

**Problem 7-11**

**Goal:** Determine net savings using MACRS depreciation compared to straight line

**Given:** New Investment \$10,000 **P**  
 Sold for \$7,000 **income**  
 used 4 **n, years**  
 MACRS recovery period 5 **n, years**  
 MACRS 4 yr book value \$1,728  
 Total income tax reate 35% **i<sub>income</sub>**  
 Capital gains tax rate 20% **i<sub>capital gains</sub>**

**Approach:** Determine capital gain with on book value with each type of depreciation, then capital gain taxes  
 ASSUME 5 year life for straight line depreciation  
 Discount using compound interest equation to determine present worth of future sum

**Calculations:**

(1) MACRS capital gain \$5,272 **taxable capital gain income<sub>profit</sub>** = \$7,000 sold - \$1,728 book value  
 Tax on capital gain \$1,054.40 = 0.20 <sub>tax rate</sub> \* \$5,272 <sub>gain</sub>  
 previous income tax deductions \$8,272.00 = \$10,000 <sub>initial</sub> - \$1,728 <sub>book value</sub>

(2) Straight line book value \$2,000 **annual depreciation** = \$10,000 investment / 5 year life  
 \$2,000 **book value** = \$10,000 investment - 4 year \* \$2,000  
 \$5,000 **taxable capital gain income<sub>profit</sub>** = \$7,000 sold - \$2,000 book value  
 Tax on capital gain \$1,000.00 = 0.20 <sub>tax rate</sub> \* \$5,000 <sub>gain</sub>  
 previous income tax deductions \$8,000.00 = \$10,000 <sub>initial</sub> - \$1,728 <sub>book value</sub>

Increased income taxes paid with straight line \$95.20 = 0.35 <sub>tax rate</sub> \* ( \$8,272<sub>MACRS</sub> - \$8,000<sub>sl</sub> )  
 Decreased capital gain taxes with straight line (\$54.40) = \$1,054<sub>MACRS</sub> - \$1,000<sub>sl</sub>

**Answer**

**\$40.80** more taxes paid with straight line

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**Alternatively: construct MACRS depreciation table**

year	%	depreciation	book value at end of year	BV <sub>st.line</sub>
1	20.00%	\$2,000	\$8,000	\$8,000
2	32.00%	\$3,200	\$4,800	\$6,000
3	19.20%	\$1,920	\$2,880	\$4,000
4	11.52%	\$1,152	<b>\$1,728</b>	\$2,000
5	11.52%	\$1,152	\$576	\$0
6	5.76%	\$576	\$0	note 1/2 year convention

  

	MACRS - st.line	tax savings with MACRS	cumulative tax savin
1	\$0.00	\$0.00	\$0.00
2	\$1,200.00	\$420.00	\$420.00
3	(\$80.00)	(\$28.00)	\$392.00
4	(\$848.00)	(\$296.80)	<b>\$95.20</b>
5	(\$848.00)	(\$296.80)	(\$201.60)
6	\$576.00	\$201.60	\$0.00

**Answer**

**\$40.80** net cumulative savings with MACRS

MACRS has 2nd year tax savings and then higher taxes. At the end of the 6 year life the cumulative taxes paid are identical