



COSTCO CLINIC: INVESTMENT ANALYSIS

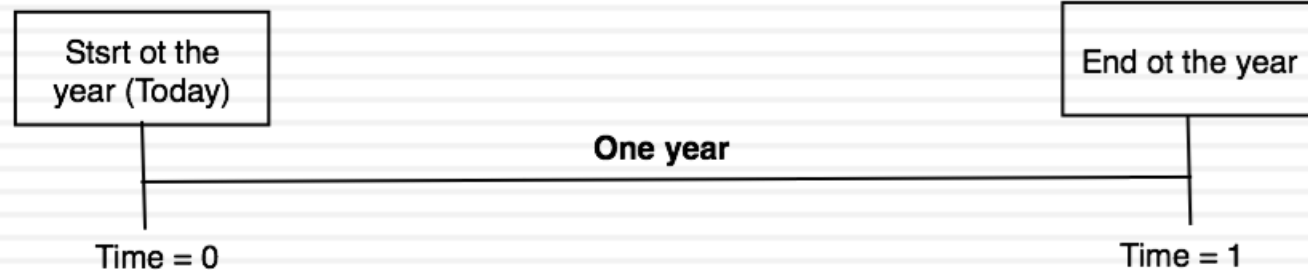
A healthy discussion!

Discrete and Continuous Time

The Real World

Most of your cash flows occur over the entire year. Revenues and operating expenses are spread over the year, though there may be "seasonal" factors

Some of your cash flows (tax payments, debt payments) occur at discrete intervals (every quarter or month)



The PV World

The Discrete Time World: Cash flows are assumed to occur at a point in time.

