

FUTURE FINANCIAL PLAN FOR AN ENGINEER

Presented by
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References

- “Entry level software engineer” salary in Boston”, Glassdoor 2023 ([Link](#))
- House rents in Boston, Zillow, Aprtments.com ([Link](#))
- Car prices 2023 ([Link](#))
- Boston Public Transportation 2023 – MBTA ([Link](#))

Objective and Key Information

Persona:

Name: Zack

Age: 25

Degree: M.S in Computer Science

Location: Boston

Retirement: Plans to retire by 60

Timeline

Graduates with master's degree in Computer Science and gets a job at a tech company

Pays off his graduate education loan

Plans for financial growth

Plans to retire

25

30

40

60

Invest in stocks?

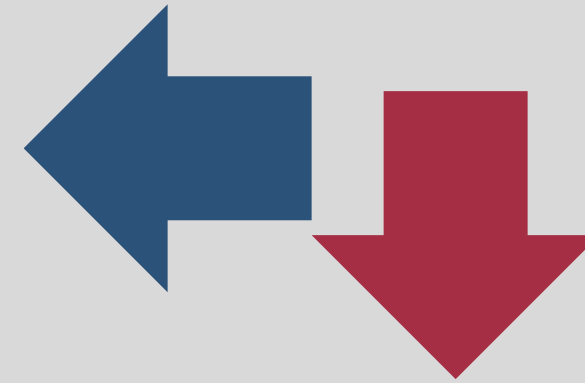
Buy a car?

Buy a house?

Assumptions

- Has savings of \$55,000 by age 25
- Graduate student loan debt – \$60,000
Loan interest rate: 12%
- Tax rate – 29% (Federal + State)
- Salary upon graduation \$144,000
+ joining bonus of \$50,000
- The cost of living is Boston-based
- Stock Investment – \$1500/month and ROI is 8%
- Plans to buy a house worth \$400,000, down payment – \$80,000
- Car Cost– \$30,000, down payment \$6,000
- Public transport/Uber – \$200 (\wedge 3%/year)

Cases and Constraints



House	Mode of Transport	Stock investment
Rent	No Car	NI
Rent	No Car	\$1500
Rent	Car	NI
Rent	Car	\$1500
Buy	No Car	NI
Buy	No Car	\$1500
Buy	Car	NI
Buy	Car	\$1500

- Salary
- Downpayment
- Apartment Cost
- Car Cost
- Education Expense
- Living Expense

