and individual factors specific to the utility, like the business risk of the utility.* (footnote omitted)

**Questions:**

a. Does Nexus agree that as or more important than considering allowed ROEs and ERs in other jurisdictions in determining the appropriate ROE and ER for Ontario's utilities is an examination of Ontario utilities' business risk, and examination of market-based evidence regarding factors that should impact earned ROEs, such as expected future stock market returns, government bond yields, yields on Ontario utility bonds, etc.?

b. Is it Nexus' view that the Alberta Utilities Commission (AUC) is wrong in its findings noted as reference for this question? If yes, please explain the basis for such a view.

**M3-10-AMPCO/IGUA-29**

**Reference:** On page 38, Nexus states (bold added for emphasis):

> *We conclude that benchmarking Ontario to North American electric utilities' authorized ROEs is reasonable because Ontario and US electric service providers compete in the same market for capital*.

**Questions:**

(a) Would Nexus agree that there is a "home bias" among investors, not only from Canada, but also globally. (For example, while Canadian equities generally represent less than 3%

of world stock markets (e.g., 2.9% as of September 30, 2021) Canadian investors (including institutions) had a domestic allocation for equities over 40% in 2020.[1] The home bias is even more dramatic in Canadian fixed income markets, which similarly comprise about 3% of global fixed income markets, but Canadian investors had a domestic allocation for fixed income of approximately 84%.)

If not confirmed, please explain and provide empirical support for any such explanation.

(b) Please confirm that U.S. yields have been higher than Canada yields for several years, and that this is still the case. (For example, as shown in Figure 7 of Dr. Cleary's evidence: the short-term U.S. rates of one year or less were 0.6-0.7% above Canadian rates, while two-year U.S. rates were about 0.8% higher, with 5- and 10-year U.S. yields being about 0.90% higher, and 30-year yields being over 1.1% higher.)

If not confirmed, please explain.

(c) In light of the information cited in questions (a) and (b), does Nexus believe that Ontario utilities would choose to borrow at higher rates in the U.S. and suscept themselves to currency risk, on top of paying higher interest costs? If so, please elaborate on the basis for this belief.

(d) Please provide specific examples over the past five years of Ontario utilities accessing debt and/or equity capital from the U.S. that was of comparable quantity to the amount of debt and/or equity capital that was sourced in Canadian capital markets.

(e) Please provide specific examples over the past five years of U.S. utilities accessing debt and/or equity capital from Canada that was of comparable quantity to the amount of debt and/or equity capital that was sourced in U.S. capital markets.

**M3-10-AMPCO/IGUA-30**

**Preamble:** On page 39, Nexus includes Table 4, which reports "LEI Results as Filed and as Adjusted."

**Questions:**

(a) Please confirm that in the CAPM, the risk-free rate (RF) represents the actual existing risk-free asset that an investor can invest in today (without any risk) and earn the risk-free rate of return. If not confirmed, please explain.

(b) Please explain how a Canadian investor today could buy a 30-year U.S. Government bond promising a "2025 forecast" risk-free rate of return of 4.06%, when available 30-year Canada and U.S. bonds are trading at prices today that do not provide that yield, and given that fluctuations in the Canadian to U.S. dollar exchange rate could impact such a return, if it in fact could be obtained?

(c) Nexus adjusts LEI's CAPM Ke estimate by replacing LEI's RF estimate of 3.19% with Nexus' 2025 forecast for U.S. 30-year Treasury yields, and obtains a "corrected" CAPM

[1] Source: https://www.finiki.org/wiki/Home_country_bias#cite_note-8, September 10, 2022.

estimate that is +0.87% higher than LEI's estimate. Please explain, why a "forecast" of a "U.S." yield (that doesn't exist today), would be a risk-free investment option for a Canadian investor today. Would a Canadian investor not face currency risk for example, not to mention that the "forecast" yield (which is not available today)?

