

Problem 7-14

Goal: Determine income tax reduction using MACRS depreciation compared to straight line

Given: Asset Investment \$850,000 **investment**
 Total income tax \$1,000,000 **income**
 Total expenses \$600,000 **expenses**
 MACRS recovery period 5 **n, years**
 straight line recovery period 9.5 **n, years**
 Total income tax rate 35% **i_{income}**

Approach: Determine MACRS % factor for first year 20% Table 7-9, 5-year property
 Determine straight line depreciation amount/year
 Determine difference, which is taxable income; calculate taxes on difference

Calculations:

- (1) MACRS deduction \$170,000 **depreciation** in first year = \$850,000 investment * 0.20 factor
- (2) Straight line book value \$89,474 **annual depreciation** = \$850,000 investment / 9.55 year life
 $\$80,526$ **taxable income** = \$170,000 MACRS - \$89,474 straight line
 Tax on straight line \$28,184.21 = 0.35 _{tax rate} * \$80,526,000 _{income}

Answer

\$28,184 more taxes paid with straight line

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Alternatively: construct MACRS depreciation table

year	%	depreciation	book value at end of year	BV _{st.line}
1	20.00%	\$170,000	\$680,000	\$760,526
2	32.00%	\$272,000	\$408,000	\$671,053
3	19.20%	\$163,200	\$244,800	\$581,579
4	11.52%	\$97,920	\$146,880	\$492,105
5	11.52%	\$97,920	\$48,960	\$402,632
6	5.76%	\$48,960	\$0	\$313,158
7				\$223,684
8				\$134,211
9				\$44,737
10			note should be 1/2 year deduction =>	(\$44,737)
		MACRS - st.line	tax savings with MACRS	cumulative tax savin
1		\$80,526.32	\$28,184	\$28,184.21
2		\$182,526.32	\$63,884	\$92,068.42
3		\$73,726.32	\$25,804	\$117,872.63
4		\$8,446.32	\$2,956	\$120,828.84
5		\$8,446.32	\$2,956	\$123,785.05
6		(\$40,513.68)	(\$14,180)	\$109,605.26
7		(\$89,473.68)	(\$31,316)	\$78,289.47
8		(\$89,473.68)	(\$31,316)	\$46,973.68
9		(\$89,473.68)	(\$31,316)	\$15,657.89
10		(\$44,736.84)	(\$15,658)	(\$0.00)

Answer

\$123,785 net 5 year cumulative savings with MACRS

MACRS has 5 years of tax savings and then higher taxes. At the end of the 9.5 year life the cumulative taxes paid are identical