Buying a Car

Cars: toilets or works of art?
Look cool and be smart at the same time
Financing options

Choosing the car you want/need

- How do you see your car?
  - Just something to be used – like a toilet
    - Utilitarian – takes you from place to place in the most efficient means possible
  - As a work of art that needs to be pampered and lovingly cared for
    - An expensive toy that you want to play with
    - Something that makes you look cool
    - Some of this module may not apply to you

Which is it?

Listen to your head or your heart?

- Do your research
  - *Consumer Reports* has an annual car issue
    - Doesn't accept money from car manufacturers
    - Rates the cars on many attributes (including repair frequency)
    - Definitely NOT for a "motor head"
  - *Car and Driver, Road and Track, Motor Trend*
    - Do accept money from car manufacturers
    - Lots of road tests, comparison tests
    - Definitely for a "motor head"

More research

- Visit dealerships (I prefer to do this on a Sunday)
- Ask around
- "Build it" on-line – see option packages
  - Options make the car but can really bump up the cost
  - Optional windshield, brakes, heated seats, sun-roof
- Analyze your needs
  - Sports car
  - Basic transportation
  - Status symbol
  - SUV

Avoid valet parking

The humiliation of valet parking.

Narrow it down

- Sports car
  - Miata, Boxster, Mini, Z4, Wrangler
- Basic transportation
  - Civic, Accord, Camry, Neon
- Status symbol
  - BMW 3, Audi A6, Lexus, Acura
- SUV
  - Hummer, Tahoe, Explorer, Pathfinder, Jeep

New or used?

- New car
  - **Average new car loses 20% of its value the instant you drive it off the lot**
    - Your new $40,000 car is worth $32,000 the next day
  - New cars have less repair problems and come with better warranties than used cars
- "Pre-owned" (aka USED)
  - Obviously cheaper for the same model
  - Won't decline nearly as much in price
    - More expensive to buy from a dealer but may have less repair problems and a better warranty than buying privately
  - Try to find out why the former owner is selling it
    - Take it to a mechanic before buying – if owner resists, walk away
- How long do you plan to own the car?
  - 1 or 2 years – go used; 3 or more – new if you can afford it

How are you going to pay for it?

- Cash – how realistic is this?
  - Great if you can pay cash
  - Not a great idea to finance an asset that
    - Depreciates in value
    - Falls apart before it's paid off
- Finance it – the rest of us
  - Good way to establish your credit rating
  - Buy it with a loan
  - Lease it

Car loans

- Down payment (what you can afford to pay now)
- Monthly payment (max of 20% of your monthly net income)
- Let's assume $4,000 down and **$400** per month
  - If interest rate = **9%**/yr, you can borrow **$12,579** with a **3**-year loan, $16,074 with a 4-year loan and $19,269 with a 5-year loan
  - If interest rate = 5%/yr, $13,346 (3-yr), $17,369 (4-yr) and $21,196 (5-yr)
- PV=400($PVIF_a$-9/12%-3x12) = **$12,579**

Computing your loan payment

- Formula will give you the ***exact*** *same loan amount* as the car dealer calculates for you
- PV_0 = PMT ($PVIF_a$ – i% - n)
  - i is interest rate **per month** (APR/12)
  - n = number of **months** for the loan
  - PMT is the **monthly** payment
  - PV_0 is the amount of the loan (amount you borrow from the dealer or the bank)
  - Calculator buttons: 9/12=.75=>i 36=>n 400=>PMT solve PV = $12,579

Know 3 – find the 4th

- PV_0 = PMT ($PVIF_a$ – i% - n)
- Given PMT, i and n, you can find PV_0
  - What we just did – max loan possible
- Given PV_0, i and n, you can find PMT
  - You "need" PV_0 to buy the car; what's it going to cost you each month?
- Given PV_0, **-(**PMT**)** and n, we can find monthly i (multiply i by 12 = APR)
  - What interest rate is the lender charging you?

Use Excel for “what-if” analysis

- Excel is perfect for doing “what-if” analysis for car loans
- Excel has built-in PMT, PV, RATE functions
- In the next two examples, we use the PMT and PV functions and set up two tables
- Easy to see the effect of changing the down payment or the monthly payment

What-if with Excel

What if with Excel						
Price of the car	50000					
Down payment	10000					
Loan amount	40000					
		APR - Interest Rate				
	Years	**5%**	**6%**	**7%**	**8%**	**9%**
	3	1,199	1,217	1,235	1,253	1,272
	3.5	1,040	1,058	1,077	1,095	1,114
	4	921	939	958	977	995
	4.5	829	847	866	884	904
	5	755	773	792	811	830
	5.5	694	713	732	751	771
	6	644	663	682	701	721