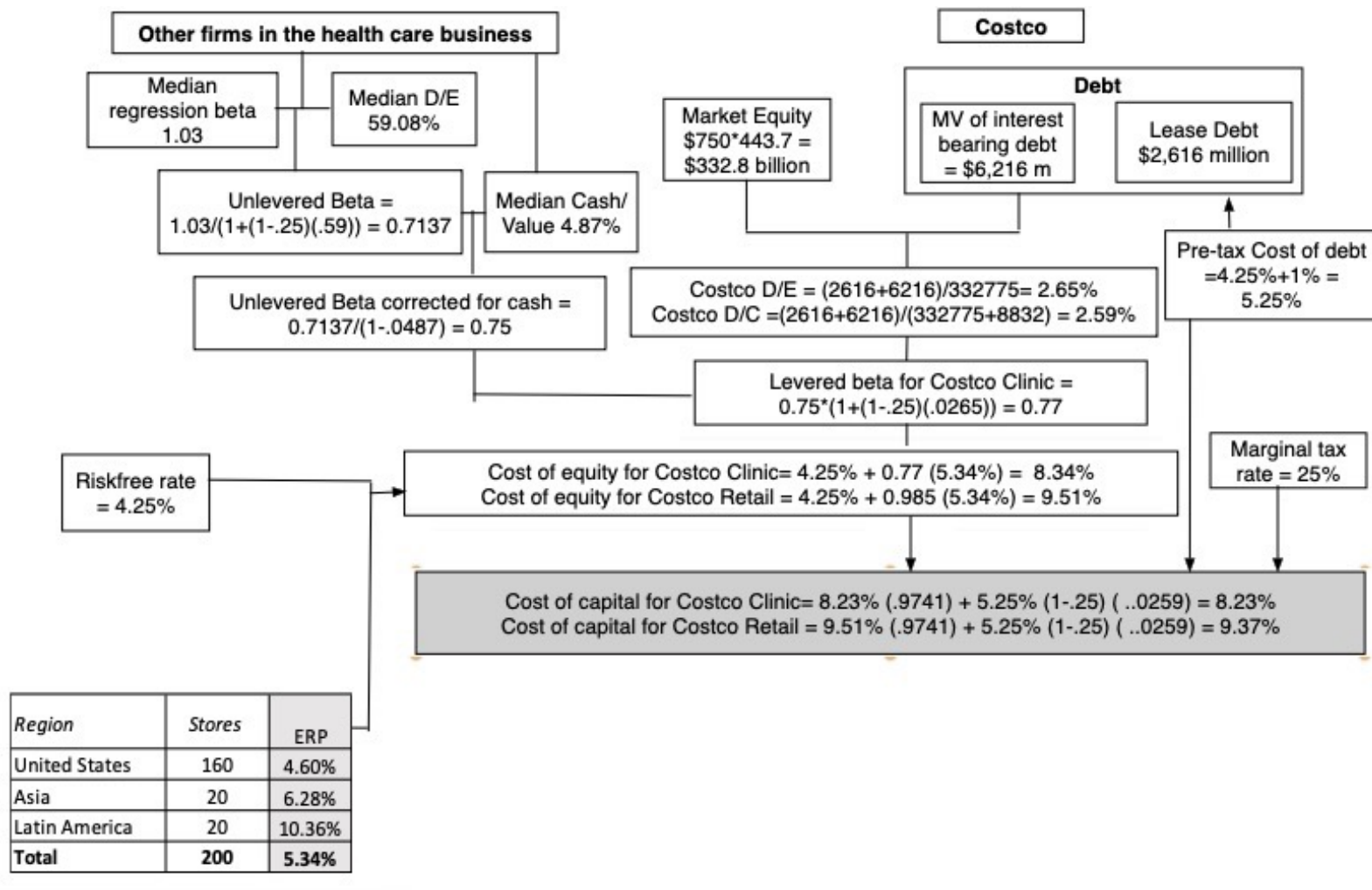
The Accounting World

The Accounting World: Revenues, earnings and expenses occur in fiscal years

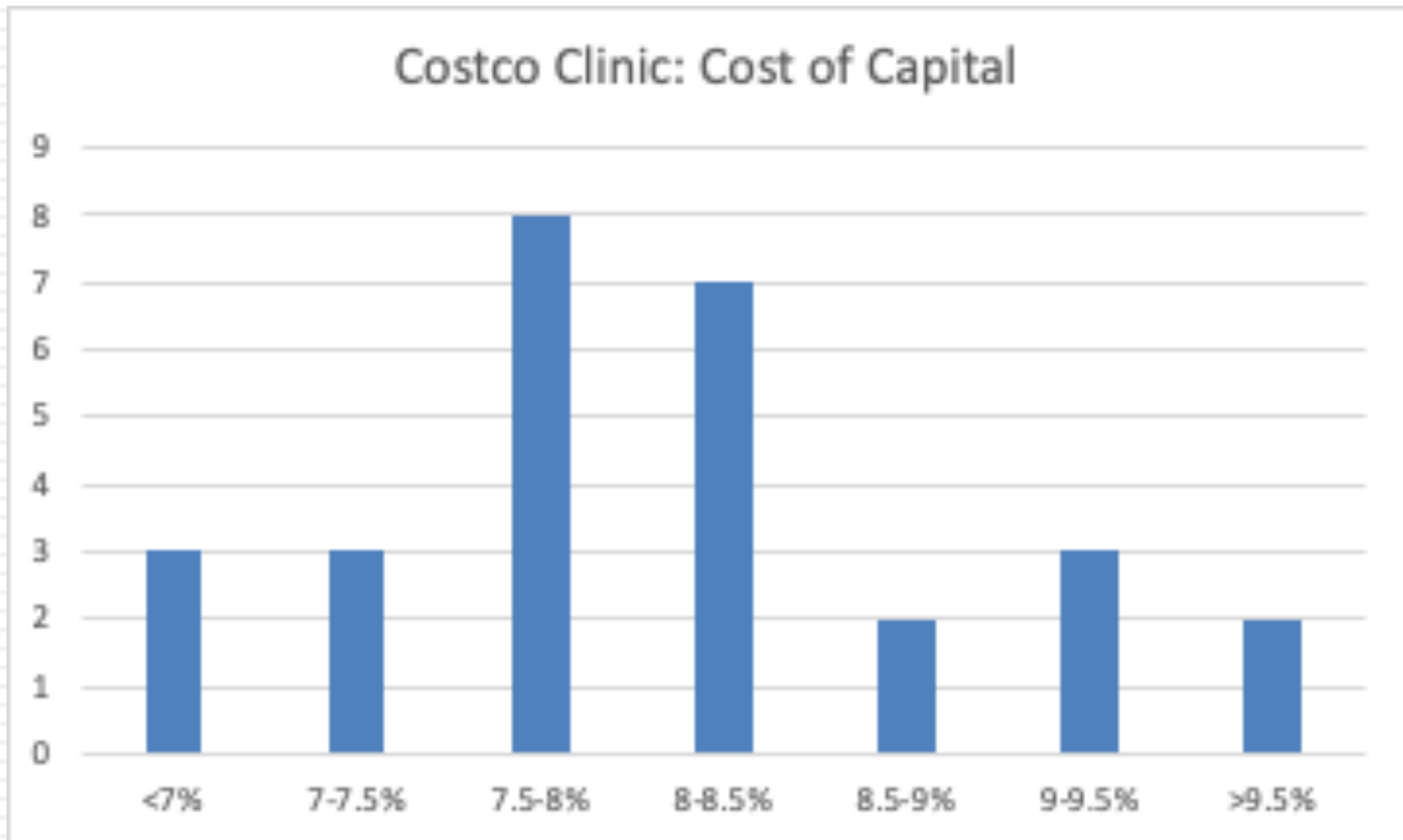
Summary of Conclusions

- Based upon the riskiness of this project and Costco's debt to equity ratio of 2.65%, the beta for this project, when fully operational, is 0.77, the cost of equity is 8.34% and the cost of capital is 8.23%.
- From an accounting return standpoint, the return on capital computed using the average operating income (without allocated G&A) and capital invested over the period is about 4-7%, depending on what you include in book value, and whether you consider side costs & benefits. Eliminating the allocated G&A causes it to increase to 25%.
- The net present value of just the cash flows on the project, discounted at 8.15% (for most of the years..)
 - *is \$3,279 million, for a finite life of 15 years without counting side effects (lost sales at stores and synergy) & \$2,502 million, with side costs and benefits considered.*
 - *is \$ 8,648 million, under the assumption of an infinite life, with higher capital expenditures during the project life, without counting the side effects (lost sales at stores and synergies). With the side effects considered, the net present value is \$6,808 million.*
- The side costs of lost sales (from displaced cosmetics) exceed the side benefits of increased revenues at the stores with the clinics.
- **I would recommend accepting the investment. Notwithstanding lost cosmetics sales, the project generates significant value, and there may be the potential for added value from subscription growth.**

