

Problem Set 5

Option A

$$PV = 400,000$$

$$r = 4.5$$

$$n = 360$$

$$PMT = \$2026.7912$$

Balance in 5 years

$$r = 4.5$$

$$n = 300$$

$$PMT = -\$2026.7912$$

$$PV = \$364,631.6687$$

Cost for 5 years

$$PV = 400,000 - .01(400,000) - .015(400,000) = \$390,000$$

$$n = 60$$

$$PMT = -\$2026.7912$$

$$FV = -\$364,631.6687$$

$$r = 5.0910\%$$

Option B

1st Mortgage PMT

$$PV = .8(400,000) = \$320,000$$

$$n = 360$$

$$r = 2.5\%$$

$$PMT = \$1264.3869$$

2nd Mortgage Payment

$$PV = 80,000$$

$$n = 120$$

$$r = 8\%$$

$$PMT = \$970.6208$$

$$\text{Total Payment} = 1264.3869 + 970.6208 = \$2235.0077$$

Balance in 5 years, 1st Mortgage

$$n = 300$$

$$r = 2.5$$

$$PMT = \$1264.3869$$

$$PV = \$281,841.2253$$

Cost for 5 years

$$PV = 400,000 - .01(320,000) - .02(320,000) - .01(80,000) = \$389,600$$

$$n = 60$$

$$PMT = -\$2235.0077$$

$$FV = \$329,710.7225$$

$$r = 9.1099\%$$

B is better

Lifetime

Option A

$$PV = 390,000$$

$$n = 360$$

$$PMT = -\$2026.7412$$

$$r = 4.7173\%$$

Option B

$$CF_0 = \$389,600$$

$$CF_1 = -2235.0077$$

$$F_01 = 120$$

$$CF_2 = -1264.3869$$

$$F_01 = 240$$

$$IRR \Rightarrow 3.2561\%$$

B is much better