Ralph's Economic Income

Ralph, the firm owner, invests \$100 at time zero in productive assets that yield cash flows of \$0 and \$121 at the end of years one and two, respectively. Markets are perfect and complete (all assets and equities are priced to yield the market rate of interest). Assume risk neutral pricing (individual's make decisions to maximize expected wealth) throughout. The market rate of interest $r$ is a constant 10% per year for the two-year period. Ralph's firm values assets and equities at the present value of their future cash flows (i.e., uses 'perfect market' accounting). The firm distributes cash to Ralph equal to expected economic earnings (the market interest rate times beginning of the period owners' equity) each year. Any cash shortfall is made up through bank borrowing by the firm at the market rate of interest and the loan is repaid in full at the end of the second year. The value of ownership claims is $V_t = b_t + \sum_{k=1}^{T} \frac{E[Income_{t+k} - r * b_{t+k-1}]}{(1+r)^k}$ where $b_t$ is book value of owners' equity and $T$ is the number of periods until the liquidation date.

Part A. Required: Fill in the time 0, time 1, and time 2 pro forma Balance Sheets, and Income Statements for periods 1 and 2 below. Identify firm value $V_t$ at time 0 and time 1.

| Pro forma Balance Sheets and Income Statements | | | |
|---|---|---|---|
| | | | |
| Balance sheets | Time 0 | Time 1 | Time 2 |
| Cash | \$0 | | |
| Productive assets | | | |
| Total assets | | | |
| Debt | | | |
| Owners' equity: contributed capital | \$100 | \$100 | \$100 |
| retained earnings | 0 | | |
| Total equities (liabilities plus owner's equity) | \$100 | | |
| | | | |
| Income statements & owners' equity reconciliation | | Period 1 | Period 2 |
| Operating cash flows | | \$0 | \$121 |
| Appreciation(depreciation) | | | |
| Operating income | | | |
| Interest income(expense) | | | |
| Net income | | | |
| plus beginning retained earnings | | 0 | |
| less distributions to the owner | | | |
| Ending retained earnings | | | |

Part B: Now, suppose cash flow at time 2 are uncertain (first period cash flow remains zero). In particular, second period cash flow is equally likely to be \$132 or \$110. Everything else remains as in part A.

Required:
1. Provide pro forma time 0, time 1, and time 2 balance sheets, and period 1 and period 2 income statements assuming management learns at time 1 that second period cash flow will be \$132 and conveys the information via the financial statements when learned. Identify firm value $V_t$ at time 0 and time 1.

| Pro forma Balance Sheets and Income Statements | | | |
|---|---|---|---|
| | | | |
| Balance sheets | Time 0 | Time 1 | Time 2 |
| Cash | \$0 | | |
| Productive assets | | | |
| Total assets | | | |
| Debt | | | |
| Owners' equity: contributed capital | \$100 | \$100 | \$100 |
| retained earnings | 0 | | |
| Total equities (liabilities plus owner's equity) | \$100 | | |
| | | | |
| Income statements & owners' equity reconciliation | | Period 1 | Period 2 |
| Operating cash flows | | \$0 | \$132 |
| Appreciation(depreciation) | | | |
| Operating income | | | |
| Interest income(expense) | | | |
| Net income | | | |
| plus beginning retained earnings | | 0 | |
| less distributions to the owner | | | |
| Ending retained earnings | | | |

2. Provide pro forma time 0, time 1, and time 2 balance sheets, and period 1 and period 2 income statements assuming that second period cash flow is \$132 at time 1 but it is not learned until realized at time 2. Identify firm value $V_t$ at time 0 and time 1.

| Pro forma Balance Sheets and Income Statements | | | |
|---|---|---|---|
| | | | |
| Balance sheets | Time 0 | Time 1 | Time 2 |
| Cash | \$0 | | |
| Productive assets | | | |
| Total assets | | | |
| Debt | | | |
| Owners' equity: contributed capital | \$100 | | |
| retained earnings | 0 | | |
| Total equities (liabilities plus owner's equity) | \$100 | | |
| | | | |
| Income statements & owners' equity reconciliation | | Period 1 | Period 2 |
| Operating cash flows | | \$0 | \$132 |
| Appreciation(depreciation) | | | |
| Operating income | | | |
| Interest income(expense) | | | |
| Net income | | | |
| plus beginning retained earnings | | 0 | |
| less distributions to the owner | | | |
| Ending retained earnings | | | |