

2024 REVIEW OF COST OF CAPITAL PARAMETERS AND DEEMED CAPITAL STRUCTURE

EB-2024-0063

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Presentation Outline

1. ROE Matters
 - a. Final Cost of Equity (K_e) Estimates and Expected Market Returns
 - b. Some Notes on Allowed ROEs
 - c. Base ROE Estimates
 - i. CAPM Estimates
 - ii. DCF Estimates
 - iii. BYPRP (and other Risk Premium) Estimates
 - d. LCBF and UtilSpread Factors in the OEB ROE Formula
 - i. Estimation
 - ii. Adjustment Factors
2. Allowed Equity Ratios

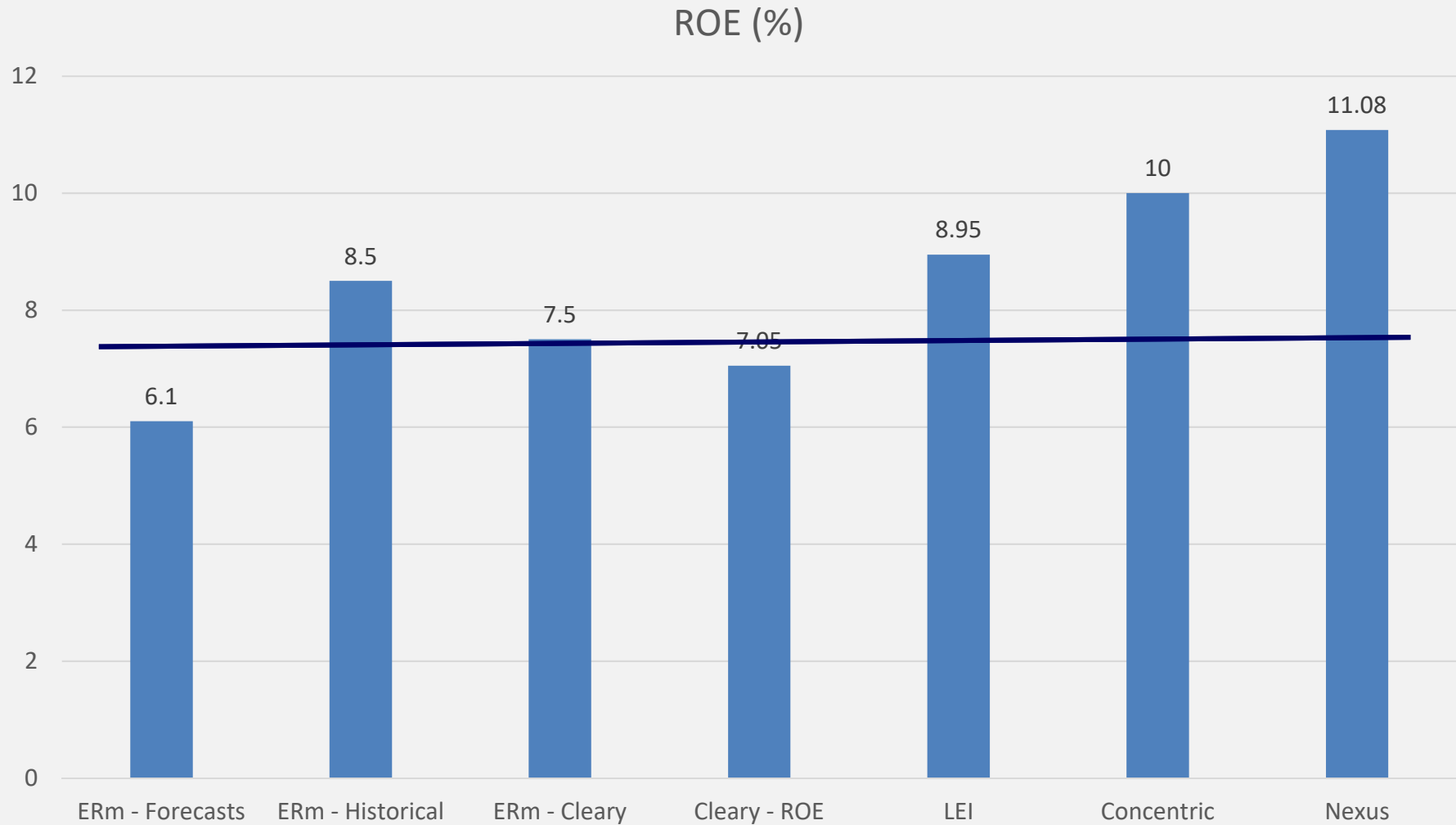


ROE Recommendations

- There is general acceptance that **utility companies are less risky than the average company in the market as a whole.**
- This implies the long-term expected return on the market (**ER_m**) is **a clear upper bound**, for the establishment of a just and reasonable ROE for regulated Ontario operating utilities, which are clearly below-average risk companies.
- Table 7 of my evidence provides estimated long-term market returns from a number of important and reputable sources with various mandates:
 - The Canadian market nominal estimates range from 5.6% to 7.3%, with **an average of 6.1%**. The U.S. numbers are similar, ranging from 5.4-7.4%, with an average of 6.8%.
 - Having regard to these market forecasts, as well as historical evidence, I conclude that **7.5%** is an appropriate estimate for expected long-term Canadian stock market returns.



ROEs for Regulated Ontario Operating Utilities





Recommendations and Allowed ROEs Elsewhere

- Concentric's ROE and ER recommendations appear to rely **almost exclusively** on the main argument that since allowed ROEs and ERs in the U.S. are higher than those for Ontario utilities, the allowed ROEs and ERs need to be increased (i.e., 25 such references to U.S. ratios and 14 to NA and Canadian ratios).
- Nexus similarly supports its ROE and ER recommendations (on page 22 of its evidence), which suggests that Nexus believes that Ontario deemed ROEs and ERs need to be increased **primarily on the basis that they should be better aligned with much riskier U.S. utilities** (in three U.S. jurisdictions), since Nexus' evidence suggests that Ontario ROEs and ERs are in line with those deemed in the two Canadian jurisdictions it examined.

