Class 3: Value Systems

CS183Startup

logistics

TA office hours start today

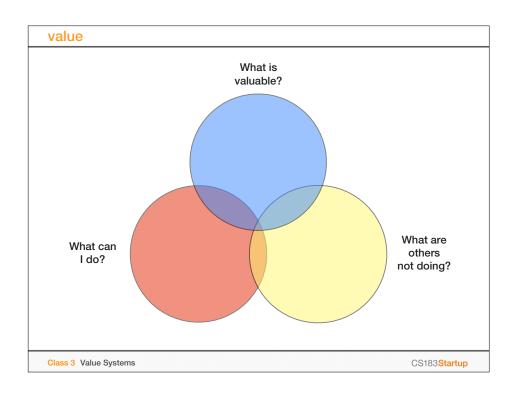
See Coursekit for supplementary materials

Assignment 1 posted later this week

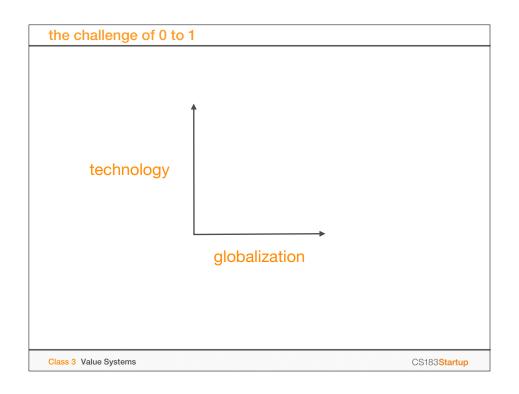
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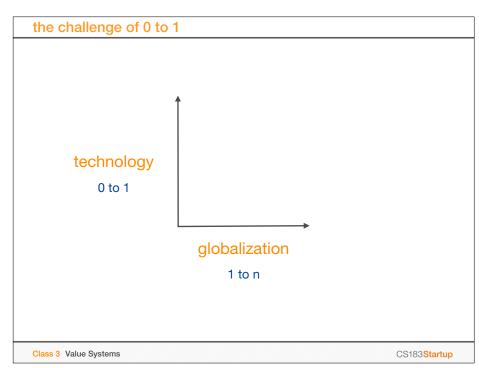
outline

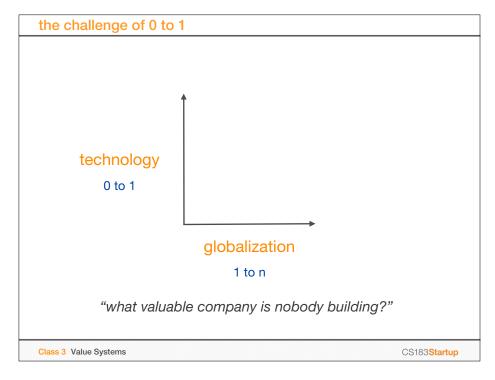
- 1. great technology companies
- 2. valuation
- 3. durability
- 4. capturing value
- 5. the ideology of competition



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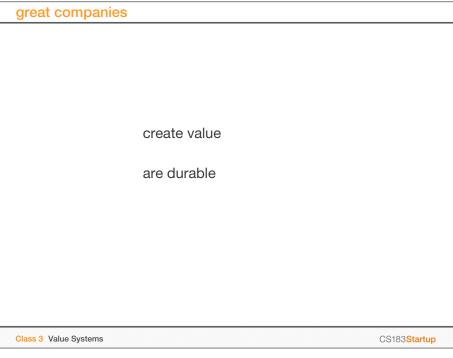