Cost of Capital Calculations



Cost of Capital: Your numbers

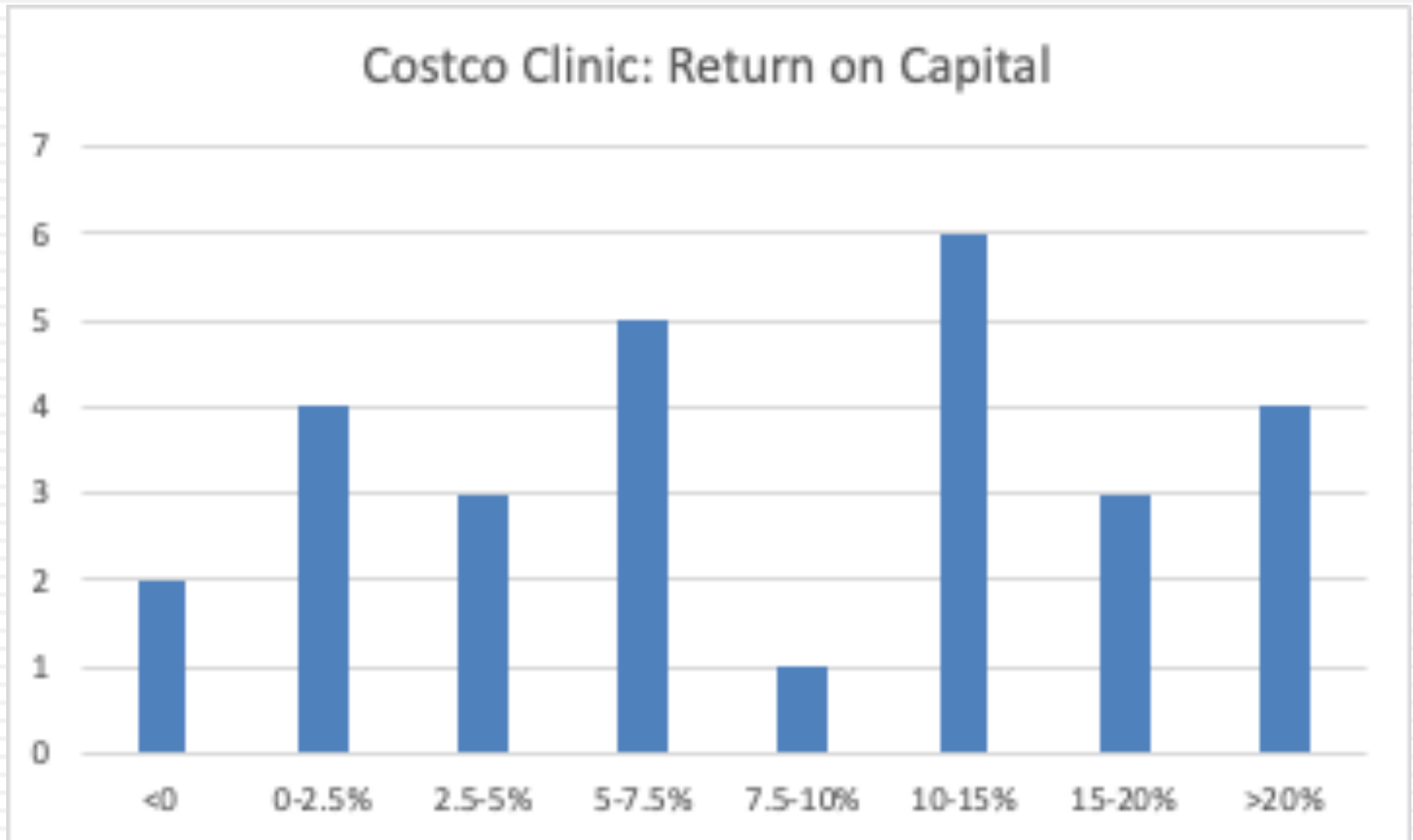


Return on Capital Computation

Year	Beginning Book Value	+ Capital Investments	- Depreciation	+ Investment in WC	Ending Book Value	Average Book Value	EBIT(1-t)	Return on Capital	EBIT(1-t)	Return on Capital
0	\$0	\$1,000	\$0	\$0	\$1,000	\$500			\$ -	
1	\$1,000	\$ 500	\$ -	\$ -	\$1,500	\$1,250	\$ -		\$ -	
2	\$1,500	\$ 500	\$ -	\$ -	\$2,000	\$1,750	\$ -		\$ -	
3	\$2,000	\$ 400	\$ 200	\$ 344	\$2,544	\$2,272	\$ (437.61)	-19.26%	\$ (474.01)	-20.86%
4	\$2,544	\$ 1,538	\$ 240	\$ 151.94	\$3,993	\$3,268	\$ (339.89)	-10.40%	\$ (392.36)	-12.00%
5	\$3,993	\$ 424	\$ 394	\$ 160.74	\$4,185	\$4,089	\$ (319.76)	-7.82%	\$ (389.25)	-9.52%
6	\$4,185	\$ 437	\$ 436	\$ 169.94	\$4,355	\$4,270	\$ (208.09)	-4.87%	\$ (295.58)	-6.92%
7	\$4,355	\$ 450	\$ 480	\$ 179.55	\$4,505	\$4,430	\$ (88.98)	-2.01%	\$ (195.47)	-4.41%
8	\$4,505	\$ 464	\$ 525	\$ 189.58	\$4,634	\$4,569	\$ 37.92	0.83%	\$ (88.65)	-1.94%
9	\$4,634	\$ 478	\$ 571	\$ 200.05	\$4,740	\$4,687	\$ 172.95	3.69%	\$ 25.20	0.54%
10	\$4,740	\$ 492	\$ 619	\$ 210.97	\$4,824	\$4,782	\$ 316.46	6.62%	\$ 146.38	3.06%
11	\$4,824	\$ (878)	\$ 668	\$ 222.38	\$3,500	\$4,162	\$ 468.84	11.26%	\$ 275.21	6.61%
12	\$3,500	\$ 522	\$ 580	\$ 234.27	\$3,676	\$3,588	\$ 734.29	20.46%	\$ 515.86	14.38%
13	\$3,676	\$ -	\$ 433	\$ 246.68	\$3,490	\$3,583	\$ 1,055.59	29.46%	\$ 811.04	22.63%
14	\$3,490	\$ -	\$ 393	\$ 69.30	\$3,167	\$3,328	\$ 1,110.02	33.35%	\$ 858.13	25.78%
15	\$3,167	\$ -	\$ 351	\$ 71.37	\$2,887	\$3,027	\$ 1,165.24	38.50%	\$ 905.79	29.93%
Average								7.33%		3.64%

Removing the allocated G&A from the mix increases the return on capital to 25-30%.

Your findings: Return on Capital



Finite Life case assumptions

□ Incremental Effects

- The money spent already is ignored for purposes of cash flow computation, since it is non-incremental.
- When analyzing the cost of the distribution system, we consider the cost of the system in year 4 (\$ 1,125 million) but we show the savings in year 11 (\$1,384 million). Similarly, for depreciation, we show the depreciation on the system of \$112.5 million from years 4-11, but show the differential depreciation between the two systems (-\$26 million) in years 9 & 10.
- **Since we are planning on wrapping up the business in 15 years, there is no need for significant capital maintenance expenditures.**
- Both working capital investments and store investments are assumed to occur at the start of the year and are therefore shown at the end of the previous year.

Expansion now or later?

	Last year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Capacity: Costco Retail	60.00%	63.00%	66.15%	69.46%	72.93%	76.58%	80.41%	84.43%	88.65%	93.08%	97.73%	102.62%	107.75%	113.14%	118.80%	124.74%
Capacity: Costco Clinic				20.00%	28.84%	38.19%	48.08%	58.53%	69.56%	81.20%	93.47%	106.41%	120.04%	134.39%	138.42%	142.58%
Expansion Investment					\$1,125.51							\$1,384.23				
Incremental Depreciation						\$112.55	\$112.55	\$112.55	\$112.55	\$112.55	\$112.55	\$112.55	-\$25.87	-\$25.87	-\$25.87	-\$25.87

What will happen if I take the investment?

- Run out of capacity earlier (in year 4)
- Spend \$1,126 million on new capacity in year 4
- Depreciate this straight line over 10 years

What will happen if I take the investment?

- Run out of capacity later in year 11
- Spend \$1,384 million on new capacity in year 11
- Depreciate this straight line over 10 years

What is the effect on present value?