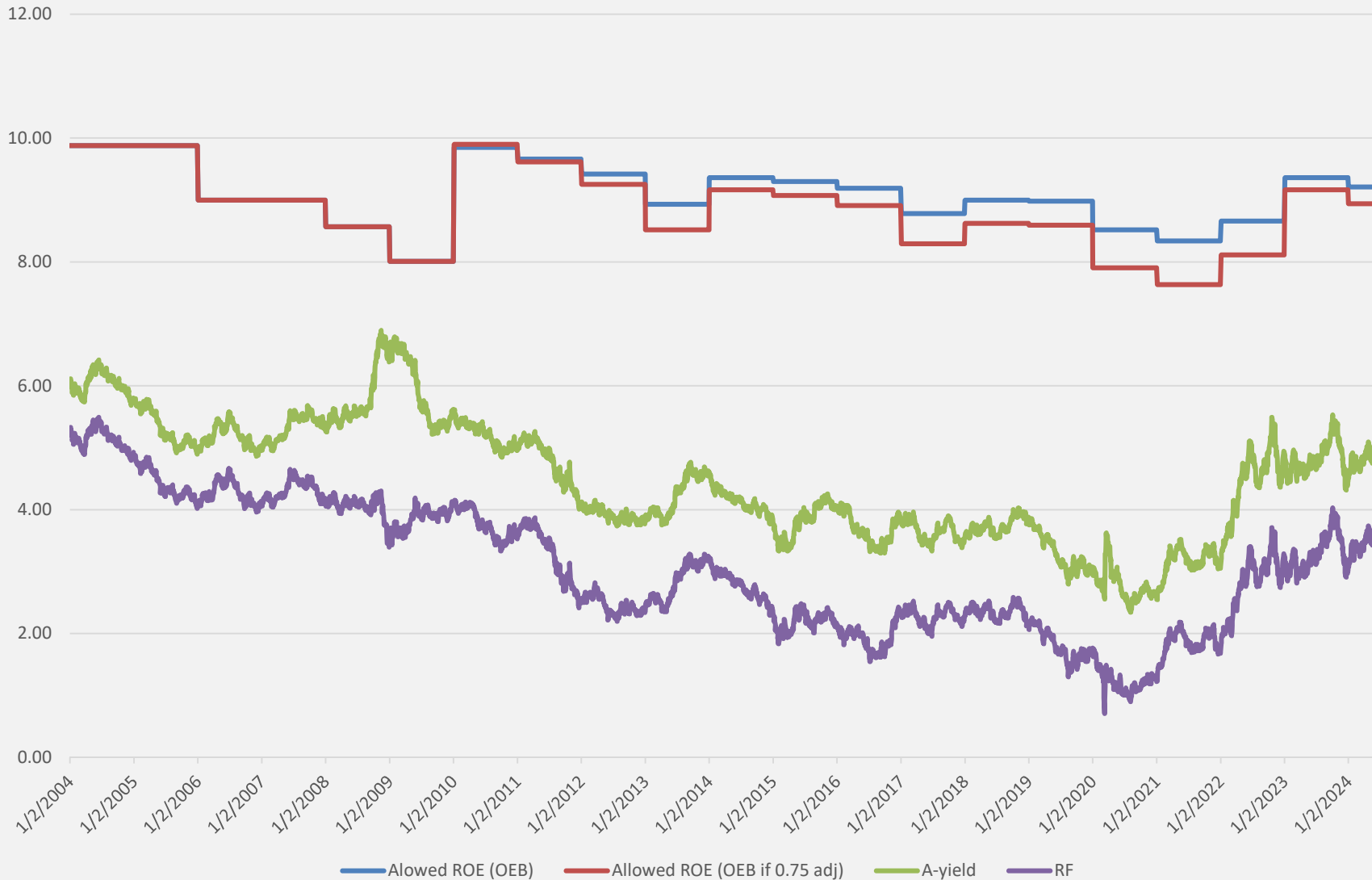


Concentric ROE Recommendations

- November 7, 2023 – Newfoundland Power (NP) proceedings:
 - Concentric recommended allowed **ROE of 9.85%** / allowed ER of **45%**, **similar to** its current recommendations for Ontario utilities of **10% / 45%**.
 - Despite Concentric’s arguments that **NP faces significant risks** due to:
 - its small size
 - weak macroeconomic and demographic conditions in Newfoundland (which is not the case for Ontario)
 - potential issues with future demand and slow potential for growth in customer demand (while in contrast, Concentric argues that increased demand for Ontario utilities is a risk to them)
- February 1, 2023 - Alberta GCOC proceedings:
 - Concentric recommended an allowed **ROE of 9.5%** and an allowed **ER of 40%**, (both recommendations **well below** its current recommendations for Ontario utilities)
 - In Alberta, Concentric stated these recommendations were based on bringing Alberta utilities **in alignment with “the deemed equity ratios of comparable-risk electric utilities in Ontario** and elsewhere across Canada.”



Allowed ROEs Since 2004 - Figure 9





Allowed ROEs Since 2004

- Section 5.1 of my evidence shows that since 2004, both government yields (RF) and A-rated utility yields have declined markedly, while the allowed ROEs have declined much less so over this period. As a result, the spreads between allowed ROEs and these yields, both of which directly affect the utilities' cost of capital, have **increased** dramatically through the years.
- January 2004: the allowed ROE by the OEB was 9.88%, RF was 5.3% and A-rated utility yields were 6.1%. So, the spread between the allowed ROE and RF was **4.57%**, and between ROE and A yields was **3.78%**.
- June 5, 2024: the allowed ROE was only **0.67% lower** than in 2004 at 9.21%, while RF was **2.0% lower** at 3.30%, and A yields were **1.42% lower** at 4.68%. As a result, the ROE-RF spread was 1.34% higher than in 2004 at **5.91%** (a 29% increase), while the ROE-A yield spread was 0.75% higher at **4.53%** (a 20% increase).
- The average ROE-RF spread during the January 2004-June 2024 period was **6.03%** and the average ROE-A-yield spread was **4.61%**.



Allowed ROEs Since 2004 (cont'd)

- Section 5.1 shows:
 - the allowed ROEs in Canada **have not declined in line with reductions in government and utility bond yields** (both of which influence their cost of capital), and hence are providing Ontario (and Canadian and U.S.) utilities “excess compensation” in terms of allowed ROEs relative to their actual market-determined cost of equity.
 - the downward “stickiness” in awarded ROEs is **not unique to Ontario** but can be observed in other Canadian jurisdictions, and is **even more prevalent in the U.S.:**
 - Azgad-Tromer and Talley (2017) conclude awarded ROEs are too high based on an examination of U.S. decisions over 2005-2016.
 - Sikes (2022) similarly shows that the average U.S. awarded ROE is much greater than the average utility’s cost of equity.



Inflated Allowed ROEs and P/B Ratios

- Inflated ROEs in Canada and the U.S. are reflected in their recent price-to-book (P/B) ratios, as discussed in Section 5.5 of my evidence.
- The “**market-determined**” **P/B ratio** for Canadian publicly traded utilities averaged **1.65** over the 2017-2023 period, with the 2023 average sitting at **1.45**.
- Generally speaking, firms that have P/B ratios greater than one are earning (and expected to earn) rates of return that are at least “fair,” if not above fair (i.e., $ROE > K_e$, since technically P/B should equal 1 if $ROE = K_e$, and **if they exceed one it indicates they are earning excess economic rent**).
- The sole publicly-listed regulated operating Canadian utility (Hydro One) had a P/B ratio of **2.04** as of the end of 2023.
- The average P/B ratio for the U.S. sample was greater than the Canadian average every year, ranging from 1.69 to 2.36 and averaging **2.05** over the 2017-2023 period – consistent with the observation that allowed ROEs in the U.S. are even more upward biased than those in Canada.