(d) Table 4 reports a "re-levered" estimate of LEI's "rp" Ke estimate. Please provide the details of how Nexus obtained this estimate, including all data, formulae, inputs etc.

(e) Please provide all data and workpapers (in excel format), including all formulae and calculations, used to prepare Table 4.

**M3-10-AMPCO/IGUA-31**

**Reference:** On page 40, Nexus includes Table 5, which reports *"Nexus Economics Cost of Equity Results"*.

**Questions:**

(a) Please explain the justification (and rationale) for Nexus' decision to weight the various Ke estimates according to *"the inverse of the standard deviation of the main result"* as referenced in footnote (b).

(b) Footnote (a) states that all Table 5 Ke estimates are *"relevered to a Debt-to-Equity Ratio of 1.50 and taxes of 25.5%"*. Please provide the details of how Nexus obtained each of the seven Ke estimates it used to determine its weighted average Ke estimate of 11.08% - including formulae, inputs etc.

(c) Please provide all data and workpapers (in excel format), including all formulae and calculations, used to prepare Table 5.

(d) Does Nexus agree that;

i. Regulated operating utilities (such as Ontario utilities) that operate virtual monopolies in well-defined regions with strong regulatory support, low demand risks, and that are able to pass on legitimate costs to consumers would be considered as being less risky than the average company listed in the stock market?

ii. Unlike regulated utilities, average companies listed in the stock market face demand and competitive pressures and input cost risks that they are not able to pass on to consumers, which are risks not faced by regulated utilities?

iii. It is widely accepted among finance professionals that utility stocks are commonly referred to as stocks that are suitable for investors with low risk tolerances?

If Nexus disagrees with any of these assertions, please explain the basis for such disagreement.

**M3-10-AMPCO/IGUA-32**

**Reference:** On page 61, Nexus includes Table 6, which reports *"Firms Included in the Nexus ROE Analysis"*.

**Questions:**

(a) Please confirm that this sample of 43 firms includes only 5 Canadian utilities, and therefore the 38 U.S. utilities comprise 88.4% of the sample. If not confirmed, please explain.

(b) Does Nexus agree that the data provided in Appendix C of Exhibit M4 (Dr. Cleary's evidence) demonstrates that over a long period of time (i.e. more than 25 years), U.S. utility beta estimate historical averages are significantly higher than (i.e. almost double) the comparable Canadian beta estimates, and that this difference is even more pronounced after accounting for the higher leverage of Canadian utilities. If not, please explain.

(c) Does Nexus agree that the Table 8 of Exhibit M4 (Dr. Cleary's evidence) demonstrates that both monthly and weekly beta estimates as of December 31, 2023, and estimates based on the 2017-2023 average estimates for U.S. utilities are higher than the comparable Canadian utility beta estimates. If not, please explain.

(d) Does Nexus agree that the beta estimates provided in Figure 16 of Exhibit M2 (Concentric's evidence) demonstrate that beta estimates for U.S. utilities are higher than the comparable Canadian utility beta estimates. If not, please explain.

(e) Nexus' Table 6 shows that there were no growth forecasts available for three Canadian utilities (Algonquin, Emera, and TransAlta). Please explain if Nexus therefore did not use these Canadian utilities in its DCF analyses. If it did include them, please explain how it determined growth estimates for these three utilities.

(f) Please confirm that if Nexus did not use the three Canadian utilities mentioned in part (e) that the sample it used for its DCF analysis would have consisted of 40 firms, including only 2 Canadian utilities, and therefore the 38 U.S. utilities would comprise 95% of the sample used for its DCF analysis. If not confirmed, please explain.

**M3-10-AMPCO/IGUA-33**

**References:** On page 63, Nexus discusses the market risk premium (MRP) estimates that it uses in its CAPM Ke calculations, and presents some figures in Table 7, which also provides Nexus' MRP estimate of 8.83%.

