Structured Note. Assume that the current peso exchange rate is $1 to 10 pesos. You are considering the purchase of a one-year note with the following redemption value formula:

Redemption Value

\[
= \$10,000,000 \times \max[0, 1 + \text{Peso}_1 \text{ term}] \times (10/\text{Peso}_1)
\]

where:

\[
\text{Peso}_1 \text{ term} = (10 - \text{Peso}_1)/10
\]

and where:

\[
\text{Peso}_1 = \text{spot exchange rate (pesos/dollar) in one year}
\]

a) What is the payoff of this note for the following spot exchange rates of the peso in one year?

i) $0.05/peso
   If the spot rate is $0.05, then \text{Peso}_1 \text{ term} = -1, so note multiplier = (1 + (-1))(10/20) = 0
   Note pays zero at maturity.

ii) $0.10/peso
    If the spot rate is $0.10, then \text{Peso}_1 \text{ term} = 0, so note multiplier = 1 and the note pays $10 million

iii) $0.15/peso
    If the spot rate is $0.15, then \text{Peso}_1 \text{ term} = 1/3, so note multiplier = (1 + 1/3) x (10/6.67) = (4/3)x(3/2)
    so the multiplier is 2, and the note pays $20 million

iv) $0.20/peso
    If the spot rate is $0.20, then \text{Peso}_1 \text{ term} = 1/2, so note multiplier = (1 + 1/2) x (10/5) = (1.5)x(2) so
    the multiplier is 3, and the note pays $30 million

b) Describe this note in terms of vanilla instruments such as bonds, forwards, or options.

The payoff can be thought of two different ways:

   i) This is a call option on 200 million pesos with a strike price of $0.05/peso
   Or

   ii) This is a $10 million zero-coupon bond paying 0% interest, combined with
        a. A forward contract to buy 200 million pesos at $0.10/peso;
        and

        b. A long put option on 200 million pesos with a strike price of $0.05.

(The Note could be valued using either definition (i) or definition (ii)).