

Week 1 Discussion Post

Hi All,

I am Kartik Patath I live in San Jose, CA. I am a second year graduate student of MS in Robotics program from Worcester Polytechnic Institute. I am currently doing an internship at Honda Research Institute, USA. This my first business course and probably my last course to complete my master's degree at WPI. I previously worked at NASA, JPL as an international student intern and I had been a research fellow at the Robotics Institute of Carnegie Mellon University. I have banked several projects throughout my career and I joined the Engineering Management degree anticipating that it will strengthen my ability to lead projects in a concrete and systematic approach.

Best,

Kartik

Week 3 Discussion

Topic 1:

Growth technology companies typically do not issue dividends to their shareholders. Their argument is that their IRR is much higher than the historical Wall Street growth indices, and their earnings are better invested into new products. If we assume that share prices grow at the same rate as a company's IRR, how many years would it take to double your share price if you invested in a growth company's shares? Each participant should have a unique set of IRR ($i\%$) and number of years (n) values to enter into the discussion board for doubling your investment.

Initial Price	$\rightarrow P$	after	1 yr \rightarrow Price $\rightarrow P(i+1)$
IRR	$\rightarrow i\%$		2 yrs \rightarrow Price $\rightarrow P(i+1)^2$
no. of years	$\rightarrow n$		3 yrs \rightarrow Price $\rightarrow P(i+1)^3$
			\vdots
			n yrs \rightarrow Price $\rightarrow P(i+1)^n$

Also,

Double the share price $\rightarrow 2P$

Now $2P = P(i+1)^n$

$$\Rightarrow 2 = (i+1)^n$$

$$\Rightarrow \ln(2) = n \ln(i+1)$$

$$\Rightarrow \boxed{n = \frac{\ln(i+1)}{\ln(2)}} \rightarrow \text{relation btwn } i \text{ \& } n$$

i	n (no. of yrs)
1%	1
2%	1.5849
3%	2
4%	2.3219
5%	2.5849
6%	2.8073
7%	3

Topic 2:

One of the major concerns for middle-aged folks is when to retire and start receiving social security payments. The Social Security Administration (SSA) gives you the following guidelines:

1. Retire at age 62. SSA payments are reduced by 25 percent, and you can only earn less than \$14,000/year before further reduction of your payments.
2. Retire at 66 (full retirement age). You can also continue to work and earn as much as you want with no penalties. Typical yearly SSA payments for engineers are \$20,000 to \$30,000/year.
3. Retire at 70, and SSA payments will increase by 25 percent.

The decision is obviously dependent on the life expectancy of the person and the expected future interest (inflation) rate. Each participant should use a different inflation rate ($i\%$) or consumer purchasing index or (CPI) to advise whether to retire at 62, 66, or 70 based on the person's life expectancy. Indicate the age where there is a breakeven between any two of the three choices. You can choose 0 percent, low or hyper-inflation $i\%$ rates, or half-percent increments not in the tables, depending on your outlook for the economy into the future.