Analysis Of the Investment In Stocks

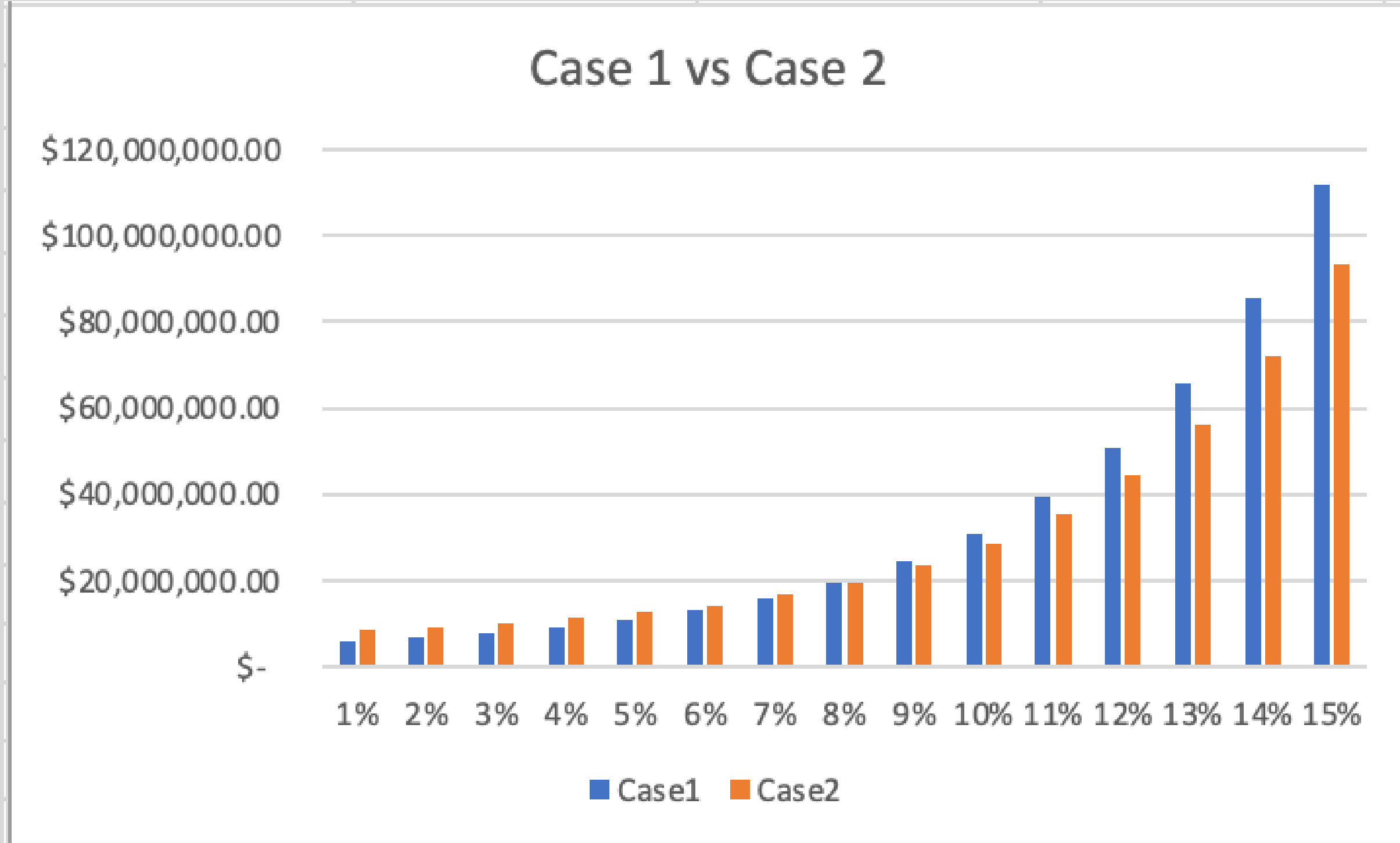
No-Investment is better option if $MARR \geq 8\%$

				Future Worth										
Cases	House	Mode of Transport	Annual Stock Investment	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%	
C1	Rent	No Car	NI	\$5,208,652.42	\$5,873,504.34	\$ 6,707,633.06	\$7,761,550.64	\$9,102,180.13	\$10,818,471.03	\$13,029,003.02	\$15,892,298.57	\$19,620,830.83	\$ 24,500,077.90	\$ 30,914,47
C2	Rent	No Car	\$1500	\$8,019,476.15	\$8,560,378.75	\$ 9,237,135.09	\$10,090,028.89	\$11,172,407.46	\$12,555,156.12	\$14,332,761.30	\$16,631,540.40	\$19,620,830.83	\$ 23,528,224.92	\$ 28,660,34
C3	Rent	Car	NI	\$5,069,941.36	\$5,700,725.93	\$ 6,490,726.65	\$7,487,093.34	\$8,752,195.96	\$10,368,805.81	\$12,447,103.89	\$15,134,176.95	\$18,626,904.52	\$ 23,189,473.98	\$ 29,177,21
C4	Rent	Car	\$1500	\$7,880,765.09	\$8,387,600.34	\$ 9,020,228.68	\$9,815,571.58	\$10,822,423.28	\$12,105,490.90	\$13,750,862.18	\$15,873,418.78	\$18,626,904.53	\$ 22,217,621.01	\$ 26,923,08
C5	Buy	No Car	NI	\$6,825,079.79	\$7,480,965.12	\$ 8,289,598.39	\$9,293,514.05	\$10,548,281.79	\$12,126,742.65	\$14,124,676.64	\$16,668,398.85	\$19,924,957.56	\$ 24,115,846.99	\$ 29,535,47
C6	Buy	No Car	\$1500	\$9,635,903.52	\$10,167,839.54	\$ 10,819,100.42	\$11,621,992.29	\$12,618,509.11	\$13,863,427.74	\$15,428,434.92	\$17,407,640.67	\$19,924,957.56	\$ 23,143,994.00	\$ 27,281,34
C7	Buy	Car	NI	\$6,686,368.74	\$7,308,186.72	\$ 8,072,691.98	\$9,019,056.74	\$10,198,297.62	\$11,677,077.44	\$13,542,777.52	\$15,910,277.23	\$18,931,031.26	\$ 22,805,243.08	\$ 27,798,21
C8	Buy	Car	\$1500	\$9,497,192.46	\$9,995,062.13	\$ 10,602,194.01	\$11,347,534.98	\$12,268,524.94	\$13,413,762.52	\$14,846,535.79	\$16,649,519.05	\$18,931,031.25	\$ 21,833,390.09	\$ 25,544,08