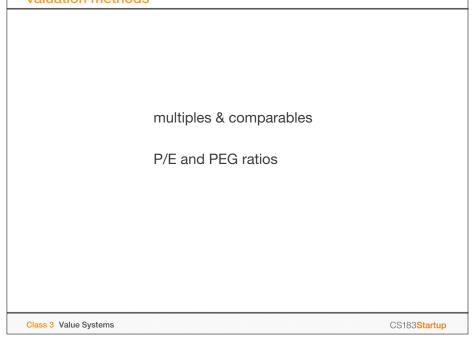
great companies	
create value	
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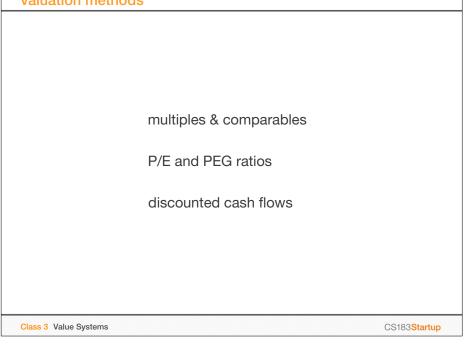


create value are durable capture value Class 3 Value Systems CS183Startup

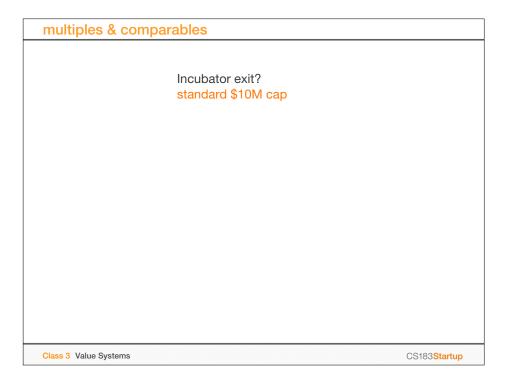
1. great technology companies
2. valuation
3. durability
4. capturing value
5. the ideology of competition

valuation methods	valuation methods
	multiples & comparables
Class 3 Value Systems CS183Startup Valuation methods	Class 3 Value Systems CS183Startup valuation methods

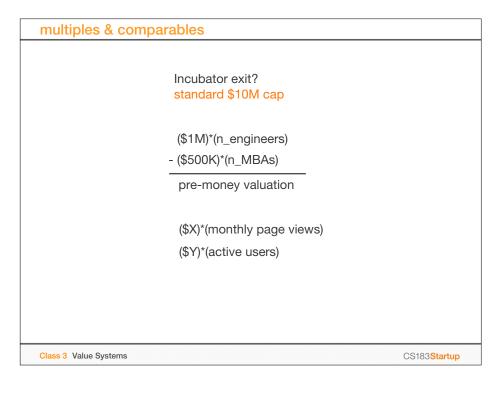




multiples & comparables	
Close 2 Value Statema	CC102Ct + 15
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Incubator exit? standard \$10M cap (\$1M)*(n_engineers) - (\$500K)*(n_MBAs) pre-money valuation



multiples & comparables

Incubator exit? standard \$10M cap

(\$1M)*(n_engineers) - (\$500K)*(n_MBAs)

7 (- - - 7

pre-money valuation

(\$X)*(monthly page views)

(\$Y)*(active users)

Revenue multiple

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P/E and PEG ratios

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P/E and PEG ratios

P/E and PEG ratios

adjust for growth

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P/E and PEG ratios

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P/E and PEG ratios

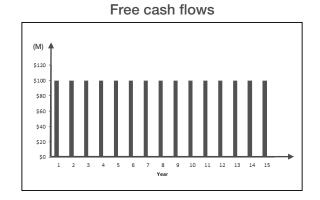
PEG ratio = Market value / Earnings
Annual earnings growth

Lower PEG ratio: cheaper
Higher PEG ratio: more expensive

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steady cash flows



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the time value of money

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the	time	val	ue o	of mo	nev
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r = discount rate