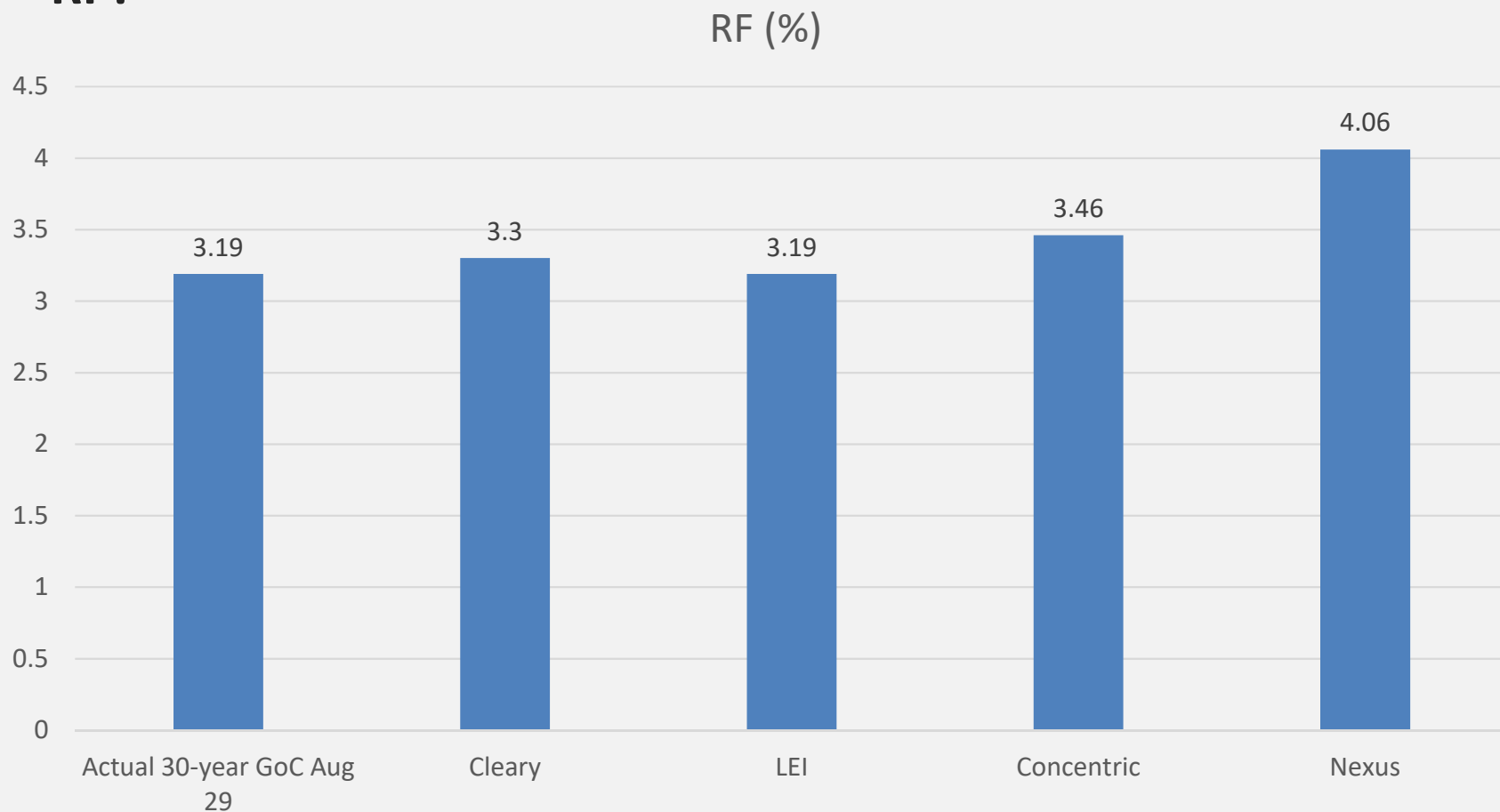
Heavy Reliance on U.S. Comparators

- LEI – Generation – **83%**
- Concentric – **76%**
- Nexus – **88%**
- **However:**
 - Appendix B of my evidence shows that U.S. utilities are not reasonable comparators since they possess **higher business risk** than their Canadian counterparts.
 - Appendix C of my evidence shows that over a long period of time (i.e., more than 25 years), U.S. utility beta estimate historical averages are **much, much 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.



CAPM Cost of Equity (Ke) Estimates

- $Ke = RF + (Erm - RF) \times Beta$, or **$Ke = RF + MRP \times Beta$**
(i.e., 3 inputs to be estimated)
- **RF?**



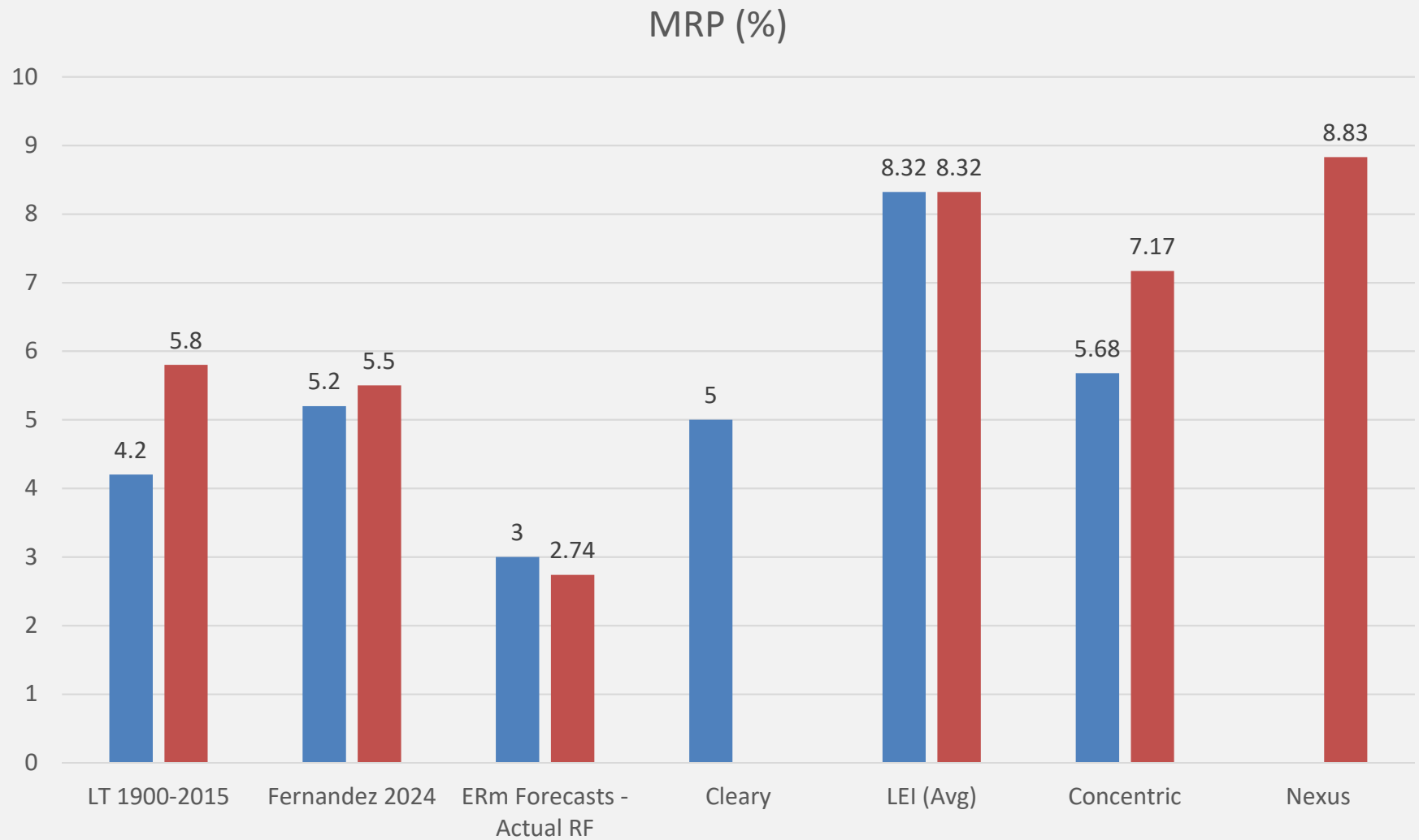


RF Estimates

- **Cleary:** 3.30% was the **actual** 30-year GoC yield (June 5/24)
- **LEI:** 3.19% is the average of 30-year GoC **forecasts**
- **Concentric:** 3.46% is the Consensus 10-year GoC **forecast** average + **0.33%** (historical 30-10yr spread – which was negative at the time).
- **Nexus:** 4.06% is the average of 30-year **U.S. Treasury yield forecasts**
- Issues with using “forecasts”:
 - in the CAPM, RF represents the **actual existing risk-free asset that an investor can invest in today** and earn the risk-free rate of return. Therefore, it would not be possible for a Canadian investor today to buy a “forecast” yield that isn’t available today.
 - **U.S. bonds not appropriate** for Canadian investors (home bias) plus they entail F/X risk.
 - as discussed in detail in Section 3.7 and in Appendix A of my evidence, **using actual prevailing yields provides statistically significantly better forecasts**, than using forecast yields (which displayed a **+0.40% upward estimate bias**).