On page 63, Nexus states (bold added for emphasis):

> *Moreover, at best, the historical average provides an indication of what the future average might be. We are more interested in what the MRP is now than we are in some past average.* ***The average might never be relevant in the future****.*

**Questions:**

(a) Please provide all source documents, as well as workpapers including all data, calculations and formulae (in excel format) that Nexus used to estimate its MRP estimate.

(b) Please confirm that the 116-year historical arithmetic average MRP estimate for Canada is 4.2% over the 1900-2015 period, as reported in Dimson et al. (2016),[2] while the Canadian geometric average is 3.3%. If not confirmed, please explain.

(c) Please confirm that the 116-year historical MRP arithmetic average estimate for the U.S. over the 1900-2015 period is 5.8% as reported in Dimson et al. (2016) over the 1900-2015 period, while the U.S. the geometric average is 4.4% determined in the same study. If not confirmed, please explain.

(d) Please confirm that, as stated on page 122 of Exhibit M1 (LEI's evidence) (bold added for emphasis):

> *… the US MRP recommended by Kroll (formerly Duff & Phelps) has ranged* ***between 5% and 6% since 2008*** *(Kroll has* ***updated the recommended MRP 33 times during this period****).*

Please also confirm that Kroll's recommendations are "forecast" (i.e., future estimate) MRPs that it provides for finance professionals. If not confirmed, please explain.

(e) Please confirm that, as reported in Figure 12 of Exhibit M4 (Dr. Cleary's evidence), the annual survey of global finance professionals (spanning 96 countries in the 2024 survey) which is appended as Attachment BD to Exhibit M4 shows forward-looking MRP estimates that are being used by finance professionals of 5.7%, 6.0% and 5.2% for Canada in its 2022, 2023 and 2024 surveys respectively, and U.S. estimates of 5.6%, 5.7% and 5.5% for 2022, 2023 and 2024 respectively. If not confirmed, please explain.

(f) Please explain why Nexus believes that historical average MRPs are not relevant, whereas the estimated forward MRPs used by finance professionals appear to be very much in line with long-term historical averages.

(g) Please confirm that Nexus estimates its forward-looking MRP of 8.83% using the single-stage DCF Model with an expected dividend yield of 1.25% and an expected long-term growth rate (to infinity) of 11.49%, which translates into an expected market return (Ke) of 12.89%, and that Nexus then subtracts its RF estimate of 4.06% to arrive at a forward-looking MRP estimate of 8.83%. If not confirmed, please correct these statements and explain such corrections as appropriate.

(h) Can Nexus please reconcile such a high predicted growth rate in earnings (and dividends) for Canadian and U.S. companies (of 11.49%) with forecasts for expected nominal GDP growth in Canada and the U.S.?

For example, Concentric forecasts expected nominal GDP growth rate for the Canadian and U.S. economies of 3.84% and 4.04%, while Dr. Cleary provides a similar estimate of 3.9% for Canada based on historical evidence and current surveys of financial institutions. In other words, is it reasonable to expect that Canadian and U.S. corporate profits will grow at an annual average rate of 11.5% (to infinity), despite the respective economies only growing at

[2] This study is included as Exhibit AY of Exhibit M4 (Dr. Cleary's evidence), and is summarized in Figure 12 on page 40 of that Exhibit.

annual rates that are just over one-third of these growth figures at around 4%? If so, please explain the basis upon which Nexus expects this to occur.

