INSTITUTE OF CHARTERED ACCOUNTANTS, GHANA

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ICAG/BOG/GGDDEP/23/2

20th January 2023

The Governor,
Bank of Ghana,
Head Office,
Accra.

Dear Dr. Ernest Addison,

DETERMINING AN APPROPRIATE DISCOUNT RATE FOR PURPOSES OF FAIR VALUING THE NEW BONDS

We refer to the meeting held on 13th January 2023 with the Government's Economic Management Team (EMT), the Ministry of Finance, the Bank of Ghana, and other key stakeholders and the expectation that we determine and share an appropriate discount factor to be used to fair value the new bonds.

The Institute of Chartered Accountants, Ghana after extensive consultation with its member firms and valuation experts has determined a range of discount factors with justifications that could be used to fair value the new bonds. These discount factors have been determined based on indicators available to the experts as at today, 20th January 2023.

We value the collaborative efforts made and will remain dedicated to providing Government technical support when needed. Should you require further explanation, please do not hesitate to contact us.

Thank you.

Yours faithfully,

PRESIDENT
INSTITUTE OF CHARTERED
ACCOUNTANTS (GHANA)
P. O. BOX 4268 ACCRA

Sena Dake
President (ICAG)

Cc.: First Deputy Governor
Second Deputy Governor
Head of Banking Supervision

INSTITUTE OF CHARTERED ACCOUNTANT GHANA (ICAG)

3rd SUBMISSION ON REVIEW OF DISCOUNT RATE(S) TO BE USED FOR THE VALUATION OF THE NEW BONDS UNDER THE GHANA'S DOMESTIC DEBT EXCHANGE (GDDE) USING REVISED EXCHANGE MEMORANDUM OF 30th DECEMBER 2022

Section 1: Context

- This paper references the 2nd submission by the ICAG in which we were to revert with our comments on the 12% discount rate proposed by the Bank of Ghana for the fair valuation of the new bonds.
- We acknowledged in that paper that fair value determination in the context of the current market conditions is not a simple process. This is because, the new bonds are yet to be issued, and there is no market data for these specific bonds, whereas the current market for existing bonds face significant structural challenges.
- This paper addresses:
    - Our perspective on the 12% rate proposed by the Bank of Ghana;
    - Justification and range of discount rates;
    - The next steps regarding Expected Credit Loss (ECL) impact assessment; and
    - Stakeholder discussions.

Section 2: ICAG's perspectives on the discount rate of 12% proposed by BoG

BoG's proposal and summary of assumptions	ICAG's perspectives
The BoG's proposed discount rate of 12% is based on the following assumptions: • The government of Ghana has already obtained a staff level agreement with the International Monetary Fund (IMF), and this discount rate is expected to slightly exceed reasonably, the cost of funding over the period. • The IMF programme is expected to restore debt sustainability over the medium term by moving the current high risk of debt distress to a moderate risk of debt distress by 2028. • Monetary and exchange rate policies will basically aim at lowering inflation and rebuilding reserves. Inflation is expected to return 8+/-2% by end of 2025. • With inflation back to around 8% and with a historical real interest rate of 3 to 4%, BOG expects nominal rates to fall to a range between 100% and 12%.	We understand that a key driver behind the lower proposed yield is the reduction in coupon rates. The original bonds' weighted average coupon rate of approximately 20% are expected to be reduced to a weighted average coupon rate of about 9.5%. It is worthy of note that the yield curve from our markets in periods of single digit inflation have been much higher than the 12% proposed. Also, structural reforms tend to embed themselves over time and the impact of these are rarely immediate. It would be expected that based on fiscal discipline and commitment to economic reforms exhibited by the Republic, market participants will respond accordingly over time.