MRP Estimates



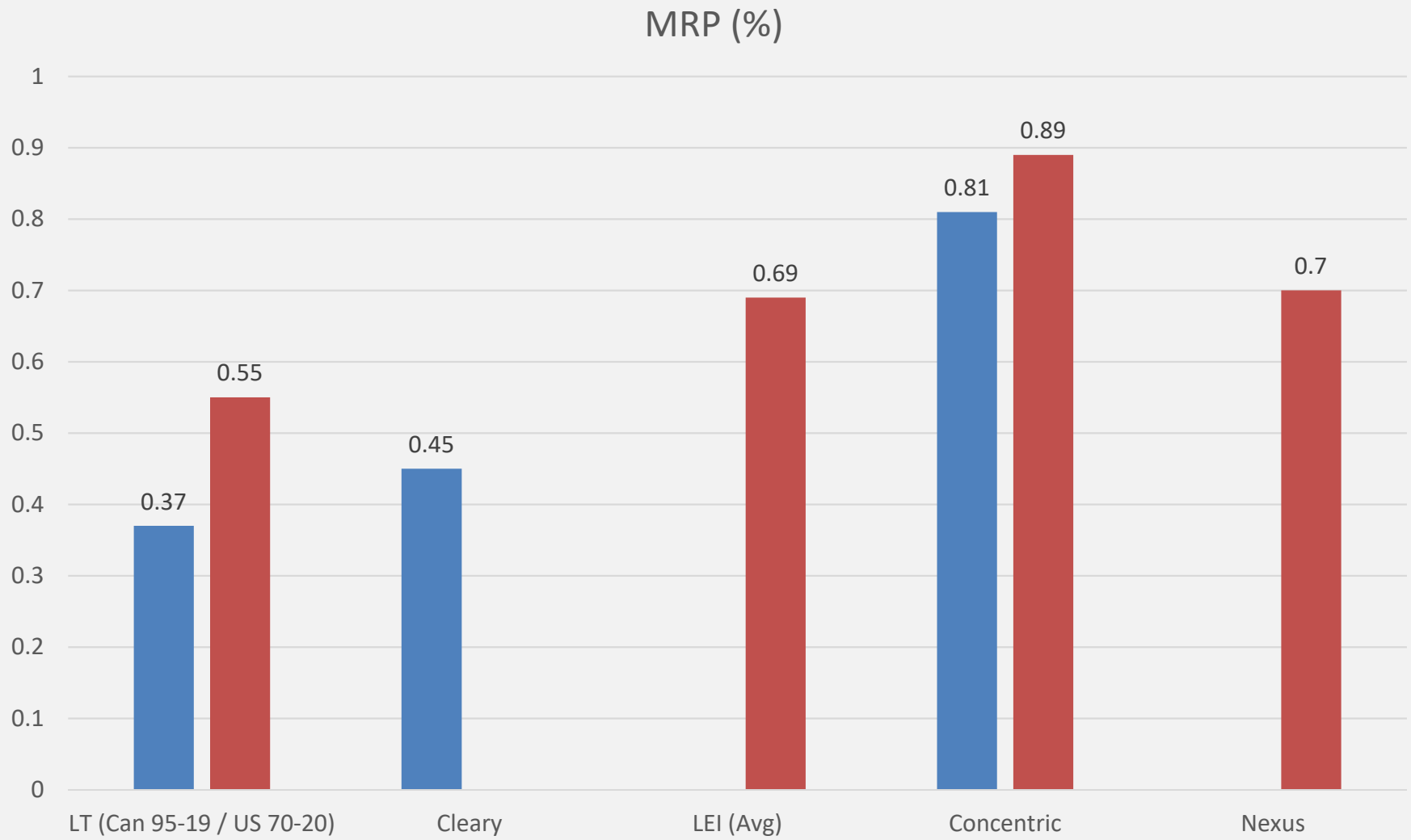


MRP Estimates

- **Cleary: 5% - Canadian MRP, which is appropriate for Canadian investors (home bias and no F/X risk).** 5% is consistent with common practice (4-6%), as well as LT averages (4.2%), current MRP forecasts (5.2%) and current ERm forecasts of 6.1% (implying MRP = 3%).
- **LEI: Average MRP of 8.32%** is based on **U.S. historical evidence** over short time periods, and triple weights the most recent period.
- **Concentric:** Historical Canadian MRP of **5.68%** and U.S. of **7.17%** are flawed and inconsistent with historical data to the use of “**income only**” **bond returns** instead of total yield (which is the appropriate approach and is common practice). Concentric correctly disregards its “forward-looking MRPs which are flawed by the use of unrealistically high growth rates for Index companies in single-stage DCF estimates.
- **Nexus:** Relies on its estimate of a **forward-looking U.S. MRP of 8.83%** using the single-stage DCF Model with an expected long-term growth rate (to infinity) of **11.49%**, which assumes that the expected profits and dividends of North American utilities will grow (to infinity) at rates that are almost triple forecasts of expected nominal GDP growth rates (of approx. 4%).



Beta Estimates

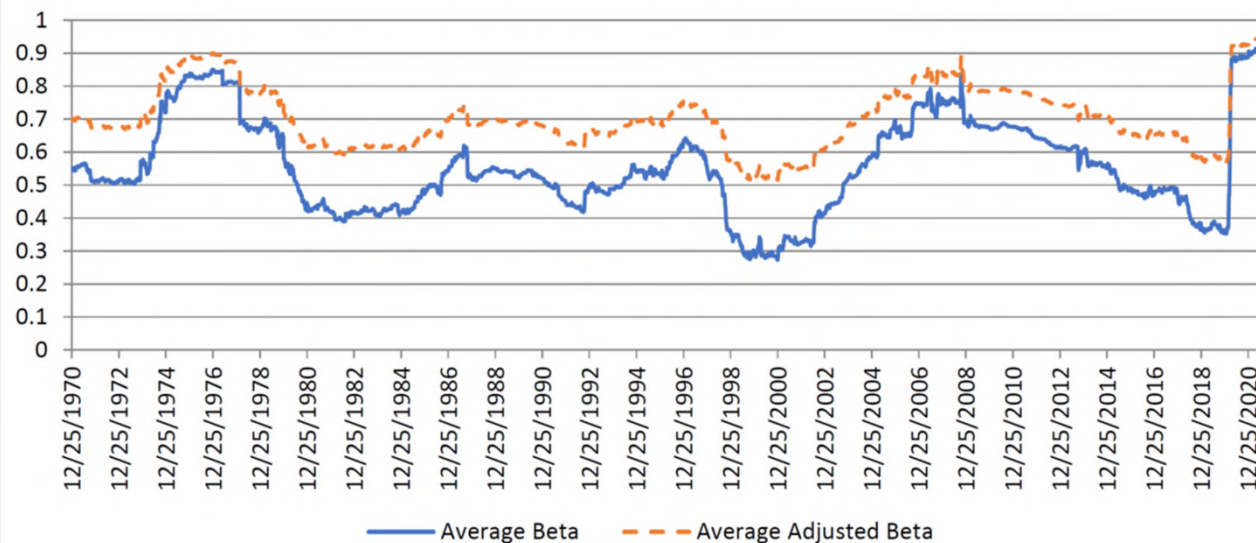


Beta Estimates

Figure 6: Comparison of Historic 5-Year Monthly and Weekly Betas¹³⁶
Panel A: Simple Average of Booth's Major Canadian Utility Holding Companies