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the time value of money

r = discount rate

 $CF_t = free \ cash \ flow \ in \ year \ t$

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the time value of money

r = discount rate

 $CF_t = free \ cash \ flow \ in \ year \ t$

 $DPV = discounted \ present \ value$

the time value of money

r = discount rate

 $CF_t = free \ cash \ flow \ in \ year \ t$

 $\mathit{DPV} = \mathit{discounted}\ \mathit{present}\ \mathit{value}$

$$DPV_0 = \frac{CF_t}{(1+r)^t}$$

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the time value of money

r = discount rate

 $CF_t = free \ cash \ flow \ in \ year \ t$

DPV = discounted present value

$$DPV_0 = \frac{CF_t}{(1+r)^t}$$

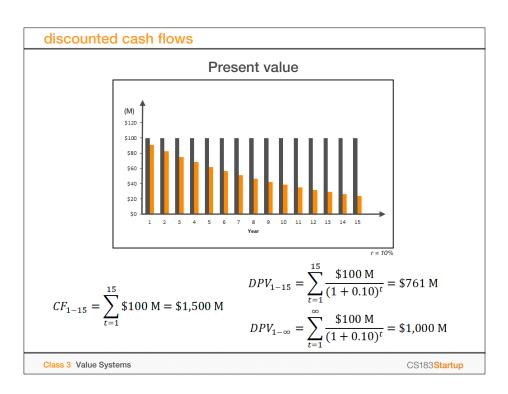
$$DPV = \sum_{t=0}^{N} \frac{CF_t}{(1+r)^t}$$

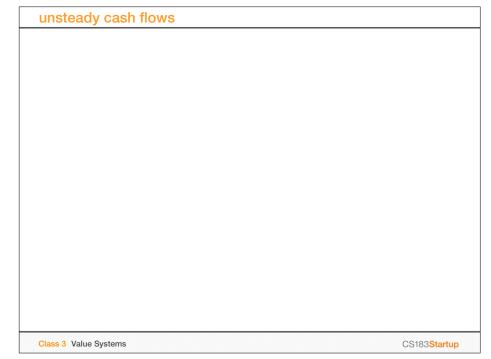
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Present value $DPV_{1-15} = \sum_{t=1}^{15} \frac{\$100 \text{ M}}{(1+0.10)^t} = \761 M $DPV_{1-\infty} = \sum_{t=1}^{\infty} \frac{\$100 \text{ M}}{(1+0.10)^t} = \$1,000 \text{ M}$