- PV of spending earlier rather than later = $1126/1.0815^4 - 2498/1.0815^{11}$
- Depreciate the earlier investment starting in year 4 versus year 12

Incremental Cash Flows - Finite Life

Year	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Number of Clinics	-	-	-	50.00	70.00	90.00	110.00	130.00	150.00	170.00	190.00	210.00	230.00	250.00	250.00	250.00
Revenues per Clinic	\$ -	\$ -	\$ -	\$ 50.00	\$ 51.50	\$ 53.05	\$ 54.64	\$ 56.28	\$ 57.96	\$ 59.70	\$ 61.49	\$ 63.34	\$ 65.24	\$ 67.20	\$ 69.21	\$ 71.29
Revenues		\$ -	\$ -	\$ 2,500	\$ 3,605	\$ 4,774	\$ 6,010	\$ 7,316	\$ 8,695	\$ 10,149	\$ 11,684	\$ 13,301	\$ 15,005	\$ 16,799	\$ 17,303	\$ 17,822
- Direct Oper. Exp.		\$ -	\$ -	\$ 1,875	\$ 2,704	\$ 3,581	\$ 4,507	\$ 5,487	\$ 6,521	\$ 7,612	\$ 8,763	\$ 9,976	\$ 11,254	\$ 12,599	\$ 12,977	\$ 13,367
- Deprec'n		\$ -	\$ -	\$ 200	\$ 240	\$ 394	\$ 436	\$ 480	\$ 525	\$ 571	\$ 619	\$ 668	\$ 580	\$ 433	\$ 393	\$ 351
- Allocated & Incrm. G&A		\$ -	\$ -	\$ 845	\$ 946	\$ 1,052	\$ 1,165	\$ 1,283	\$ 1,408	\$ 1,540	\$ 1,678	\$ 1,824	\$ 1,978	\$ 2,139	\$ 2,226	\$ 2,317
- Advertising Exp.		\$ -	\$ -	\$ 164	\$ 169	\$ 174	\$ 179	\$ 184	\$ 190	\$ 196	\$ 202	\$ 208	\$ 214	\$ 220	\$ 227	\$ 234
EBIT		\$ -	\$ -	\$ (583)	\$ (453)	\$ (426)	\$ (277)	\$ (119)	\$ 51	\$ 231	\$ 422	\$ 625	\$ 979	\$ 1,407	\$ 1,480	\$ 1,554
Taxes		\$ -	\$ -	\$ (146)	\$ (113)	\$ (107)	\$ (69)	\$ (30)	\$ 13	\$ 58	\$ 105	\$ 156	\$ 245	\$ 352	\$ 370	\$ 388
EBIT(1-t)		\$ -	\$ -	\$ (438)	\$ (340)	\$ (320)	\$ (208)	\$ (89)	\$ 38	\$ 173	\$ 316	\$ 469	\$ 734	\$ 1,056	\$ 1,110	\$ 1,165
+ Deprec'n		\$ -	\$ -	\$ 200	\$ 240	\$ 394	\$ 436	\$ 480	\$ 525	\$ 571	\$ 619	\$ 668	\$ 580	\$ 433	\$ 393	\$ 351
+ Fixed Allocated Exp (1-t)		\$ -	\$ -	\$ 521	\$ 547	\$ 574	\$ 603	\$ 633	\$ 665	\$ 698	\$ 733	\$ 770	\$ 808	\$ 849	\$ 891	\$ 936
- Cap Ex	\$ 1,000	\$ 500	\$ 500	\$ 400	\$ 412	\$ 424	\$ 437	\$ 450	\$ 464	\$ 478	\$ 492	\$ 507	\$ 522	\$ -	\$ -	\$ -
- Opp. Cost of Logistics System		\$ -	\$ -	\$ -	\$ 1,126	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ (1,384)	\$ -	\$ -	\$ -	\$ -
- Chg in WC		\$ -	\$ 344	\$ 152	\$ 161	\$ 170	\$ 180	\$ 190	\$ 200	\$ 211	\$ 222	\$ 234	\$ 247	\$ 69	\$ 71	\$ -
+ Salvage Value																\$ 3,830
Cashflows to the firm	\$ (1,000)	\$ (500)	\$ (844)	\$ (269)	\$ (1,251)	\$ 54	\$ 215	\$ 384	\$ 564	\$ 754	\$ 954	\$ 2,550	\$ 1,354	\$ 2,268	\$ 2,322	\$ 6,282

Incremental Cash Flows – Finite Life (A More Direct Approach)