Figure IV: Average Beta vs. Average Adjusted Beta





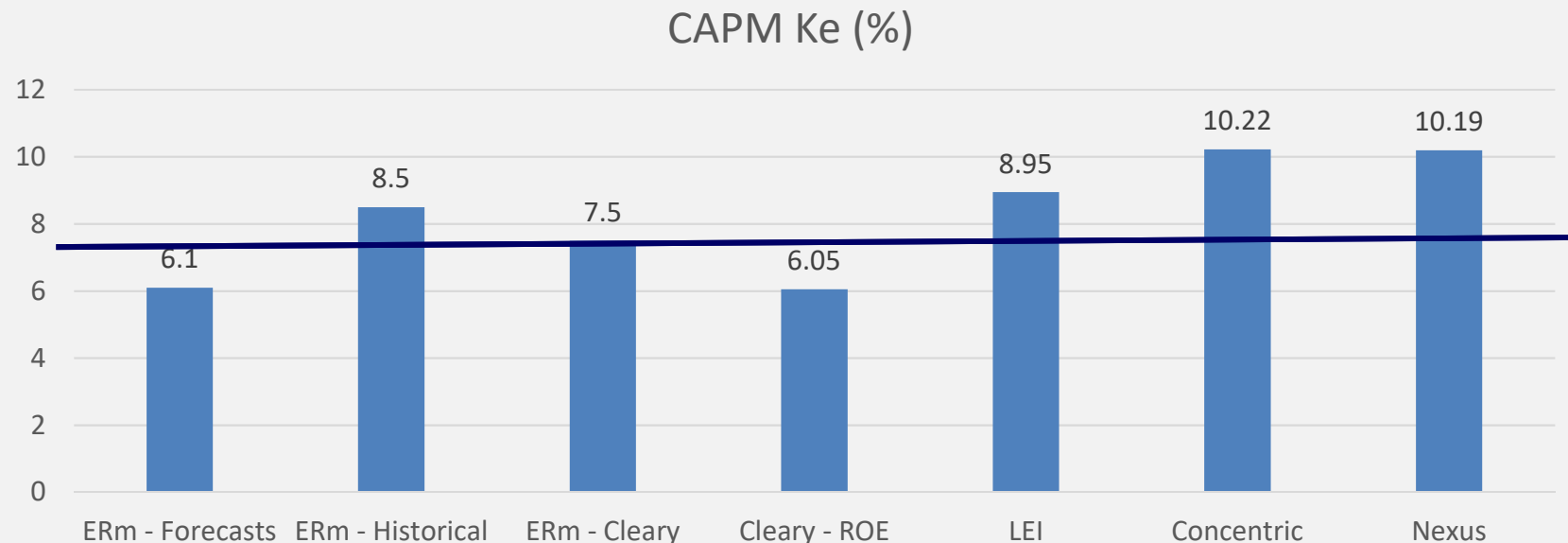
Beta Estimates

- **Cleary:** 0.45 – based on long-term averages for Canadian utilities plus judgment, after considering current beta “estimates.”
- **LEI:** 0.69 – sample puts 83% weighting on U.S. utilities, which are higher. LEI uses raw betas then unlevers the beta estimates, then relevers them.
- **Concentric:** 0.89 – NA – 76% weighting on U.S. beta estimates. Use adjusted betas despite strong evidence showing **that utility betas do not gravitate towards one.**
 - Michelfelder and Theodossiou (2013)
 - Appendix B of my evidence – U.S. beta estimates - Sikes (2022)
 - Appendix B of my evidence – Canadian beta estimates 1995-2019
- **Nexus:** 0.70 – NA – 88% weighting on U.S. beta estimates. Use adjusted betas despite strong evidence showing that utility betas do not gravitate towards one



Final CAPM Ke Estimates

- $Ke = RF + MRP \times \text{Beta}$
- Other experts have **inflated Ke estimates** (all >> ERm) due to inflated estimates of:
 - RF (Nexus – using U.S. forecasts)
 - Beta (U.S. weighting + adjusted betas for Concentric and Nexus)
 - MRP (U.S. MRP estimates, forecast MRPs using unreasonable growth rates in market DCF + historical MRPs using income only yields (Concentric))





DCF Ke Estimates

- **Single-Stage Ke = $D_0/P_0 + g$**
- Where D_0/P_0 = lagged dividend yield,
- g = annual growth rate in dividends (and earnings) **to ∞**
- **Cleary:** $g = 1.80\%$ average for **Canadian sample** (U.S. - 3.15%), based on **sustainable growth rate** [i.e., $g = (1 - \text{Payout})(\text{ROE})$] –which is standard practice by analysts, in almost every finance textbook (including mine), and in CFA curriculum – Nexus uses in its MRP estimates also.
- **LEI, Concentric, Nexus:**
 - **Heavy focus on U.S. utilities** – 83% , 76% and 88% respectively
 - Use **sell-side analyst growth forecasts**
- Analyst forecasts are known to be overly optimistic – e.g., Easton and Sommers estimate the “optimism” bias in analysts’ growth forecasts **inflates final DCF cost of equity estimates by an average of 2.84% .**



“g” Estimates

- Long-term (i.e., to ∞) “g” estimates used in single-stage DCF:
 - LEI: **10.26%, 6.41%, and 6.34%** / Concentric: NA – **5.98%** / Nexus: NA – **6.31%**¹
- These long-term growth estimates are unreasonable, as they assume that the dividends and earning of mature low-growth operating utilities will **grow at rates that exceed nominal GDP growth** (e.g., Concentric GDP growth estimate for NA = **3.99%**, Cleary for Canada = **3.9%**):
 - As stated in the 2018 Alberta GCOC Decision (Decision 22570-D01-2018, para. 438) (bold added for emphasis, footnote omitted):
 - “438. With respect to the single-stage DCF model estimates presented by Dr. Villadsen, Mr. Coyne and Mr. Hevert, the growth rates used by each of these three witnesses in their single-stage DCF models are in **excess of the long-term GDP growth estimates** they put forward. Consistent with its determinations in prior GCOC decisions, **the Commission will not accept, in a single-stage DCF model, the use of long-term or terminal growth rates that exceed estimates of the nominal long-term GDP growth rate for the economy.** The Commission recognizes that the utilities are, as Dr. Cleary stated in his evidence, **essentially monopolies in mature markets** and, because of this, the **use of long-term growth in excess of the long-term growth of GDP is unreasonable.**”

¹ It is not possible for me to determine exactly what “g” or DY Nexus used, since it did not provide any details supporting its DCF Ke estimates (which are all based on using the Single-Stage DCF model) in its evidence. And when asked to do so in M3-10-AMPCO/IGUA 35(a) and (b), the response to (a) referred to some “source code” that was meaningless to me, and the response to (b) referred to an excel file that does not report the average “g” or “DY” figures used by Nexus. However, it is reasonable to assume that the long-term growth rates were over 6% annually, using Concentric’s estimated dividend yield of 4.61% for its North American proxy group (which is heavily weighted in U.S. utilities, similar to Nexus’s sample). In other words, I use the number above as an estimate obtained using Nexus’ Ke estimate of 10.92% = 4.61% (DY) + g, so g = 6.31%.