last 2 digits $\rightarrow 99$

\therefore initial value $\rightarrow \$29,500$

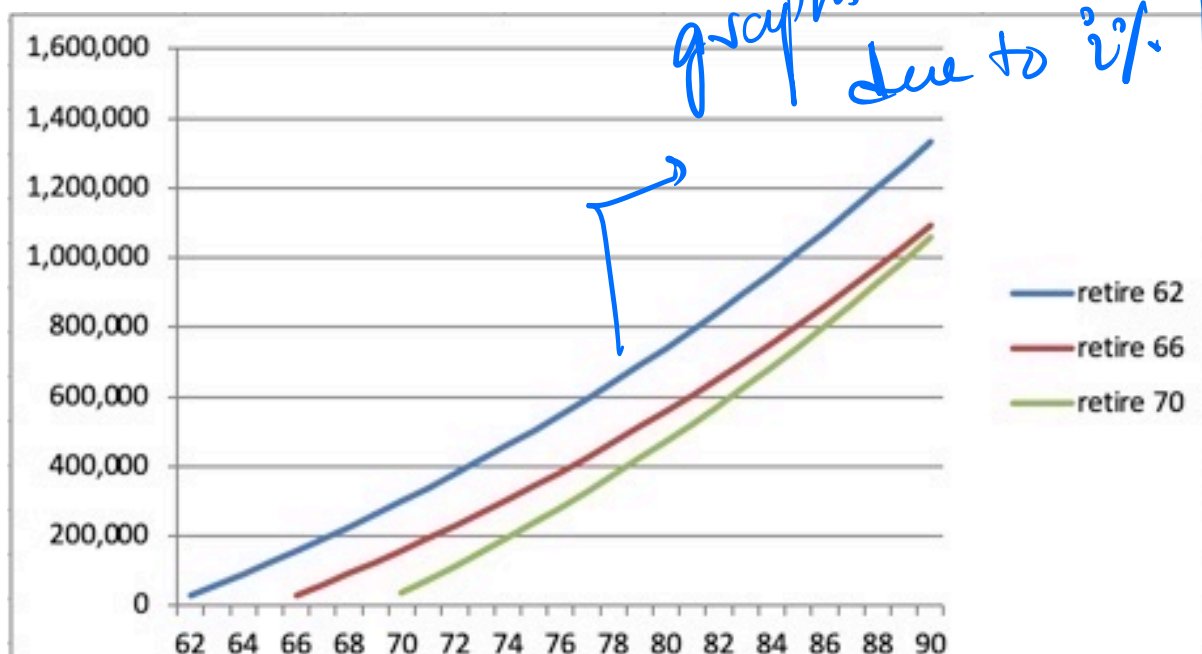
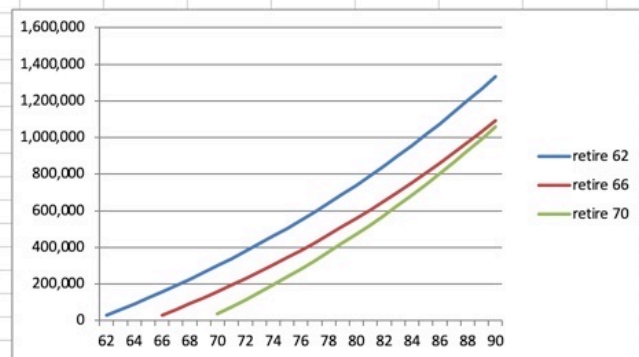
\therefore inflation $\rightarrow 2.9\%$

25% of \$29,500 is \$7,375

$$FV = PV \cdot (2.9 + 1)^n$$

Plugging in the values of FV & PV in XL
Sheet we get the following results.

Age (yrs)	retire 62	CUM retire 62	retire 66	CUM retire 66	retire 70	CUM retire 70	n	3%
62	29,500	29,500						
63	30,385	59,885					1	1.03
64	31,297	91,182					2	1.0609
65	32,235	123,417					3	1.092727
66	33,203	156,620	30,000	30,000			4	1.125509
67	34,199	190,818	30,900	60,900			5	1.159274
68	35,225	226,043	31,827	92,727			6	1.194052
69	36,281	262,324	32,782	125,509			7	1.229874
70	37,370	299,694	33,765	159,274	36,875	36,875	8	1.26677
71	38,491	338,184	34,778	194,052	37,981	74,856	9	1.304773
72	39,646	377,830	35,822	229,874	39,121	113,977	10	1.343916
73	40,835	418,665	36,896	266,770	40,294	154,271	11	1.384234
74	42,060	460,725	38,003	304,773	41,503	195,774	12	1.425761
75	43,322	504,047	39,143	343,916	42,748	238,523	13	1.468534
76	44,621	548,668	40,317	384,234	44,031	282,553	14	1.51259
77	45,960	594,628	41,527	425,761	45,352	327,905	15	1.557967
78	47,339	641,967	42,773	468,534	46,712	374,617	16	1.604706
79	48,759	690,726	44,056	512,590	48,114	422,731	17	1.652848
80	50,222	740,948	45,378	557,967	49,557	472,287	18	1.702433
81	51,728	792,676	46,739	604,706	51,044	523,331	19	1.753506
82	53,280	845,956	48,141	652,848	52,575	575,906	20	1.806111
83	54,879	900,835	49,585	702,433	54,152	630,058	21	1.860295
84	56,525	957,360	51,073	753,506	55,777	685,835	22	1.916103
85	58,221	1,015,581	52,605	806,111	57,450	743,285	23	1.973587
86	59,967	1,075,548	54,183	860,295	59,174	802,459	24	2.032794
87	61,766	1,137,315	55,809	916,103	60,949	863,407	25	2.093778
88	63,619	1,200,934	57,485	973,587	62,777	926,185	26	2.156591
89	65,528	1,266,462	59,208	1,032,794	64,661	990,845	27	2.221289
90	67,494	1,333,956	60,984	1,093,778	66,600	1,057,445	28	2.287928