Investment is better option if $MARR \leq 8\%$

Cases	House	Mode of Transport	Annual Stock Investment
C1	Rent	No Car	NI
C2	Rent	No Car	\$1500

Investment (monthly)	(\$1,500)
ROI	8%



Analysis Of the House (Buying and Renting)

Renting of a house is better option if $MARR > 8\%$

1																		
2						Future Worth												
3																		
4	Cases	House	Mode of Transport	Annual Stock Investment	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	
5	C1	Rent	No Car	NI	\$5,208,652.42	\$5,873,504.34	\$6,707,633.06	\$7,761,550.64	\$9,102,180.13	\$10,818,471.03	\$13,029,003.02	\$15,892,298.57	\$19,620,830.83	\$ 24,500,077.90	\$30,914,476.01	\$ 39,382,812.96	\$ 50,606,551.41	▲
6	C2	Rent	No Car	\$1500	\$8,019,476.15	\$8,560,378.75	\$9,237,135.09	\$10,090,028.89	\$11,172,407.46	\$12,555,156.12	\$14,332,761.30	\$16,631,540.40	\$19,620,830.83	\$ 23,528,224.92	\$28,660,342.66	\$ 35,431,192.13	\$ 44,400,935.93	
7	C3	Rent	Car	NI	\$5,069,941.36	\$5,700,725.93	\$6,490,726.65	\$7,487,093.34	\$8,752,195.96	\$10,368,805.81	\$12,447,103.89	\$15,134,176.95	\$18,626,904.52	\$ 23,189,473.98	\$29,177,218.62	\$ 37,069,103.42	\$ 47,512,049.42	
8	C4	Rent	Car	\$1500	\$7,880,765.09	\$8,387,600.34	\$9,020,228.68	\$9,815,571.58	\$10,822,423.28	\$12,105,490.90	\$13,750,862.18	\$15,873,418.78	\$18,626,904.53	\$ 22,217,621.01	\$26,923,085.29	\$ 33,117,482.62	\$ 41,306,433.98	
9	C5	Buy	No Car	NI	\$6,825,079.79	\$7,480,965.12	\$8,289,598.39	\$9,293,514.05	\$10,548,281.79	\$12,126,742.65	\$14,124,676.64	\$16,668,398.85	\$19,924,957.56	\$ 24,115,846.99	\$29,535,473.52	\$ 36,576,057.98	\$ 45,761,261.42	
10	C6	Buy	No Car	\$1500	\$9,635,903.52	\$10,167,839.54	\$10,819,100.42	\$11,621,992.29	\$12,618,509.11	\$13,863,427.74	\$15,428,434.92	\$17,407,640.67	\$19,924,957.56	\$ 23,143,994.00	\$27,281,340.17	\$ 32,624,437.15	\$ 39,555,645.94	
11	C7	Buy	Car	NI	\$6,686,368.74	\$7,308,186.72	\$8,072,891.98	\$9,019,056.74	\$10,198,297.62	\$11,677,077.44	\$13,542,777.52	\$15,910,277.23	\$18,931,031.26	\$ 22,805,243.08	\$27,798,216.14	\$ 34,262,348.46	\$ 42,666,759.47	
12	C8	Buy	Car	\$1500	\$9,497,192.46	\$9,995,061.13	\$10,602,194.01	\$11,347,534.98	\$12,268,524.94	\$13,413,762.52	\$14,846,535.79	\$16,649,519.05	\$18,931,031.25	\$ 21,833,390.09	\$25,544,082.77	\$ 30,310,727.61	\$ 36,461,143.96	
13																		
14																		

