Appendix 2

1. Calculation of risk-weighted assets using the LTA

Consider a fund that replicates an equity index. Moreover, assume the following:

- Bank uses the Standardised Approach for credit risk (SACCR or CEM as applicable) when calculating its capital requirements;
- Bank owns 20% of the shares of the fund;
- The fund holds short term (less than one year) forward contracts that are cleared through a qualifying central counterparty (with a notional amount of ₹100); and
- The fund presents the following balance sheet:

Assets
Cash ₹ 20
Government bonds (AAA rated) ₹ 30
Variation margin receivable – forward contracts ₹ 50

Liabilities
Notes payable ₹ 5

Equity
Shares ₹ 95

Balance sheet exposures of ₹100 shall be risk weighted according to the risk weights applied for cash (RW=0%), government bonds (RW=0%), and centrally-cleared equity forward positions (RW=2%). The underlying risk weight for equity exposures (RW=250%) is applied to the notional amount of the forward contracts and there is a charge for counterparty credit risk. There is no CVA charge assessed since the forward contracts are cleared through a central counterparty.

The leverage of the fund is 100/95≈1.05.

Therefore, the risk-weighted assets for the bank's equity investment in the fund are calculated as follows:

$$Avg\ RWfund * Leverage * Equity\ investment =$$

$$\frac{(RWA_{cash} + RWA_{bonds} + RWA_{underlying} + RWA_{forward} + RWA_{CCR})}{Total\ Assetsfund} * Leverage * Equity\ investment =$$

= ((₹20*0% + ₹30*0% + ₹100*250% + ₹50*2% + ₹100*6%*2%)/100) * 1.05 * (20%*95)
= ₹50.10

2. Calculation of risk-weighted assets using the MBA

Consider a fund with assets of ₹100, where it is stated in the mandate that the fund replicates an equity index. In addition to being permitted to invest its assets in either cash or equities, the mandate allows the fund to take long positions in equity index futures up to a maximum nominal amount equivalent to the size of the fund's balance sheet (₹100). This means that the total on balance sheet and off balance sheet exposures of the fund can reach ₹200. Consider also that a maximum financial leverage of 1.1 applies according to the mandate. The bank holds 20% of the shares of the fund, which represents an investment of ₹18.18.

First, the on-balance sheet exposures of ₹100 shall be risk weighted according to the risk weights applied for equity exposures (RW=250%), ie $RWA_{on\text{-}balance}$ = ₹100 * 250% = ₹250.

Second, we assume that the fund has exhausted its limit on derivative positions, ie ₹100 notional amount, which would be weighted with the risk weight associated with the underlying of the derivative position, which in this example is 100% for publicly-traded equity holdings. The total risk-weighted assets related to the maximum notional amount underlying the derivative positions are hence $RWA_{underlying}$ = ₹100 * 250% = ₹250.

Third, we would calculate the counterparty credit risk associated with the derivative contract. If we do not know the replacement cost related to the futures contract, we would approximate it by the maximum notional amount, ie ₹100 and also calculate the add-on by applying a 15% conversion factor, resulting in an exposure amount of ₹115. Assuming the futures contract is cleared through a qualifying CCP, a risk weight of 2% applies, so that RWA_{CCR} = ₹115 * 2% = ₹2.3. There is no CVA charge assessed since the futures contract is cleared through a central counterparty.

The RWA of the fund is hence obtained by adding $RWA_{on\text{-}balance}$, $RWA_{underlying}$ and RWA_{CCR}, ie ₹502.3.

Leverage adjustment
The RWA (₹502.3) shall be divided by the total assets of the fund (₹100) resulting in an average risk weight of 502.3%. The average risk-weight is then scaled up by a factor of 1.1 to reflect financial leverage = 502.3%*1.1 = 552.53%. Finally, as the bank invested ₹18.18 in the equity of the fund, its total RWAs associated with its equity investment amount to ₹18.18 * 552.53% = ₹100.45

3. Calculation of the leverage adjustment

Consider a fund with assets of ₹100 that invests in corporate debt. Assume that the fund is highly levered with equity of ₹5 and debt of ₹95. Such a fund would have financial leverage of 100/5=20.

Consider the following two cases:

Case 1: Fund specialises in low-rated corporate debt

Assets

Cash	₹ 10
A+ to A- bonds	₹ 20
BBB+ to BBB- bonds	₹ 30
Below BBB- bonds	₹ 40

The average risk weight of the fund is (₹10*0% + ₹20*50% + ₹30*100% + ₹40*150%)/₹100 = 100%. The financial leverage of 20 would result in a risk weight of 2000% for the banks' investment in this highly levered fund, however, this is capped at a conservative risk weight of 1111% (equivalent to full capital deduction).

Case 2: Fund specialises in high-rated corporate debt

Assets

Cash	₹ 5
AAA to AAA- bonds	₹ 75
A+ to A- bonds	₹ 20

The average risk weight of the fund is (₹5*0% + ₹75*20% + ₹20*50%)/₹100 = 25%. The financial leverage of 20 results in a risk weight of 500%. The above example illustrates that the rate at which the 1111% cap is reached depends on the underlying riskiness of the portfolio (as judged by the average risk weight) as captured by Basel II Standardised Approach risk weights or the IRB methods. Therefore, for a "risky" portfolio (100% average risk weight), the 1111% limit is reached fairly quickly with a leverage of 11.1x, while for a "low risk" portfolio (25% average risk weight) this limit is reached at a leverage of 44.44x