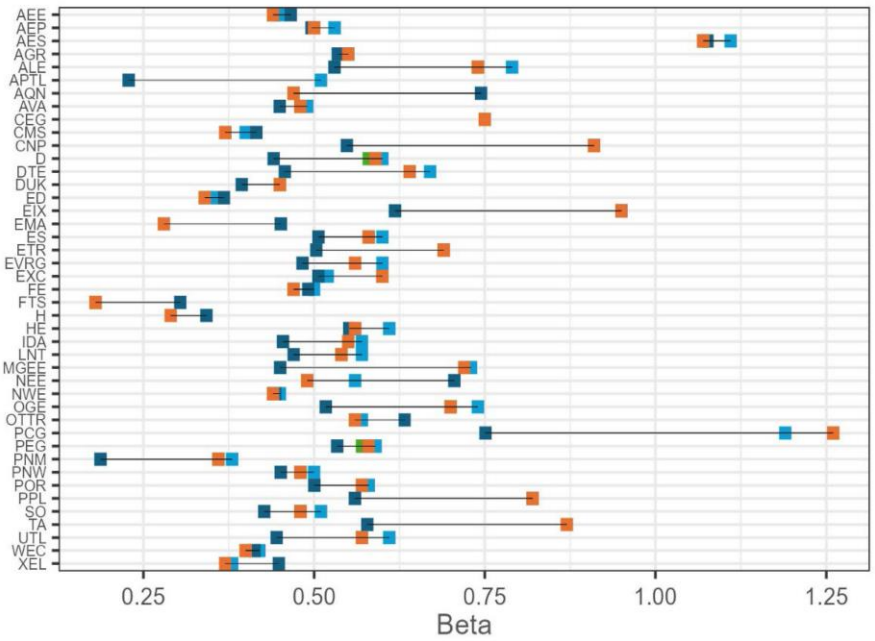
(i) Can Nexus please reconcile such a high predicted expected market return (12.89%) for Canadian and U.S. markets with the long-term forecasts of market professionals for expected market returns of 6.1% for Canada and 6.8% for the U.S., as provided in Table 7 of Exhibit M4 (Dr. Cleary's evidence)? In particular, please explain why Nexus believes that finance professionals that are managing trillions of dollars could be so far off in their estimates (i.e., 12.89% is more than double both the 6.1% estimate for Canada and the 6.8% estimate for the U.S.

**M3-10-AMPCO/IGUA-34**

**References:** On pages 64-69, Nexus discusses its beta estimate it uses in its CAPM Ke calculations, and its final CAPM Ke estimates.

Page 66 includes Figure 9, which is reproduced below:

*Figure 9 – Betas as Obtained from Different Sources*




On page 68, Nexus states:

*The overall average of our relevered (and Blume-Adjusted) betas is 0.7037.*

Evidence supporting the fact that utility betas do not gravitate towards one:

Michelfelder and Theodossiou (2013) show empirically that utility betas do not have a tendency to converge to 1.0 and concluded that the adjusted betas as reported by Value Line are not applicable for public utilities.

- As shown in Appendix B of Exhibit M4 herein (Dr. Cleary's evidence), Sikes (2022) provides a chart in Figure IV of his report that estimates betas for utilities over the 1970-2020 period (i.e., using over 50 years of observations) that leads Sikes to note (on page 48 of his report) that: "It is undeniable based on Figure IV that the Value Line Adjustment is inappropriate. Clearly, utility betas have been consistently below 1.0 and as shown in Exhibit H of the Appendix, the historical sample suggests an average of 0.55." In fact, the line depicting adjusted betas in Sikes' Figure IV is ALWAYS above the line depicting actual betas – which clearly shows that adjusted beta estimates are upwardly biased.

- Exhibit M4, Appendix B shows that over the historical raw Beta estimates for Canadian Utilities over the 1995-2019 period averaged 0.40 (weekly data) and 0.34 (monthly data), with maximums of 0.71 and 0.62 respectively and nowhere during this 25-year period did the Canadian Utility beta estimates even come close to 1.0.

- Exhibit M4, Appendix B shows that over the historical raw Beta estimates for U.S. Utilities over the 1995-2019 period averaged 0.49 (weekly data) and 0.42 (monthly data), with maximums of 0.84 and 0.85 respectively and nowhere during this 25-year period did the U.S. Utility beta estimates even come close to 1.0.