graphs are exponential
due to i%. $[1+i]^n$

We can observe a
break even at 89/90 yrs
btwn 66 & 70 yr retirements

Where as

a break even btwn
62 & 66/70 is hard to
attain within 90yrs

Week 2 Discussion Post

3. Give examples of patent wars in the electronics/communications industry and what is the reason for their frequent occurrence?

The U.S. Patent System was originally intended to help protect the inventor's ideas and the market share that idea might generate in a particular industry, thereby also promoting technological prosperity and progress. The current patent system, however, is "marked by limitless subject matter and lenient public grant" leading to the abuse of patents by the mobile device manufacturing industry. The abuse of patents is a common occurrence in the present day as the innovation curve is not very steep but the demand for newer technologies keeps increasing as the market craves for a new commodity. That said, there is a phase when multiple companies try to work on the same technology and by some reason one of those companies tries to pull off a certain technology faster than its competitors. Now, the problem here is the competitors might have spent substantial resources in developing a certain technology and now it has to go in vain, as someone has already patented this work. In order to save their own efforts the competitors try to find a loophole in the existing patent phrases and try to claim their own variant of the patent for the same technology, which leads to a **Patent war**. For example:

The most famous patent war in the last decade is the "Smartphone Patent War" and it involved many tycoons such as Apple, Google, Samsung, Microsoft, Nokia, Motorola, HTC. A whale among those is the **Apple vs Samsung** patent war. This particular dispute between Apple and Samsung began in April 2011, when Apple filed a design patent infringement claim against Samsung, alleging that Samsung had violated Apple's Design Patent No. D618677 ('677 Patent), which protects the general shape and appearance of its popular iPhone. In particular, one of Apple's claims was against Samsung's Galaxy S 4G and Infuse 4G phones which arguably appear similar in their rounded edges and screen position and so Apple sought a preliminary injunction to prohibit sales of those Samsung devices. Samsung responded to Apple's actions by bringing patent infringement countersuits in U.S. Federal Court against Apple relating to wireless network technology. Continued strike and counter strike escalated the initial dispute into a patent battle in just four months and by August 2011, there were 19 ongoing lawsuits between the 2 companies in 12 courts across 9 countries on 4 continents.

References:

1. <http://www.nytimes.com/2012/07/30/technology/apple-samsung-trial-highlights>
2. Chloe Albanesius, *Every Place Samsung and Apple Are Suing Each Other*, PC MAGAZINE (Sep. 14, 2011, 12:59 PM), <http://www.pcmag.com/article2/0,2817,2392920,00.asp>.
3. *Apple, Inc. v. Samsung Electronics Co., Ltd.*, No. 11-CV-01846-LHK, 2011 WL 7036077 (N.D. Cal. Dec. 2, 2011).
4. U.S. Patent No. D618677 (filed Nov. 18, 2008), available at <http://www.google.com/patents/USD618677>.