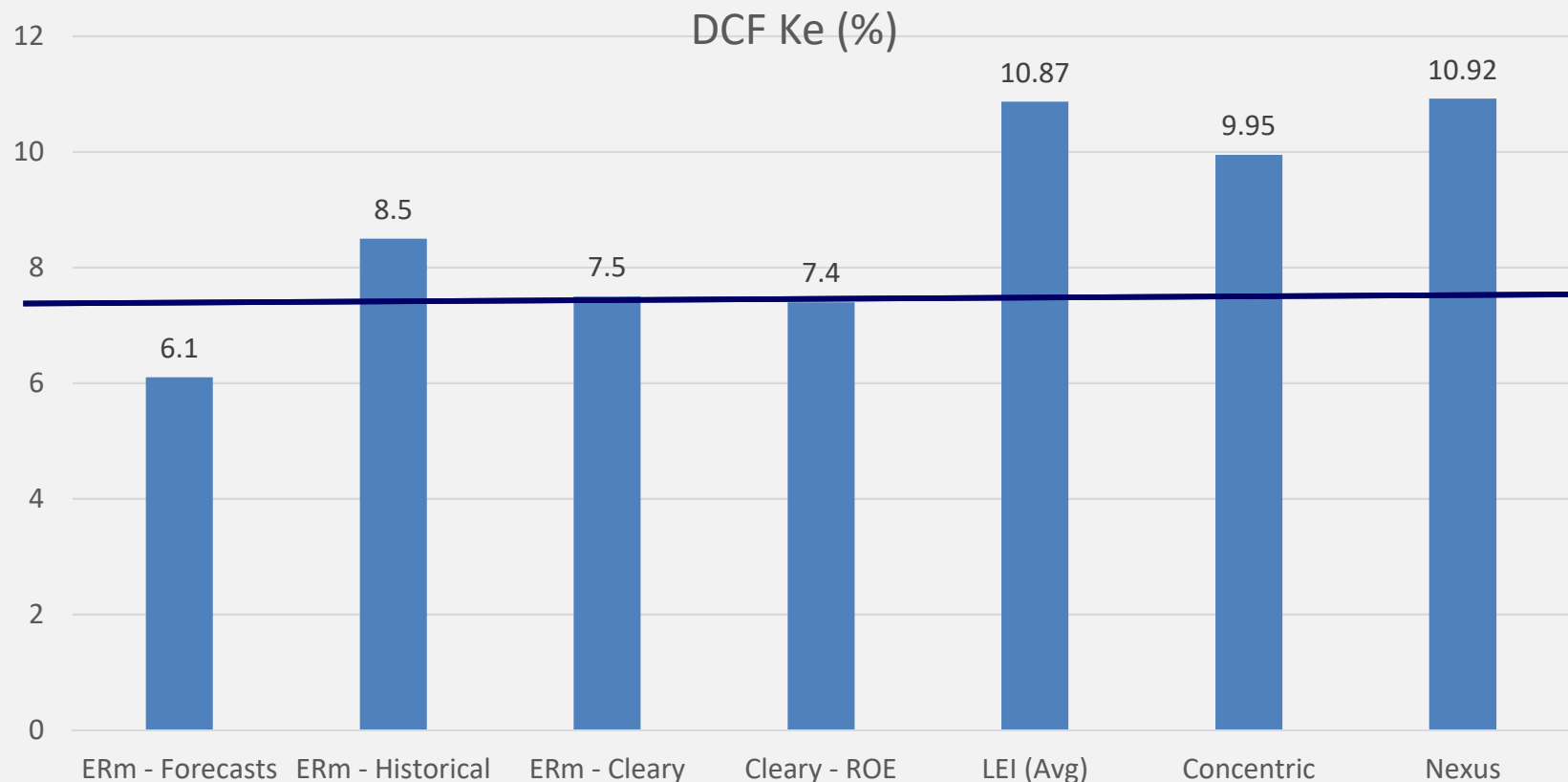
Multi-Stage DCF Ke Estimates

- **Cleary:** uses the H-Model, assuming either **two or four years** before short-term growth gravitate linearly to a long-term growth rate (to ∞).
- **LEI and Nexus:** do NOT provide any multi-stage DCF estimates.
- **Concentric:** In its multi-stage DCF model (upon which it places 100% weight for its DCF estimate), it assumes that the higher analyst growth rates (i.e., above expected nominal GDP growth) exist **for a full 5 years**, then gradually decline over the **following 5 years** to a stable long-term growth rate equal to its estimate of long-term nominal GDP growth. Therefore, this approach also assumes that utilities' earnings and dividends will **grow at rates above nominal GDP growth for 10 years, then will grow at estimated nominal GDP growth from year 11 to infinity**. Therefore, these estimates should be disregarded, like Concentric's single-stage DCF estimates.



Final DCF Ke Estimates

- Other experts have **inflated Ke estimates** (all >> ERM) due to heavy weighting of U.S. utilities, and the use of inflated analyst growth forecasts (which exceed expected nominal GDP growth).





Cleary BYPRP Model Ke Estimates

- Bond Yield Plus Risk Premium (**BYPRP**) model, specified as:
$$K_e = \text{Company Bond Yield} + \text{Risk Premium (company-specific)}$$
- $K_e = 4.7 + 2.5 = 7.2 + 0.5 \text{ (flot. costs)} = \mathbf{7.7\%}$
- This model adds an estimated risk premium to the **market-determined yield** on a firm's outstanding publicly-traded long-term bonds. This approach forms part of the CFA curriculum, is found in numerous academic textbooks, and is widely used by both financial analysts and CFOs.
- As the AUC has previously recognized, this model is simple to use, incorporates readily observable, market-determined credit spreads, and “**conforms to the basic principle that investors require a higher return for assets with greater risk**”.
(AUC Decision 22570-D01-2018, paras. 388-389.)



Other Risk Premium Model Ke Estimates

- **LEI:** equity risk premium (ERP) approach:
- Use 3.15% as the LCBF (based on March 2024 forecast long-term Canada yields)
- Add to this LCBF an ERP of 5.5%, to estimate $K_e = 3.15 + 5.5 = 8.65\%$.
- The ERP of 5.5% is determined using the mid-point of the average of the 2001-24 actual returns on the S&P/TSX Index (of 6.77%), and the average returns on the BMO equal weight utilities index (of 10.98%).
- Issues:
 1. Historical evidence is over a short time period, and hence may not always provide reliable estimates of **future returns**.
 2. Not sure that the BMO utilities index is an appropriate measure.