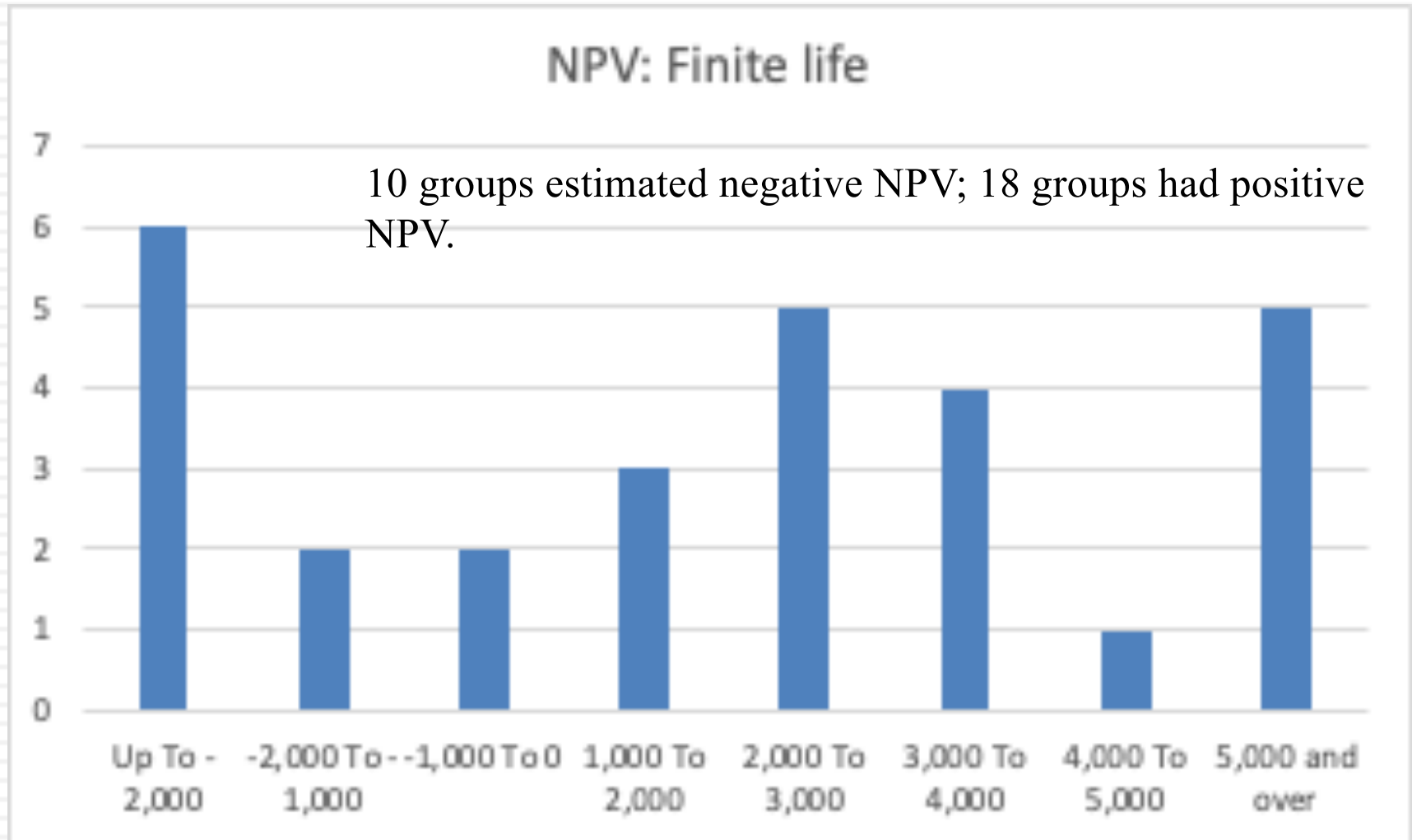
Year	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Revenues		\$ -	\$ -	\$ 2,500	\$ 3,605	\$ 4,774	\$ 6,010	\$ 7,316	\$ 8,695	\$ 10,149	\$ 11,684	\$ 13,301	\$ 15,005	\$ 16,799	\$ 17,303	\$ 17,822
- Direct Oper. Exp.		\$ -	\$ -	\$ 1,875	\$ 2,704	\$ 3,581	\$ 4,507	\$ 5,487	\$ 6,521	\$ 7,612	\$ 8,763	\$ 9,976	\$ 11,254	\$ 12,599	\$ 12,977	\$ 13,367
- Deprec'n		\$ -	\$ -	\$ 200	\$ 240	\$ 394	\$ 436	\$ 480	\$ 525	\$ 571	\$ 619	\$ 668	\$ 580	\$ 433	\$ 393	\$ 351
- Incremental G&A		\$ -	\$ -	\$ 150	\$ 216	\$ 286	\$ 361	\$ 439	\$ 522	\$ 609	\$ 701	\$ 798	\$ 900	\$ 1,008	\$ 1,038	\$ 1,069
- Advertising Exp.		\$ -	\$ -	\$ 164	\$ 169	\$ 174	\$ 179	\$ 184	\$ 190	\$ 196	\$ 202	\$ 208	\$ 214	\$ 220	\$ 227	\$ 234
EBIT		\$ -	\$ -	\$ 111	\$ 276	\$ 339	\$ 527	\$ 726	\$ 937	\$ 1,161	\$ 1,399	\$ 1,651	\$ 2,057	\$ 2,539	\$ 2,668	\$ 2,801
Taxes		\$ -	\$ -	\$ 28	\$ 69	\$ 85	\$ 132	\$ 181	\$ 234	\$ 290	\$ 350	\$ 413	\$ 514	\$ 635	\$ 667	\$ 700
EBIT(1-t)		\$ -	\$ -	\$ 83	\$ 207	\$ 255	\$ 395	\$ 544	\$ 703	\$ 871	\$ 1,049	\$ 1,238	\$ 1,542	\$ 1,904	\$ 2,001	\$ 2,101
+ Deprec'n		\$ -	\$ -	\$ 200	\$ 240	\$ 394	\$ 436	\$ 480	\$ 525	\$ 571	\$ 619	\$ 668	\$ 580	\$ 433	\$ 393	\$ 351
- Cap Ex	\$ 1,000	\$ 500	\$ 500	\$ 400	\$ 412	\$ 424	\$ 437	\$ 450	\$ 464	\$ 478	\$ 492	\$ 507	\$ 522	\$ -	\$ -	\$ -
- Opp. Cost of Logistics System		\$ -	\$ -	\$ -	\$ 1,126	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ (1,384)	\$ -	\$ -	\$ -	\$ -
- Chg in WC		\$ -	\$ 344	\$ 152	\$ 161	\$ 170	\$ 180	\$ 190	\$ 200	\$ 211	\$ 222	\$ 234	\$ 247	\$ 69	\$ 71	\$ -
+ Salvage Value																\$ 3,830
Cashflows to the firm	\$ (1,000)	\$ (500)	\$ (850)	\$ (269)	\$ (1,251)	\$ 54	\$ 215	\$ 384	\$ 564	\$ 754	\$ 954	\$ 2,550	\$ 1,354	\$ 2,268	\$ 2,322	\$ 6,282

The Value Effect: NPV

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Incremental Cash Flows	\$ (1,000)	\$ (500)	\$ (844)	\$ (269)	\$ (1,251)	\$ 54	\$ 215	\$ 384	\$ 564	\$ 754	\$ 954	\$ 2,550	\$ 1,354	\$ 2,268	\$ 2,322	\$ 6,282
Cost of capital	8.23%	8.23%	8.23%	8.23%	8.23%	8.23%	8.23%	8.23%	8.23%	8.23%	8.23%	8.23%	8.23%	8.23%	8.23%	8.23%
Cumulated Cost of capital	1.0000	1.0823	1.1713	1.2676	1.3719	1.4847	1.6068	1.7390	1.8820	2.0369	2.2044	2.3857	2.5819	2.7943	3.0242	3.2729
PV of Cash Flows	\$ (1,000)	\$ (462)	\$ (720)	\$ (212)	\$ (912)	\$ 36	\$ 133	\$ 221	\$ 300	\$ 370	\$ 433	\$ 1,069	\$ 525	\$ 811	\$ 768	\$ 1,919
Net Present Value	\$ 3,279															
Internal Rate of Return =	15.76%															
<i>Side Costs and Benefits</i>																
Side Costs	\$ -	\$ -	\$ -	\$ (109)	\$ (158)	\$ (209)	\$ (263)	\$ (320)	\$ (380)	\$ (444)	\$ (511)	\$ (581)	\$ (656)	\$ (734)	\$ (756)	\$ (779)
Side Benefits	\$ -	\$ -	\$ -	\$ 72.88	\$ 105.09	\$ 139.17	\$ 175.20	\$ 213.27	\$ 253.46	\$ 295.87	\$ 340.60	\$ 387.75	\$ 437.42	\$ 489.72	\$ 504.41	\$ 519.54
Overall effect	\$ -	\$ -	\$ -	\$ (36.39)	\$ (52.48)	\$ (69.50)	\$ (87.49)	\$ (106.50)	\$ (126.57)	\$ (147.75)	\$ (170.08)	\$ (193.63)	\$ (218.43)	\$ (244.55)	\$ (251.88)	\$ (259.44)
PV @ Costco Retail WACC	\$ -	\$ -	\$ -	\$ (27.82)	\$ (36.68)	\$ (44.41)	\$ (51.12)	\$ (56.89)	\$ (61.82)	\$ (65.99)	\$ (69.45)	\$ (72.29)	\$ (74.57)	\$ (76.33)	\$ (71.89)	\$ (67.70)
Value of Side Effects =	\$ (776.96)															
Overall NPV =	\$ 2,502															