unsteady cash flows

g = growth rate

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unsteady cash flows

g = growth rate

$$DPV = \sum_{t=0}^{N} \frac{CF_0(1+g)^t}{(1+r)^t}$$

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unsteady cash flows

 $g = growth \ rate$

$$DPV = \sum_{t=0}^{N} \frac{CF_0(1+g)^t}{(1+r)^t}$$

 $TV = terminal\ value$

unsteady cash flows

 $g = growth \ rate$

$$DPV = \sum_{t=0}^{N} \frac{CF_0(1+g)^t}{(1+r)^t}$$

 $TV = terminal\ value$

$$TV_t = \frac{CF_{t+1}}{(r-g)}$$

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unsteady cash flows

 $g = growth \ rate$

$$DPV = \sum_{t=0}^{N} \frac{CF_0(1+g)^t}{(1+r)^t}$$

 $TV = terminal\ value$

$$TV_t = \frac{CF_{t+1}}{(r-g)}$$

$$TV = \frac{CF_{t+1}}{(r-g)(1+r)^t}$$

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unsteady cash flows

 $g = growth \ rate$

$$DPV = \sum_{t=0}^{N} \frac{CF_0(1+g)^t}{(1+r)^t}$$

 $TV = terminal\ value$

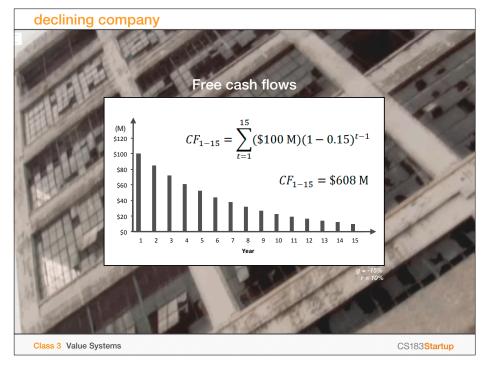
$$TV_t = \frac{CF_{t+1}}{(r-g)}$$

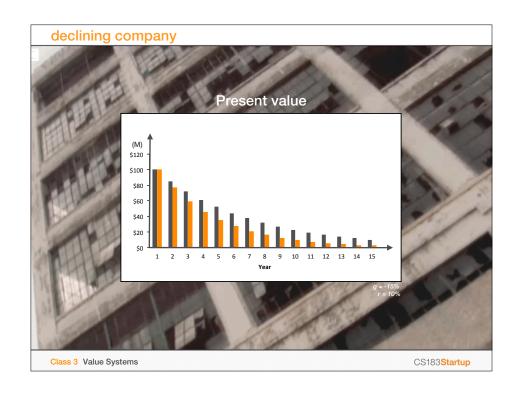
$$TV = \frac{CF_{t+1}}{(r-g)(1+r)^t}$$

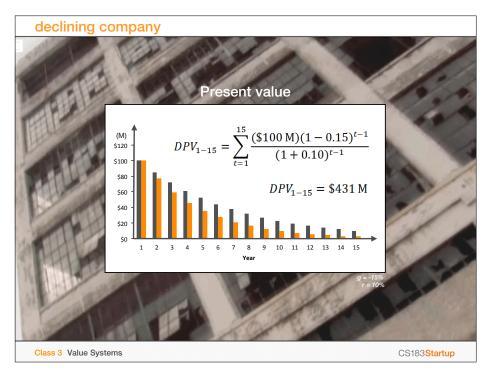
$$NPV = DPV + TV$$

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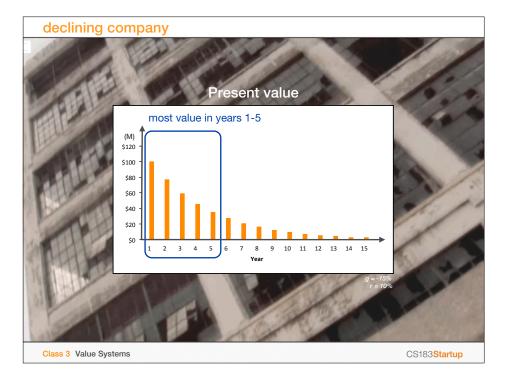