**Questions:**

(a) Please confirm whether the beta estimates depicted in Figure 9 are "raw" betas or "adjusted" betas.

(b) Please provide the percentage of beta estimates depicted in Figure 9 that are:

(i) Below Nexus' beta estimate of 0.7037
(ii) Below 1.0 (i.e., the beta used in the Blume Adjustment formula)
(iii) Below 0.75
(iv) Below 0.5

(c) Please provide all supporting data and worksheets (in excel format), with all accompanying formulae used to construct Figure 9.

(d) Given the evidence cited above that utility betas do not gravitate to one (or that utility sample averages never get close to one) please explain the rationale for Nexus' reliance on upwardly biased adjusted beta estimates.

**M3-10-AMPCO/IGUA-35**

**Reference:** On pages 69-72, Nexus discusses its DCF Ke estimates.

In this section, Nexus discusses its DCF approach, but does not provide any details regarding how it obtained its DCF estimates and simply states on page 71 that its DCF estimate is 10.92% before adjusting for flotation costs.

**Questions:**

(a) Please provide all data and workpapers (in excel format), including all formulae and calculations, used to prepare Figure 10 (page 71).

(b) Please report the following information that Nexus used in obtaining its DCF estimates:

i. The dividend yields used for each of the following DCF estimates it provides in Table 9 on page 74: Lower Confidence Limit; Average; and, Upper Confidence Limit.

ii. The long-term growth rates (to infinity) used for each of the following DCF estimates it provides in Table 9 on page 74: Lower Confidence Limit; Average; and, Upper Confidence Limit.

(c) Please provide all data and workpapers (in excel format), including all formulae and calculations, used to determine the DCF estimates Nexus reports in Table 9 on page 74.

(d) Please confirm that using a long-term growth rate in the Constant-Growth DCF model assumes that this growth rate persists to infinity, and not just for a period of 10 years or less. If not confirmed, please explain.

**M3-10-AMPCO/IGUA-36**

**References:** On pages 72-73, Nexus discusses the results of what it refers to as its *"risk premium method"*.

In its 2018 GCOC Decision (Decision 22570-D01-2018, paras. 392-393), the Alberta Utilities Commission (AUC) concluded that (bold added for emphasis):

> *The BYPRPMs of Mr. Hevert and Mr. Coyne estimate the risk premium component by comparing the approved ROEs to the long-term government bond yields in place at the time, thus capturing the inverse relationship. However, the Commission* ***has two concerns*** *with Mr. Hevert's and Mr. Coyne's approach. First, because their models estimate the risk premium in excess of long-term government bond yields, i.e., the risk-free rate****, they lose the advantage of incorporating the observable market data on utilities' credit spreads****, as compared to Dr. Cleary's approach.*
>
> *Second, these models* ***use the approved ROEs of other regulators in the U.S. as proxies for the market return****. In the Commission's view, although observable, the ROEs approved for the U.S. utilities are* ***not strictly market data****. Accordingly, the main assumption of these models, that the approved ROEs represent market return, does not hold, because*

*the approved ROEs would be heavily influenced by the ROEs awarded by other regulators.*

**Questions:**

(a) Does Nexus agree with the AUC's concerns that using government bond yields loses the advantage of incorporating the observable market data on utilities' credit spreads? If not, please explain why not.

(b) Does Nexus agree with the AUC's concerns that approved ROEs are not strictly market data, and are heavily influenced by ROE's awarded by other regulators? If not, please explain why not.

(c) Would Nexus agree that allowed ROEs in the U.S. do not account for issues such as jurisdiction-specific legislation and case law, nor do they reflect Ontario utility-specific business risks? If not, please explain why not.

(d) Please provide all data sources, all data and the workpapers (in excel format), including all formulae that Nexus used to conduct its "risk premium method" analysis.

(e) Please provide the entire regression output, including R-squared values, etc.

(f) What jurisdictions did Nexus examine, and over what time period?