What to do? (Car loans)

# The scenario

You are shopping for a car for $20,000, and have enough money in your account to pay upfront, but then your salesman says you can get you a low-interest loan, 4% for 3 years. He argues that if you do this and invest your $20,000 at a higher interest rate you will come out ahead. Is he right?

You are smart and know lenders always charge fees, so you ask “What are the fees? for the loan?”

After rummaging around in the back room, the salesman comes back and says, “You’d have a 2% fee,” which would be added to the total loan amount.

So, you have two options:

* Option 1: Take the loan and invest your $20,000 elsewhere.
* Option 2: Do not take the loan, but invest what you would be paying every month.

To determine in which case you will come out ahead, you decide to compute your 3-year gain in each case.

# Option 1 - Take the Loan

If you take the loan:

1a) How much is the total loan with 3% lender fees included?

P\_o = 20000**\***1.03  
P\_o

## [1] 20600

1b) What would be your monthly payment for this loan?

r = 0.03  
N = 3  
k = 12  
RHS = (1**-**(1**+**r**/**k)**^**(**-**N**\***k))**/**(r**/**k)  
  
*# monthy payments*  
d = **round**(P\_o**/**RHS,2)  
d

## [1] 599.07

1c) How much would you pay over the course of this loan?

d**\***12**\***3

## [1] 21566.52

If you take the loan and follow the salesman’s advice, you can invest the $20,000 from your bank account straight into index funds.

1d) Suppose you invest the $20,000 and earn 5% annual interest, compounded monthly. How much would this investment be worth after 3 years?

20000**\***(1+0.05**/**12)**^**(12**\***3)

## [1] 23229.44

# Option 2 - Do not take the loan

If you do not take the loan, you would have no monthly payment, so you could invest the same amount of money as your monthly payment (from 1b) each month.

2a) If you invest the money you would be paying against your car payment (from 1b) into index funds each month (earning 5% annual interest, compounded monthly), how much this fund be worth after 3 years?

d

## [1] 599.07

r = 0.05  
N = 3  
k = 12  
d**\***((1**+**r**/**k)**^**(N**\***k)**-**1)**/**(r**/**k)

## [1] 23215.96

# Your decision

1. Was the salesman right? Which option is better? By how much would you come out ahead? By how much would you come out ahead? What would you choose and why?

23229.44 **-** 23215.96

## [1] 13.48

You would come out $13.48 ahead if you took the car loan. If I wanted to build credit, I’d take the loan.