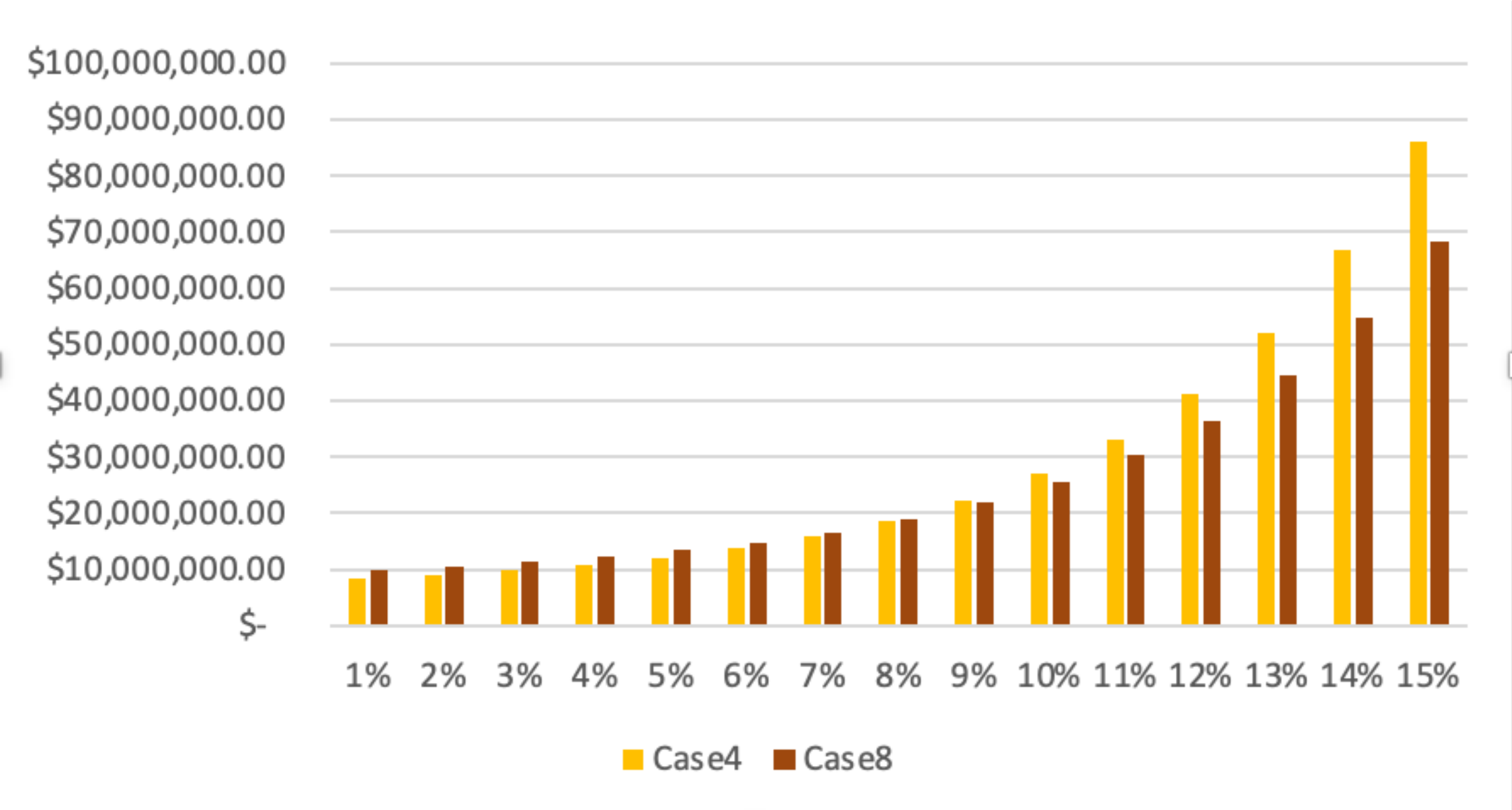
Buying a house is better option if $MARR \leq 8\%$