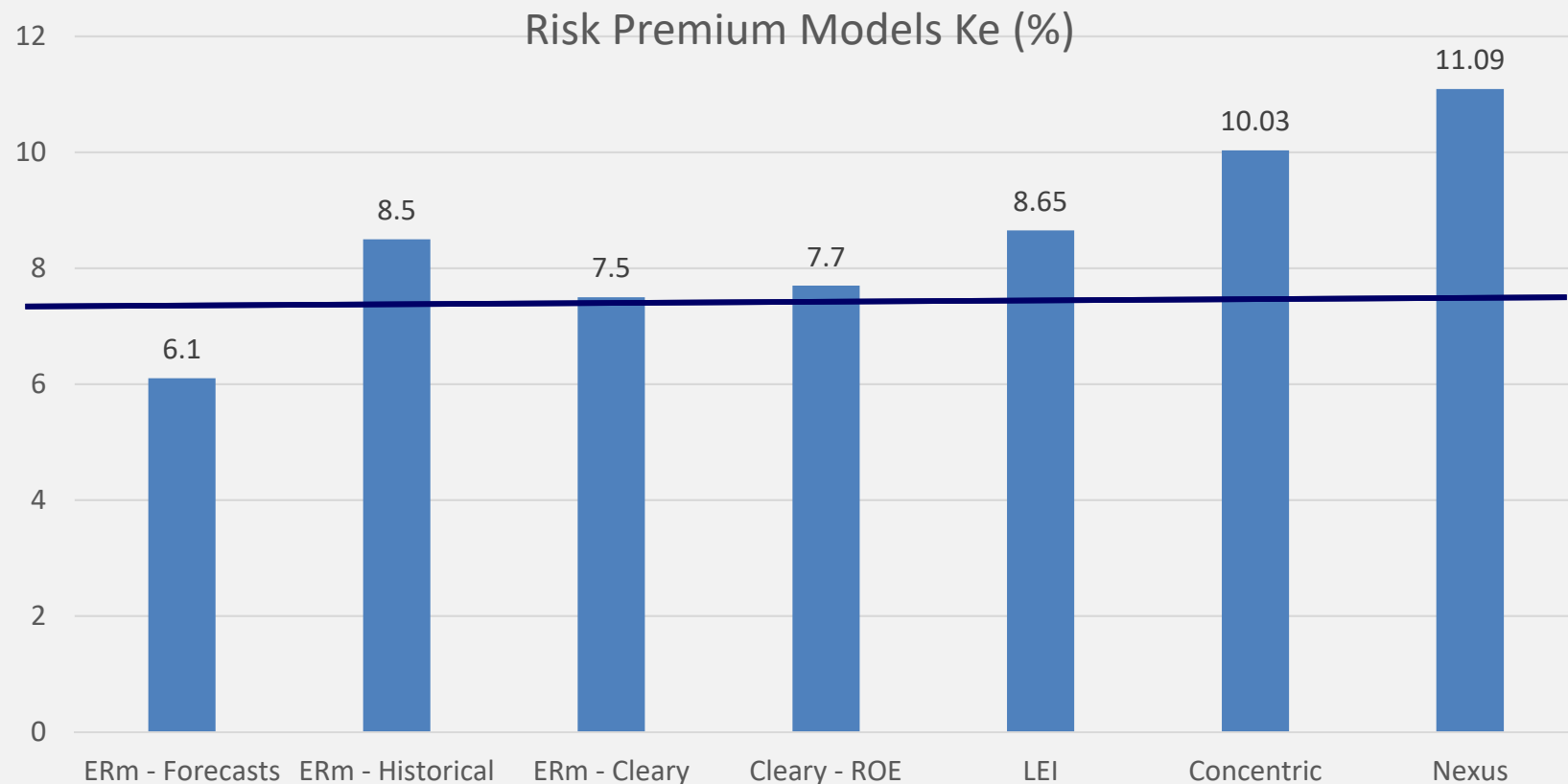
Other Risk Premium Model Ke Estimates (cont'd)

- **Concentric (10.03%) and Nexus (11.09%) Risk Premium Models:**
- Based on the results of multivariate regressions of **U.S. allowed ROEs on U.S. government bond yields and U.S. corporate bond yield spreads.**
- Results are **simply not relevant** with respect to **current capital market conditions in Canada** that are intended to be reflected in the cost of equity to Ontario utilities and/or the OEB's ROE formula, as captured by changes in LCBF and UtilBondSpread.
- Allowed ROEs in U.S. jurisdictions **do not have a direct relationship with changes in capital market conditions in Canada.** These:
 - do not change frequently (only during ROE reviews or annually at best if the jurisdiction uses a formula), unlike the LCBF and UtilSpread factors which change daily.
 - have no direct relationship to Canada government yields (which often differ from U.S. yields as they do today) or with Canadian yield spreads.
- As the AUC stated in Alberta 2018 GCOC Decision 22570-D01-2018, para. 393 (emphases added): "In the Commission's view, although observable, the **ROEs approved for the U.S. utilities are not strictly market data.**"



Risk Premium Model Ke Estimates

- Concentric and Nexus have flawed and **inflated Ke estimates** (**all >> ERm**) due to the use of U.S. yield data, and even more so on the reliance on allowed ROEs in U.S. jurisdictions (which is **not market data**)





LCBF and UtilSpread Estimates

- **Cleary:** Use the **Sept. 30 “actual” GoC yield** to estimate LCBF, and the **actual A-rated utility spread as of Sept. 30** to estimate UtilSpread.
- **LEI:** Use the **average of 30-year GoC forecasts** to estimate LCBF, and use a **12-month trailing average** to estimate UtilSpread.
- **Concentric:** Use 75% of the average of **30-year GoC forecasts** plus 25% of a **30-day average** actual GoC yields (as of Sept. 30) to estimate LCBF (i.e., Alberta current practice), and use a **90-day average** to estimate UtilSpread.



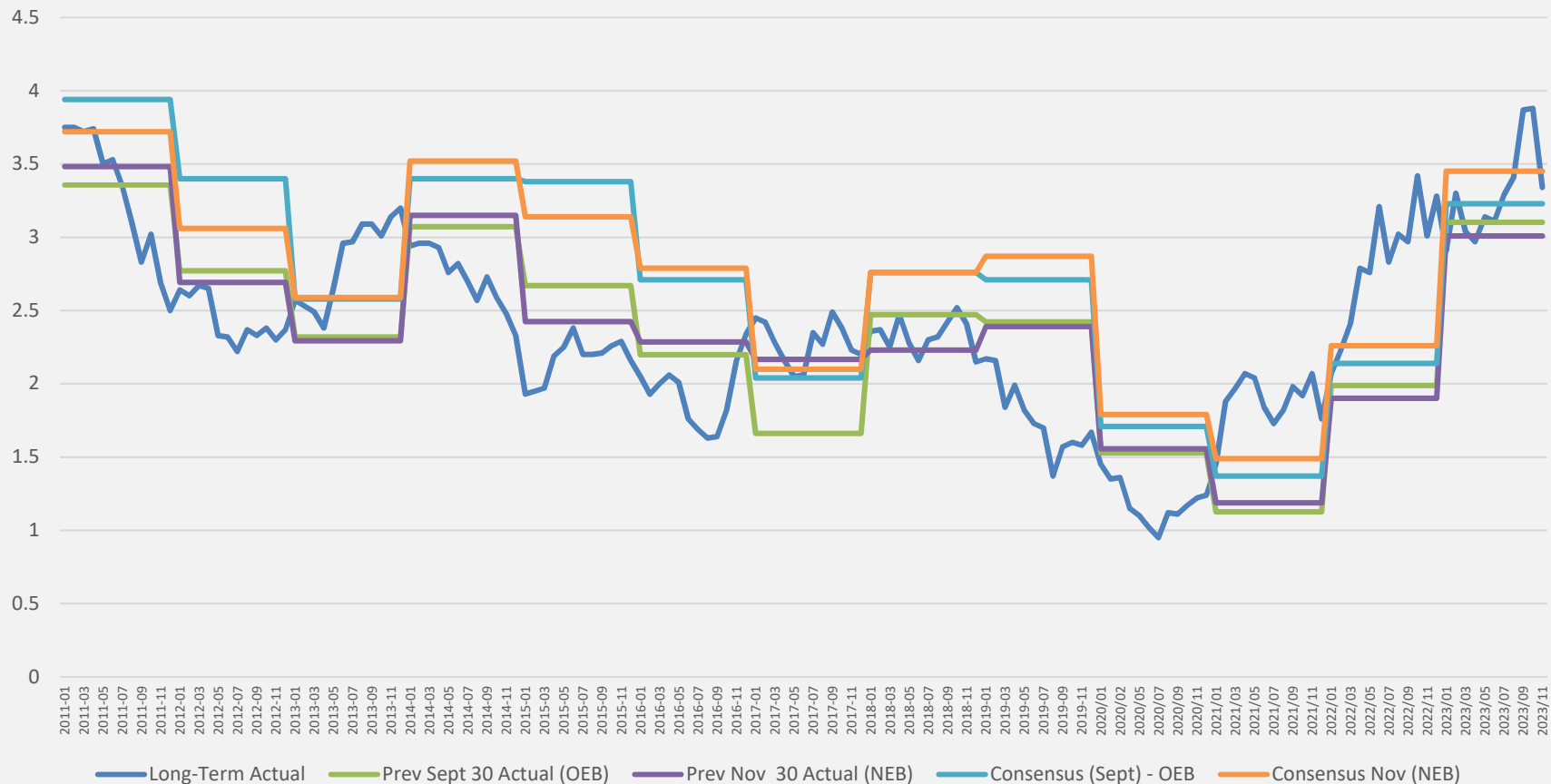
LCBF and UtilSpread Estimates (cont'd)