In computing the side benefits from store shopping, I used the pre-tax operating margin of 3.56% from the most recent year and discounted the net after-tax earnings change at Costco's retail cost of capital of 9.37%

Your findings... Finite Life NPV



Explanations for Infinite Life Case

- When extending the project life to infinity, I did make some changes to the assumptions about capital maintenance.
 - Starting in year 1, I start with capital maintenance, setting it equal to depreciation in each year, with an inflation adjustment. Thus to get capital maintenance in year 3 = $200 (1.03)^3 = \$219$ million.
 - Advertising expenses continue beyond year 15.
 - Working capital will continue to grow to keep up with revenues
- The side costs (from lost cosmetics sales) and benefits (from increased store sales) now continue in perpetuity as well.

Incremental Cash Flows- Infinite Life

Year	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Number of Clinics	-	-		50.00	70.00	90.00	110.00	130.00	150.00	170.00	190.00	210.00	230.00	250.00	250.00	250.00
Revenues per Store	\$ -	\$ -	\$ -	\$ 50.00	\$ 51.50	\$ 53.05	\$ 54.64	\$ 56.28	\$ 57.96	\$ 59.70	\$ 61.49	\$ 63.34	\$ 65.24	\$ 67.20	\$ 69.21	\$ 71.29
Revenues		\$ -	\$ -	\$ 2,500	\$ 3,605	\$ 4,774	\$ 6,010	\$ 7,316	\$ 8,695	\$ 10,149	\$ 11,684	\$ 13,301	\$ 15,005	\$ 16,799	\$ 17,303	\$ 17,822
- Oper. Exp.		\$ -	\$ -	\$ 1,875	\$ 2,704	\$ 3,581	\$ 4,507	\$ 5,487	\$ 6,521	\$ 7,612	\$ 8,763	\$ 9,976	\$ 11,254	\$ 12,599	\$ 12,977	\$ 13,367
- Deprec'n on new investment		\$ -	\$ -	\$ 200	\$ 240	\$ 394	\$ 436	\$ 480	\$ 525	\$ 571	\$ 619	\$ 668	\$ 580	\$ 433	\$ 393	\$ 351
- Deprec'n: Cap Mtnc				\$ -	\$ 22	\$ 47	\$ 88	\$ 131	\$ 177	\$ 226	\$ 278	\$ 333	\$ 392	\$ 436	\$ 456	\$ 470
- Allocated & Incrm. G&A		\$ -	\$ -	\$ 845	\$ 946	\$ 1,052	\$ 1,165	\$ 1,283	\$ 1,408	\$ 1,540	\$ 1,678	\$ 1,824	\$ 1,978	\$ 2,139	\$ 2,226	\$ 2,317
- Advertising Exp.		\$ -	\$ -	\$ 164	\$ 169	\$ 174	\$ 179	\$ 184	\$ 190	\$ 196	\$ 202	\$ 208	\$ 214	\$ 220	\$ 227	\$ 234
EBIT		\$ -	\$ -	\$ (583)	\$ (475)	\$ (473)	\$ (365)	\$ (250)	\$ (126)	\$ 5	\$ 144	\$ 292	\$ 587	\$ 972	\$ 1,024	\$ 1,084
Taxes		\$ -	\$ -	\$ (146)	\$ (119)	\$ (118)	\$ (91)	\$ (62)	\$ (32)	\$ 1	\$ 36	\$ 73	\$ 147	\$ 243	\$ 256	\$ 271
EBIT(1-t)		\$ -	\$ -	\$ (438)	\$ (356)	\$ (355)	\$ (274)	\$ (187)	\$ (95)	\$ 4	\$ 108	\$ 219	\$ 440	\$ 729	\$ 768	\$ 813
+ Deprec'n		\$ -	\$ -	\$ 200	\$ 262	\$ 440	\$ 524	\$ 611	\$ 702	\$ 797	\$ 897	\$ 1,001	\$ 973	\$ 869	\$ 848	\$ 821
+ Fixed Allocated Exp (1-t)		\$ -	\$ -	\$ 521	\$ 547	\$ 574	\$ 603	\$ 633	\$ 665	\$ 698	\$ 733	\$ 770	\$ 808	\$ 849	\$ 891	\$ 936
- Cap Ex	\$ 1,000	\$ 500	\$ 500	\$ 400	\$ 412	\$ 424	\$ 437	\$ 450	\$ 464	\$ 478	\$ 492	\$ 507	\$ 522	\$ -	\$ -	\$ -
- Capital Maintenance		\$ -	\$ -	\$ 219	\$ 270	\$ 456	\$ 521	\$ 590	\$ 665	\$ 745	\$ 832	\$ 925	\$ 828	\$ 635	\$ 594	\$ 548
- Opp. Cost of Dist'n System		\$ -	\$ -	\$ -	\$ 1,126	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ (1,384)	\$ -	\$ -	\$ -	\$ -
- Chg in WC		\$ -	\$ 344	\$ 152	\$ 161	\$ 170	\$ 180	\$ 190	\$ 200	\$ 211	\$ 222	\$ 234	\$ 247	\$ 69	\$ 71	\$ 71
+ Terminal Value																\$ 32,678
Cashflows to the firm	\$ (1,000)	\$ (500)	\$ (844)	\$ (487)	\$ (1,516)	\$ (391)	\$ (284)	\$ (173)	\$ (57)	\$ 65	\$ 192	\$ 1,708	\$ 625	\$ 1,741	\$ 1,842	\$ 34,629

The terminal value calculation

- I assumed a perpetual life.
 - Did I have to?
 - What are the alternatives?
- Cash flow to the firm in year 16
 - = EBIT (1-t) + Depreciation – Cap Ex – Change in WC
 - = \$ 813 + \$ 821 – \$ 866 - \$ 74 = \$ 1,708 million
 - (Capital expenditures exceed depreciation by the inflation rate)
- Terminal Value in year 10
 - = CF in year 16/ (Cost of capital –g)
 - = 1708/ (.0823-.03) = \$ 32,678 million