- C1 and C5
- C2 and C6
- C3 and C7
- C4 and C8

Cases	House	Mode of Transport	Annual Stock Investment
C4	Rent	Car	\$1500
C8	Buy	Car	\$1500

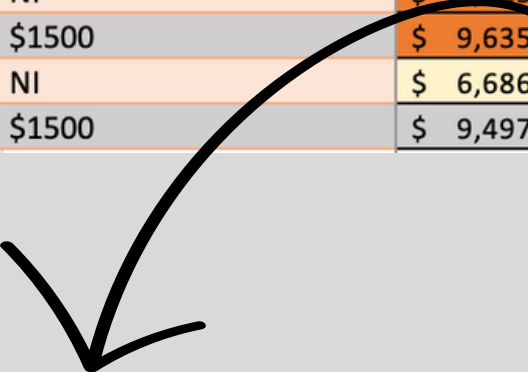
Apartment Rent	\$1,000
Increase in rent annually	6%
Cost of house	\$400,000
Down payment	(\$80,000)
nper for house	420
interest for house loan	6%
monthly pmt for house	(\$1,824.61)
salvage (after 35 years)	\$1,125,544.98

Case 4 vs Case 8



Analysis Of Car (Buy Car or Public Transport)

Cases	House	Mode of Transport	Annual Stock Investment	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
C1	Rent	No Car	NI	\$ 5,208,652.42	\$ 5,873,504.34	\$ 6,707,633.06	\$ 7,761,550.64	\$ 9,102,180.13	\$ 10,818,471.03	\$ 13,029,003.02	\$ 15,892,298.57	\$ 19,620,830.83	\$ 24,500,077.90	\$ 30,914,476.15
C2	Rent	No Car	\$1500	\$ 8,019,476.15	\$ 8,560,378.75	\$ 9,237,135.09	\$ 10,090,028.89	\$ 11,172,407.46	\$ 12,555,156.12	\$ 14,332,761.30	\$ 16,631,540.40	\$ 19,620,830.83	\$ 23,528,224.92	\$ 28,660,342.15
C3	Rent	Car	NI	\$ 5,069,941.36	\$ 5,700,725.93	\$ 6,490,726.65	\$ 7,487,093.34	\$ 8,752,195.96	\$ 10,368,805.81	\$ 12,447,103.89	\$ 15,134,176.95	\$ 18,626,904.52	\$ 23,189,473.98	\$ 29,177,218.15
C4	Rent	Car	\$1500	\$ 7,880,765.09	\$ 8,387,600.34	\$ 9,020,228.68	\$ 9,815,571.58	\$ 10,822,423.28	\$ 12,105,490.90	\$ 13,750,862.18	\$ 15,873,418.78	\$ 18,626,904.53	\$ 22,217,621.01	\$ 26,923,085.15
C5	Buy	No Car	NI	\$ 6,825,079.79	\$ 7,480,965.12	\$ 8,289,598.39	\$ 9,293,514.05	\$ 10,548,281.79	\$ 12,126,742.65	\$ 14,124,676.64	\$ 16,668,398.85	\$ 19,924,957.56	\$ 24,115,846.99	\$ 29,535,473.15
C6	Buy	No Car	\$1500	\$ 9,635,903.52	\$ 10,167,839.54	\$ 10,819,100.42	\$ 11,621,992.29	\$ 12,618,509.11	\$ 13,863,427.74	\$ 15,428,434.92	\$ 17,407,640.67	\$ 19,924,957.56	\$ 23,143,994.00	\$ 27,281,340.15
C7	Buy	Car	NI	\$ 6,686,368.74	\$ 7,308,186.72	\$ 8,072,691.98	\$ 9,019,056.74	\$ 10,198,297.62	\$ 11,677,077.44	\$ 13,542,777.52	\$ 15,910,277.23	\$ 18,931,031.26	\$ 22,805,243.08	\$ 27,798,216.15
C8	Buy	Car	\$1500	\$ 9,497,192.46	\$ 9,995,061.13	\$ 10,602,194.01	\$ 11,347,534.98	\$ 12,268,524.94	\$ 13,413,762.52	\$ 14,846,535.79	\$ 16,649,519.05	\$ 18,931,031.25	\$ 21,833,390.09	\$ 25,544,082.15