- **Issue #1 - Using Historical Averages versus Sept. 30 Point Estimates:**
- Using historical 365-day (or 90-day) averages includes data that could in some cases be well over 366 (or 100 days) old).
- **Using more recent timely market data** based on the most recent available data will **provide better forecasts** of rates and spreads that will prevail in the subsequent test period.
- For example, current 30-year GoC rates (3.19% as of Aug. 29) reflect several events that have happened over the past 90 days, including the Bank of Canada lowering its policy rate from 5.0% (to 4.75% in June and to 4.5% in July) due to cooling inflation expectations, recent U.S. economic data indicating a further cooling in U.S. inflation and slowing in economic activity (that has caused many to increase their forecasted probability for a Fed rate decrease in September). More importantly, bond yields include compensation for **expected inflation rates**, which have declined dramatically from expectations last August, and also over the last 90 days. Therefore, it is inappropriate to take into consideration (in an average) the yields that existed when expected inflation rates were higher.
- This is also true for estimating the Util Spread factor, since like most capital market factors, this variable changes through time in response to current information.



LCBF and UtilSpread Estimates (cont'd)

- **Issue #2 - Using Forecasts versus Actual Yields:**
- Section 3.7 and Appendix A of my evidence shows that **using actual prevailing yields provides statistically significantly better forecasts** than using forecast yields (which displayed a **+0.40% upward estimate bias** – see Table A.1.1 of Appendix A).





LCBF and UtilSpread Adjust. Factors

- **Cleary:** Adapt the current OEB factors of 0.5 for each factor to **0.75**.
- Allowed ROEs in Ontario (and other jurisdictions) have simply not declined adequately in response to the reduction in the cost of capital that utilities' have experienced, as long-term government bond yields and A-rated utility bond yields have declined significantly over the last two decades. As a result, the spreads between allowed ROEs and these two measures, both of which directly affect the utilities' cost of capital, **have *increased* dramatically though the years.**
- Figure 9 in Section 5.1 of my evidence reports the allowed ROEs that would have resulted if the OEB had used an adjustment factor of 0.75 instead of 0.5 for both terms in its ROE formula. The graph shows that **increasing the adjustment factors of 0.75 makes allowed ROEs more responsive to changing market conditions** than using 50% adjustment factors, **but not significantly more volatile.**
- Based on this evidence, I recommend an **adjustment factor of 0.75 for both factors**, which maintains the relationship, and is more responsive to changing market conditions, but will reduce year-to-year fluctuations in allowed ROEs relative to a weighting of 1.0.



LCBF and UtilSpread Adjust. Factors (cont'd)

- **LEI:** Use **0.26** and **0.13** respectively.
- **Concentric:** Use **0.40** and **0.40** respectively.
- LEI and Concentric base their recommended adjustment factors for LCBF and UtilSpread on the results of multivariate regressions that regress **U.S. allowed ROEs** on **U.S. government bond yields** and **U.S. corporate bond yield spreads**.
- The results of these regressions are simply **not relevant** with respect to current capital market conditions in Canada that are intended to be reflected in the OEB's ROE formula, as captured by changes in LCBF and UtilBondSpread, and therefore should not be considered.
- Allowed ROEs in U.S. jurisdictions do not have a direct relationship with changes in capital market conditions in Canada, and **are not market data**.



Equity Ratio (ER) Recommendations

- **Dr. Cleary:** The allowed ER ratio for Hydro One Inc. (HOI) should be **reduced to 38% in 2025**, then reduced **gradually to 36% over the following 2-3 years**, so that it is in line with the allowed ER for Enbridge Gas Inc. (EGI) I recommended during the 2023 EGI rebasing proceedings.
- This recommendation is based on my analysis in Section 6, which shows:
 - Currently, HOI maintains the following **strong and stable long-term debt ratings**: DBRS – A(high) – Stable; S&P – A(Stable); and, Moody's – A3.
 - Recent debt rating reports identify **excellent business risk** and **very low industry risk** (S&P); as well as **reasonable regulatory support** (DBRS Morningstar) as strengths for Hydro One Inc. (HOI).
 - HOI is **able to attract debt capital at attractive rates** that correspond to those of similar low-risk utilities.
 - HOI has been able to **consistently earn its allowed ROEs or higher** over the most recent six-year period – a strong indicator that HOI possesses low total risk.
 - HOI's **credit metrics are very strong**, with two of them consistently falling in DBRS' A range, and with one consistently falling in the AA category. This is reflected in HOI's ability to attract debt capital at attractive rates.



Equity Ratio (ER) Recommendations

- **Concentric:** Recommends an across the board increase in ERs for Ontario Electric T&D and Gas D utilities to **45%**, and that the 45% allowed ER for OPG be reviewed in a separate proceeding.
- This recommendation was supported mainly by Concentric's assertion that this increase was needed to **bring the ERs in line with U.S. utilities**, since its own evidence showed the allowed ERs in Ontario are **in line with other Canadian jurisdictions**.
- Further, this recommendation is **inconsistent with its recent recommendations** in Canadian proceedings:
 - November 7, 2023 – Newfoundland Power (NP) proceedings - recommended allowed **ROE of 9.85%** / allowed ER of **45%**, **similar to** its current recommendations for Ontario utilities of **10% / 45%**. Despite Concentric's arguments that **NP faces significant risks not applicable to Ontario utilities**.
 - February 1, 2023 - Alberta GCOC proceedings - recommended an allowed **ROE of 9.5%** and an allowed **ER of 40%**, (both **well below** its current recommendations for Ontario utilities) – and stated that these recommendations were based on bringing Alberta utilities **in alignment with "the deemed equity ratios of comparable-risk electric utilities in Ontario and elsewhere across Canada."**