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• Computing a loss on the new instrument at inflation rate +300bps would result in a blended discount rate of 10.7%, which is lower than the proposed 12%. • Also discounting at inflation (8%) +400bps would also yield a higher recovery value on the new instrument. The inflation plus 400bps is the steady state pricing of T bills as per the macro framework. • BOG believes that there is empirical evidence to suggest that these targets are sound and achievable as they were used in Government's projection for the SLA and since these targets have been attained in the past.	As a result, it is difficult to completely exclude any input of the current and recent market activities on the valuation of this instrument from an IFRS 13 perspective. Therefore, the 12% proposed yield when compared to the yields of other markets within the region will be too low for the purpose of valuing these instruments in the 2022 financial statements.

Section 3: Valuation approaches and estimation of range of discount rates

Based on the complexities around the current market conditions, and the fact that the bonds are yet to be issued under a set of fiscal environments, a direct market valuation may be unrealistic for which reason proxy approaches need to be considered. The use of proxy approaches involves a combination of valuation assumptions and the use of observable data to the extent possible.

Consequently, it is unlikely a single outcome may be reached from a modelling perspective. The Institute leveraged on the expertise of a technical team with valuation experts for thorough assessment and a range of estimates.

We present below a summary of the valuation approaches and the range of discount rates:

Summary of valuation approach	Range
VIEW ONE (1) • Cash flows are projected in accordance with the terms of the Debt Exchange Memorandum. A pre-crisis Ghanaian government bond yield curve is used to estimate the impact of the restructure. The purpose of this is to create an economic yield curve which is reflective of pre-crisis levels, and which can be used to estimate a value reflective of a stable environment for the restructured bonds. • A pre-crisis yield curve was selected as of 29th April 2022. Selection was done on the basis that yields began increasing on all Ghanaian issued debt during May 2022. The cut-off point is selected with reference to the curve reflecting a pre-crisis fiscal	19.63% - 23.65%

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environment, and therefore more stable returns on government bonds. This curve also reflects a yield curve that is consistent with history for the past 3 years prior to the current economic difficulties, while simultaneously being the most recent observation of a relevant yield curve. • The yield curve that was obtained (and historical Ghanaian benchmark yield curves in general) typically only have points up to 3 years. To control this, interpolation is used to solve the rate up to the 4-year point, which is fixed thereafter. This is consistent with global practice in extrapolation yield curves, on the basis that it reduces uncertainty in the projected rate. This method is preferred to other methods that could have been used under this approach, however these other methods are expected to involve more risk and uncertainty and are often difficult to replicate due to mathematical complexity. • Based on the valuation results above, we arrived at a yield-to-maturity of approximately 21.6%. Certain qualitative factors are also considered which allows for an increase or decrease to the yield. This results in the range proposed above.	
VIEW TWO (2) Three (3) options were used to construct a range of discount factors as follows: Option 1: • Uses data points provided by BoG. It was then adjusted for the difference between the real interest rate proposed by BoG and average real interest rates on 5-year bonds based on observable data in the market. Based on historical data, the real interest rates on the market for 5-year bonds ranges from 8.0% to 13.9%. Option 2: Uses 9% long term inflation [Source: Fitch] and verified real interest rates based on observable data in the market. This approach considers interest rates during periods where the country's inflation rate was a single digit. The projected medium term discount factor is an average of the interest rates recorded for the periods when inflation in Ghana was single digit. • Indicative discount rate ranges from 16.0% to 19% based on Option 1 and 2.	16% - 21.7%