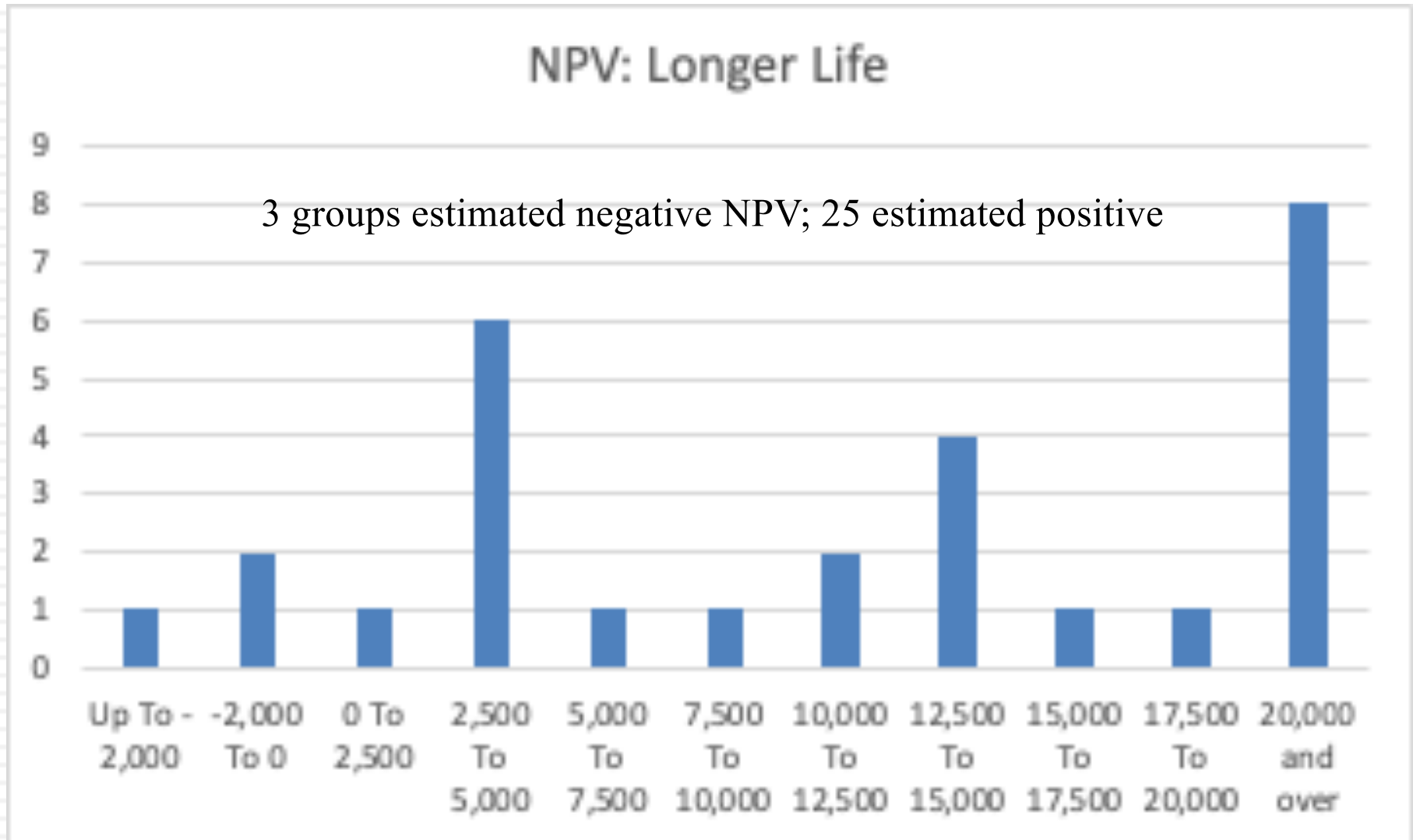
Finite versus Infinite: The Cash Flow Trade off

<i>Year</i>	<i>Finite</i>	<i>Infinite</i>	<i>Infinite minus Finite</i>
0	\$ (1,000)	\$ (1,000)	\$ -
1	\$ (500)	\$ (500)	\$ -
2	\$ (844)	\$ (844)	\$ -
3	\$ (305)	\$ (524)	\$ (219)
4	\$ (1,304)	\$ (1,568)	\$ (265)
5	\$ (15)	\$ (460)	\$ (445)
6	\$ 127	\$ (372)	\$ (499)
7	\$ 278	\$ (280)	\$ (557)
8	\$ 437	\$ (183)	\$ (621)
9	\$ 606	\$ (83)	\$ (689)
10	\$ 784	\$ 22	\$ (763)
11	\$ 2,356	\$ 1,515	\$ (842)
12	\$ 1,136	\$ 406	\$ (730)
13	\$ 2,023	\$ 1,497	\$ (526)
14	\$ 2,070	\$ 1,590	\$ (480)
15	\$ 2,193	\$ 1,691	\$ (502)
Ending Value	\$ 3,830	32678	\$ 28,848