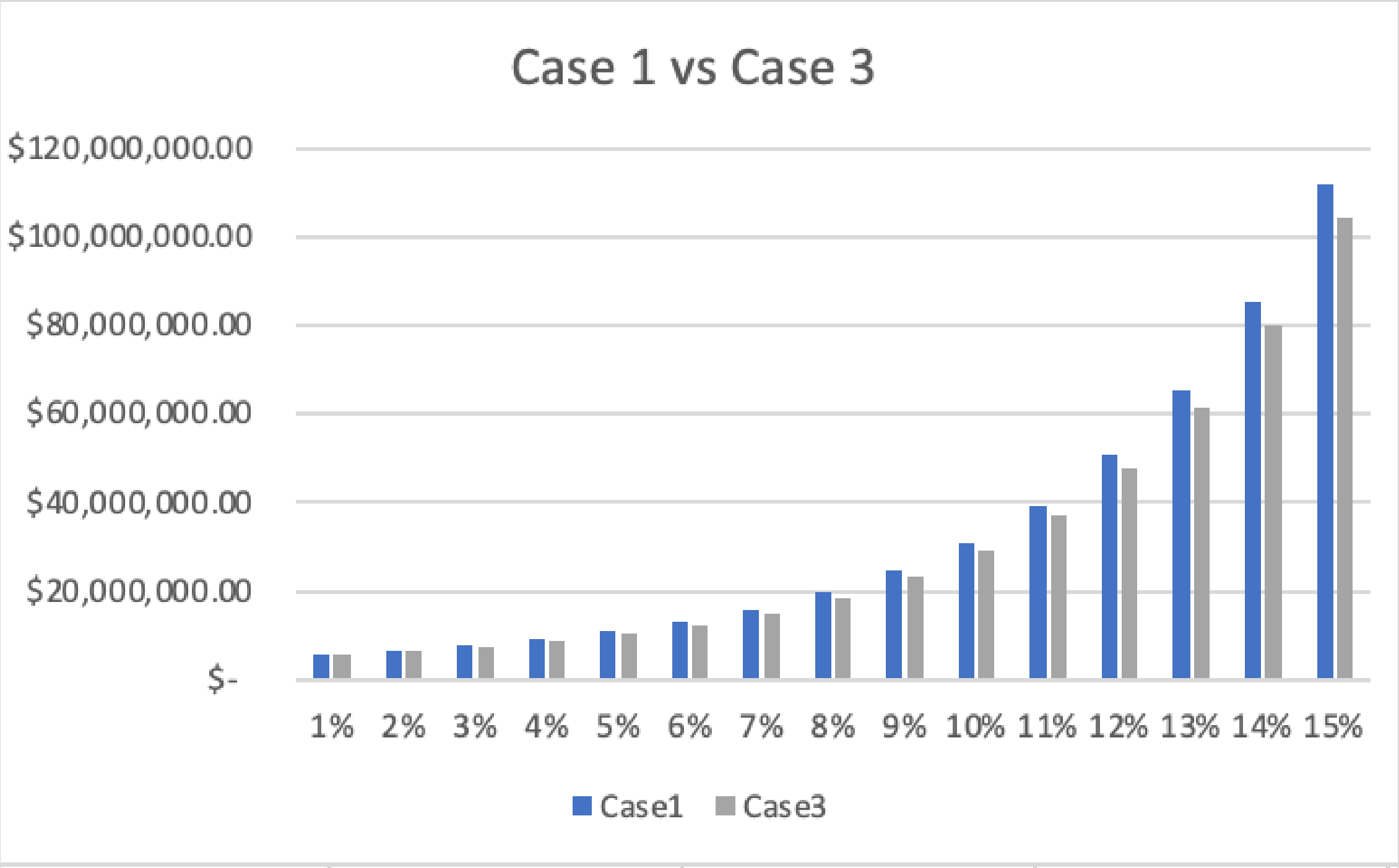


Public Tranport (No Car) is
always better

- C1 and C3
- C2 and C4
- C5 and C7
- C6 and C8

Cases	House	Mode of Transport	Annual Stock Investment
C1	Rent	No Car	NI
C3	Rent	Car	NI