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Option 3: • This approach considers interest rates during periods where the country's inflation rate was a single digit. • Periods observed were April 2021 to August 2021 and January 2019 to March 2020 • Indicative discount rate ranges from 18.8% to 21.7% based on Option 3.	
VIEW THREE (3) To determine the fair value of the new bonds under the exchange program, the yield to be applied will vary based on the term structure of the bond. The earlier years will have lower yield rates applied than in later years. The yields to maturity of the old bonds at the measurement date was considered an appropriate rate. This reflects what market participants will consider when pricing the new bonds as they expect to receive the cash flows under the program. Banks cannot ignore information on the current market in determining fair values. Level 2 inputs related to transactions are relevant and should therefore be considered in the valuation technique. Indeed, significant adjustments to the Level 2 input may be necessary as a result of decreases in the volume or level of activity for the asset or liability in relation to normal market activity, Hence, the quotes and prices of bond traded at 30th December 2022 were collected and analysed. The yields in relation to the maturities of the eligible bonds at 30th December 2022 were observed from the market as follows: • Term Structure: Despite the dispersed yields on the old bonds, term structures generally seem to evolve along different yield levels. Hence, market participants don't seem to consider the potential future cashflows as defined by the GDDE but rather the original cash flows of the different issuances. Otherwise, we would expect a more uniform yield structure along the various maturities. • Evaluated Prices: The yields derived from evaluated prices range from 35% at the short end up to 47% at the long end. The evaluated prices are mostly consistent between different vendors. However, Bloomberg informed us that they currently do not affirm their evaluated prices.	19% to 37%

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- Indicative Broker Quotes We see indicative broker quotes from 6 broker-dealer which can be attributed to 4 different yield levels. 2 of these yield levels are supported by traded prices.

- Traded Prices: Traded prices are dispersed. Most trades and the highest density of observations lie within a yield level between 20 and 35%.

- Due to the missing support by traded prices and the inability of one vendor to affirm the provided price information, we did not consider the evaluated price points in constructing the yield range. Indicative broker quotes with yield levels of 20% and 35% receive support by traded prices. For constructing a yield range, we considered where we observed the highest density of traded prices and overlaps between traded prices and indicative broker quotes.

- The proposal being made therefore is as follows:

New Bonds maturing in 2027 to 2028	19% - 35%
New Bonds maturing in 2029 to 2034	20% - 36%
New Bonds maturing in 2035 to 2038	22% - 37%

VIEW FOUR (4)

The starting point of rate determination was a pre-crisis period of 2021 Government of Ghana bond yield curve. The 2021 average yields used are as follows:

2years - 30.32%
5years – 21.9%
10years – 14.19%
15years – 18.7%

- 31st December 2021 yields were used because that was the period before the main crises including when inflation started to escalate.
- Allowances were made for an increase in yields in advance countries such as the United States of America for the same period.
- A further adjustment was also considered for credit risk with respect to the deterioration of the credit worthiness of the Government of Ghana considering the current economic circumstances.
- Cash flows were projected based on the terms of the Debt Exchange Memorandum. This is subject to change if there are further amendments to the current debt exchange program.

Based on our calculations above, we estimated the yield to maturity to range from 15.67% to 31.91%.

15.67% to 31.91%

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Section 3: Next steps regarding ECL impact assessment

3.1 Estimates of ECL (prior to issue of the bond)

- Considering that we have several assumptions and different scenarios, it is expected that institutions will estimate ECL using an appropriate range or discount rate which is acceptable to their auditors given the extent of judgement involved in estimating the rate and the wide variation of the ranges.

3.2 ECL post issue of the new bonds but before financial statements sign off date (point of congruence)

- At the reporting date impairment and changes in fair value will be determined based on the fair value of the new bonds using the estimates of cash flows under the exchange program discounted at the estimated yield at the exchange settlement date.
- However, subsequent to the reporting period but before the financial statements are authorized for issue, if the bonds are issued and trading prices are available at that date, the trading quotes and prices would be considered in re-estimating the impairment and changes in fair value at 31st December 2022.
- Given that the bonds are expected to be issued and traded before 31st March when most entities will be reporting, it is important for the ECL estimates made in Section 3.1 above to be re-estimated based on actual market data and appropriate adjustments made.

Section 4-Stakeholder discussions

We propose a meeting with representation of the key stakeholder groups (the Bankers, BoG, ICAG and the Auditors of the banks to discuss the contents of this and other discussion papers issued by ICAG regarding the debt exchange programme.

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