What-if with Excel II

What if with Excel						
Monthly payment	$ 500					
Amount borrowed						
		APR - Interest Rate				
	Years	**5%**	**6%**	**7%**	**8%**	**9%**
	3	16,683	16,436	16,193	15,956	15,723
	3.5	19,229	18,899	18,578	18,264	17,957
	4	21,711	21,290	20,880	20,481	20,092
	4.5	24,133	23,611	23,104	22,612	22,134
	5	26,495	25,863	25,251	24,659	24,087
	5.5	28,799	28,048	27,325	26,627	25,953
	6	31,046	30,170	29,327	28,517	27,738

Other considerations

- Insurance, gas, tires (don't skimp on brakes and tires), repairs
- Warranties
  - Avoid extended warranties and service contracts
    - Get it serviced regularly (not at dealer unless under warranty)
    - Not worth it since standard warranties are long enough
- Selling your old car
  - Sell it yourself and get more but it's a hassle
  - Go to kellybluebook.com (kbb.com) for trade-in and private sale values – depressing
  - **Your old car will always be worth more to you than to someone else**

How to shop

- If possible visit 3 or 4 dealerships that sell what you want and let them know this
- Buying at the end of the model year could save you big bucks – poorer selection and it's a year old already when it comes to resale value
- Go near the end of the month – salesmen need to meet quotas
- Window sticker is "suggested retail price" which is meaningless
  - Go to kbb.com to find the dealer's cost and add 3-4% (<20,000) or 6-7% (>20,000) to get your offering price

Negotiating price

- Get a firm price quote independent of how you will pay for the car
  - Price should not depend on trade-in or means of financing
    - These are separate issues – get the price first
- Dealer may offer choice: rebate vs. lower interest rate
  - $1,000 rebate or a 5% interest rate on a $10,000 4-year loan (normal rate is 10%)

Rebate or lower rate

- 10,000 = PMT_{Dealer} ($PVIF_a$–5/12–4x12)
  - PMT_{Dealer} = $230/month
- 10,000 = PMT_{Bank} ($PVIF_a$–10/12–4x12)
  - PMT_{Bank} = $254/month
- Savings = (254-230)x48=1,152 and 1,152>1,000 so take the lower rate – ignores TVM
- Savings = (254-230)($PVIF_a$–10/12–4x12) or $946<1,000 so take rebate
- Remember, this is $152 or $54 spread over 4 years – who the heck cares!

Leasing vs. buying

- Leasing (About 25% of all new cars)
  - Renting your car for 2 to 5 years – you own nothing when lease is up – but (most leases) allow you to walk away even if market value < residual value
  - Lower monthly payments - get more car for the money
  - Lower down payment
- Buying
  - Higher monthly payments but you own the car at the end of the loan
  - Usually cheaper way to go

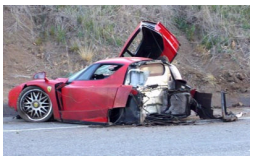
How leasing works

- Lease payment depends upon:
  - Purchase price of the car
  - Forecasted residual value at the end of lease
  - Financing (interest) rate
  - Term of the lease
- You finance the depreciation over the lease term
  - Depreciation = Purchase price – residual value
- Payment = depreciation + sales tax + interest to the car dealer

Lease characteristics

- Most leases have a **purchase option** so you can buy the car at lease's end
  - At a fixed price (best)
  - At the market price
  - At the residual value
- Be wary of hidden costs of leasing
  - Acquisition fee – setting up the lease
  - Disposition fee – dealer prep on car for resale
  - Per mile fee if you exceed max allowable mileage
  - Early termination fee – applies even if wrecked

Early termination fee



Payment calculators

- For help on the lease vs. buy question, visit:
  - www.bankrate.com (calculators)
  - www.financenter.com (consumer site)

Lease vs. buy summary

- Buying is cheaper than leasing
  - Own the car at the end of the loan
- For a given car, leasing gives you a lower monthly payment
  - For a given monthly payment, you can get more car by leasing
- Both this is short-sighted – in the end, buying with a loan will save you money

Some of my car experience

- Once paid $4,400 for a new Corvette and rolled it over in a corn field on a snowy Lafayette weekend
- Drove the same Jeep CJ7 from 1978 to 1996
  - Forced to sell with the arrival of my first child
- Bought a new Porsche 911 in 1982 with 60 $550 monthly payments
  - Paid off loan 2 months early (decided to grow up)
- 10 days later traded for another Porsche
  - 60 $780 payments (>rent) – still drive it 20+ yrs later