Value Added: NPV of Infinite Life Case

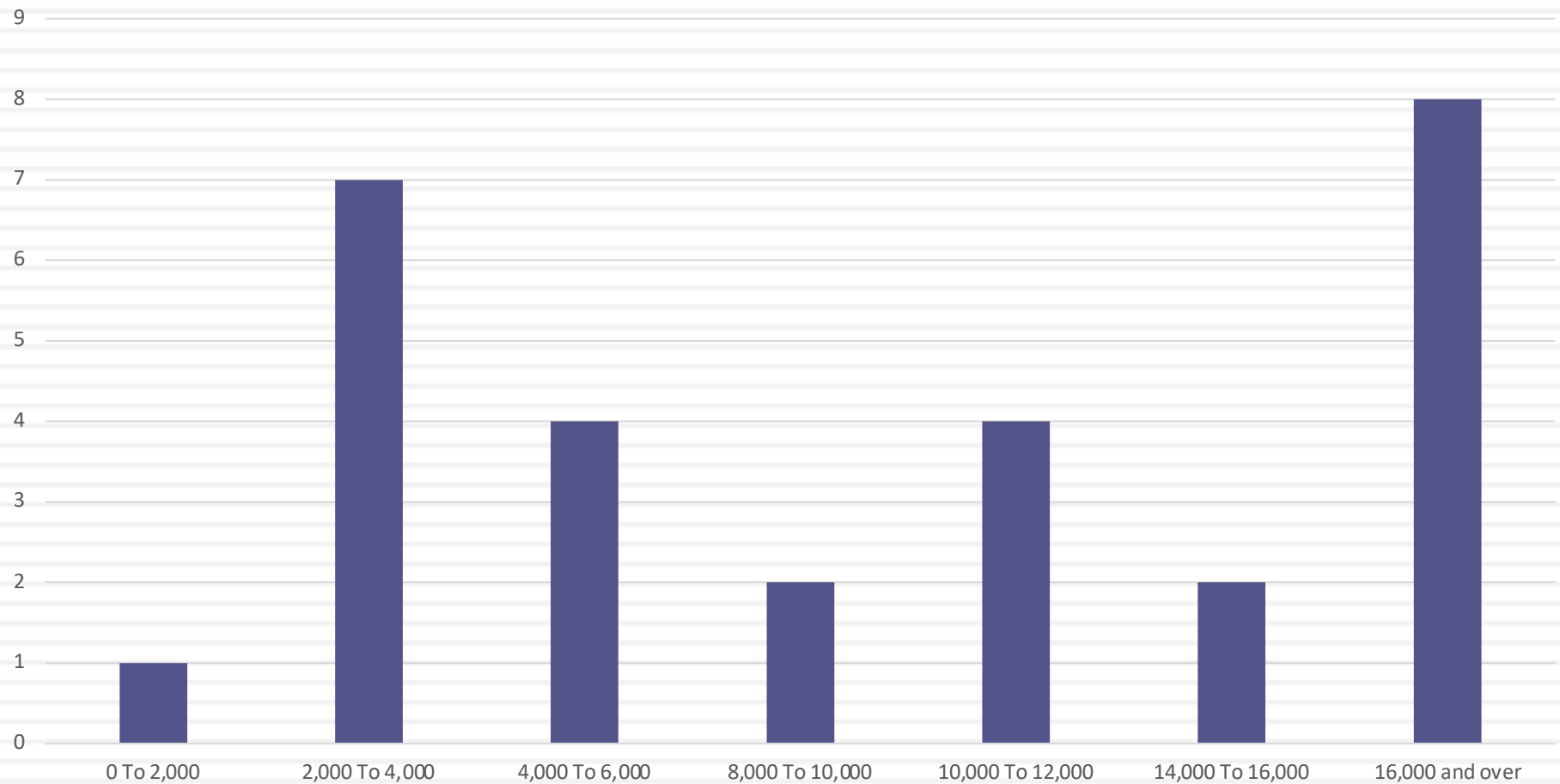
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Incremental Cash Flows	\$ (1,000)	\$ (500)	\$ (844)	\$ (487)	\$ (1,516)	\$ (391)	\$ (284)	\$ (173)	\$ (57)	\$ 65	\$ 192	\$ 1,708	\$ 625	\$ 1,741	\$ 1,842	\$ 34,629
Cost of capital	8.23%	8.23%	8.23%	8.23%	8.23%	8.23%	8.23%	8.23%	8.23%	8.23%	8.23%	8.23%	8.23%	8.23%	8.23%	8.23%
Cumulated Cost of capital	1.0000	1.0823	1.1713	1.2676	1.3719	1.4847	1.6068	1.7390	1.8820	2.0369	2.2044	2.3857	2.5819	2.7943	3.0242	3.2729
PV of Cash Flows	\$ (1,000)	\$ (462)	\$ (720)	\$ (384)	\$ (1,105)	\$ (263)	\$ (177)	\$ (100)	\$ (30)	\$ 32	\$ 87	\$ 716	\$ 242	\$ 623	\$ 609	\$ 10,580
Net Present Value	\$ 8,648															
Internal Rate of Return =	18.64%															
<i>Side Costs and Benefits</i>																
Side Costs	\$ -	\$ -	\$ -	\$ (109.27)	\$ (157.57)	\$ (208.67)	\$ (262.69)	\$ (319.77)	\$ (380.03)	\$ (443.62)	\$ (510.69)	\$ (581.38)	\$ (655.85)	\$ (734.27)	\$ (756.29)	\$ (778.98)
Side Benefits	\$ -	\$ -	\$ -	\$ 72.88	\$ 105.09	\$ 139.17	\$ 175.20	\$ 213.27	\$ 253.46	\$ 295.87	\$ 340.60	\$ 387.75	\$ 437.42	\$ 489.72	\$ 504.41	\$ 519.54
Net effect	\$ -	\$ -	\$ -	\$ (36.39)	\$ (52.48)	\$ (69.50)	\$ (87.49)	\$ (106.50)	\$ (126.57)	\$ (147.75)	\$ (170.08)	\$ (193.63)	\$ (218.43)	\$ (244.55)	\$ (251.88)	\$ (259.44)
Value in perpetuity																\$ (4,135.37)
PV @ Costco Retail WACC	\$ -	\$ -	\$ -	\$ (27.82)	\$ (36.68)	\$ (44.41)	\$ (51.12)	\$ (56.89)	\$ (61.82)	\$ (65.99)	\$ (69.45)	\$ (72.29)	\$ (74.57)	\$ (76.33)	\$ (71.89)	\$ (1,130.54)
Value of Side Effects =	-\$1,840															
Overall Project NPV =	\$ 6,808															

Your findings: Infinite Life



Effect of Lengthening Project Life

Effect of longer life on NPV



Investment consistency in growth and project life assumptions

After year 15

Capital Expenditure Assumption

Project ends

No (or very low) capital maintenance

Let assets run down towards end of life

Infinite life; $g=0\%$

Capital maintenance = Depreciation

Maintain invested capital at base level

Infinite life; $g = \text{inflation}$

Capital maintenance $>$ Depreciation

Capital invested has to grow at inflation rate

Infinite life; $g > \text{inflation}$

Capital investment to increase capacity

Capital maintenance $>$ Depreciation

Capital invested has to grow to reflect real growth

A Wrap Up and Summary

- Of the 28 groups that turned in numbers, 20 groups chose to invest, and 6 groups suggested rejection.
- There were at least three groups that had conditional decisions, i.e., reject with a 15-year life and accept with a longer life.
- If you believe in crowd wisdom, here was the crowd judgment on the key variables:

	<i>Cost of Capital</i>	<i>Return on Capital</i>	<i>NPV - 15 year</i>	<i>NPV - Longer Life</i>
Average	8.06%	10.96%	\$1,857	\$15,031
Median	7.97%	8.09%	\$2,174	\$12,378
High	9.50%	48.67%	\$15,512	\$46,690
Low	6.48%	-3.27%	-\$9,575	-\$6,259

- If you accepted the project, what is your biggest concern going forward?
- If you rejected the project, what is most likely to cause you to regret that decision?