Public Transport	(\$200)
Increment (year)	0.03
Cost of car	\$30,000
Down Payment of car	\$6,000



Overall Analysis

ROI Stock
8%

Best case if
MARR >8%

Cases	House	Mode of Transport	Annual Stock Investment	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
C1	Rent	No Car	NI	\$ 5,208,652.42	\$ 5,873,504.34	\$ 6,707,633.06	\$ 7,761,550.64	\$ 9,102,180.13	\$ 10,818,471.03	\$ 13,029,003.02	\$ 15,892,298.57	\$ 19,620,830.83	\$ 24,500,077.90	\$ 30,914,476.01
C2	Rent	No Car	\$1500	\$ 8,019,476.15	\$ 8,560,378.75	\$ 9,237,135.09	\$ 10,090,028.89	\$ 11,172,407.46	\$ 12,555,156.12	\$ 14,332,761.30	\$ 16,631,540.40	\$ 19,620,830.83	\$ 23,528,224.92	\$ 28,660,342.66
C3	Rent	Car	NI	\$ 5,069,941.36	\$ 5,700,725.93	\$ 6,490,726.65	\$ 7,487,093.34	\$ 8,752,195.96	\$ 10,368,805.81	\$ 12,447,103.89	\$ 15,134,176.95	\$ 18,626,904.52	\$ 23,189,473.98	\$ 29,177,218.62
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C5	Buy	No Car	NI	\$ 6,825,079.79	\$ 7,480,965.12	\$ 8,289,598.39	\$ 9,293,514.05	\$ 10,548,281.79	\$ 12,128,742.65	\$ 14,124,676.64	\$ 16,668,398.85	\$ 19,924,957.56	\$ 24,115,846.99	\$ 29,535,473.52
C6	Buy	No Car	\$1500	\$ 9,635,903.52	\$ 10,167,825.54	\$ 10,819,100.42	\$ 11,621,992.29	\$ 12,618,509.11	\$ 13,863,427.74	\$ 15,428,434.92	\$ 17,407,640.67	\$ 19,924,957.56	\$ 23,143,994.00	\$ 27,281,340.17
C7	Buy	Car	NI	\$ 6,686,368.74	\$ 7,308,186.72	\$ 8,072,691.98	\$ 9,019,056.74	\$ 10,198,297.62	\$ 11,677,077.44	\$ 13,542,777.52	\$ 15,910,277.78	\$ 18,931,031.26	\$ 22,805,243.08	\$ 27,798,216.14
C8	Buy	Car	\$1500	\$ 9,497,192.46	\$ 9,995,061.13	\$ 10,602,194.01	\$ 11,347,534.98	\$ 12,268,524.94	\$ 13,413,762.52	\$ 14,846,535.79	\$ 16,649,519.05	\$ 18,931,031.25	\$ 21,833,390.09	\$ 25,544,082.77

Overall best case
until MARR<8

Worst
case

Best Case

Concluding Analysis

- If $MARR < 8\%$, Case 6 (Buy House, Public Transport, Invest) is the favored decision to make as it returns the highest future worth.
- If $MARR > 8\%$, Case 1 (Rent, Public Transport, No Invest) is the favored decision
- All of the cases favored taking public transport

Conclusion

- To create financial estimates and analyze each person's financial situation, we adjusted and controlled a variety of cash flows.
- Examined and assessed many economic scenarios in cases and made thoughtful judgments that would provide financial stability.
- Time value of money principles were applied to cash flows to determine the future worth of investments.

Thank You