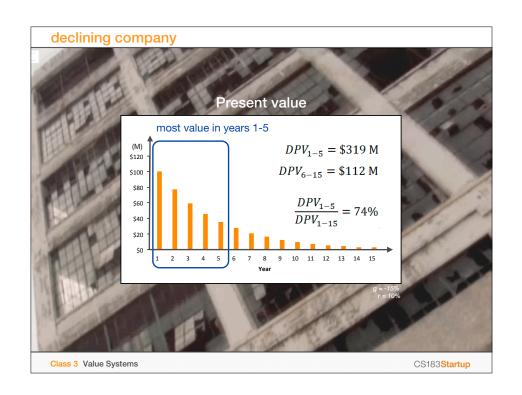


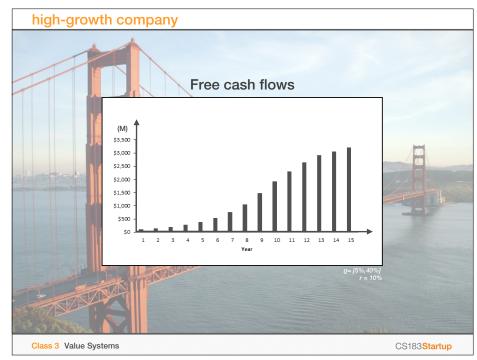


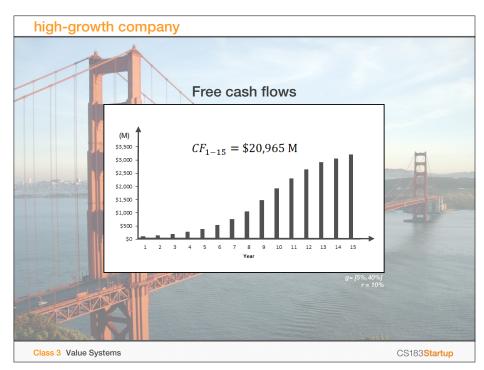


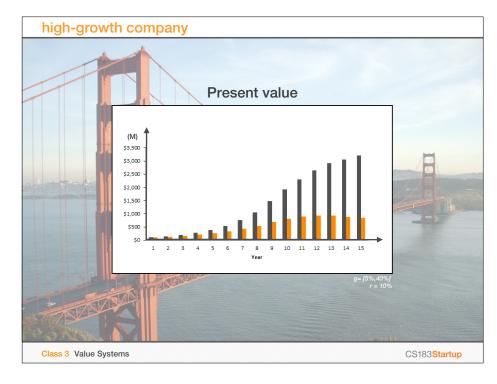


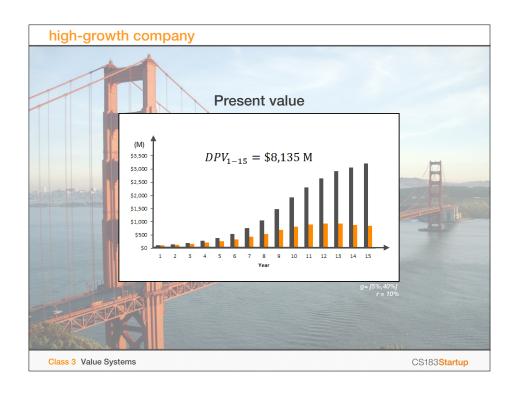


















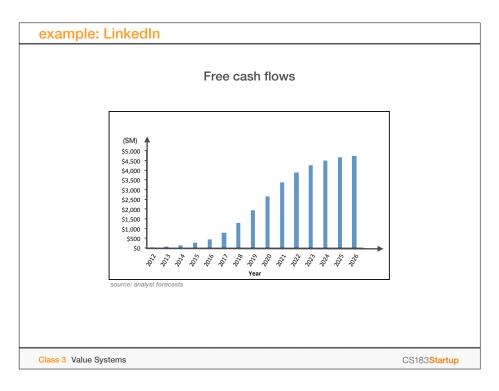
example: LinkedIn Income statement Year Ended December 31, 2010 2009 2008 2007 (in thousands, except per share data) 2011 Consolidated Statements of Operations Data: Net revenue \$522,189 \$243,099 \$120,127 \$78,773 \$32,486 Cost of revenue (exclusive of depreciation and amortization shown separately below) Sales and marketing 164,703 132,222 58,978 65,104 26,847 39,444 16,986 29,366 5,037 11,578 Product development General and administrative 35,064 19,480 12,976 Depreciation and amortization 43,100 19,551 11,854 2,107 Total costs and expenses 496,344 223,523 123,482 84,282 32,918 19,576 (610) 18,966 (432) 773 341 Income (loss) from operations (3,355) 230 (5,509) 1,277 25,845 Other income (expense), net (2,903) Income (loss) before income taxes (3,125) (4,232) 290 22,942 Provision for income taxes 11,030 \$\frac{290}{\subseteq} \frac{13}{\subseteq} \frac{\subseteq}{\subseteq} \frace{\subseteq} \frac{\subseteq}{\subseteq} \frac{\subseteq}{\subset \$ 15,385 \$ (3,973) \$ 11,912 \$ 3,429 Net income (loss) attributable to common stockholders \$ 11,912 S (3,973) Net income (loss) per share attributable to common stockholders: S 0.08 S (0.10) S (0.11) S 0.00 S 0.07 S (0.10) S (0.11) S 0.00 \$ 0.15 \$ 0.11 Diluted Weighted-average shares used to compute net income (loss) per share attributable to common stockholders: Basic 77,185 42,446 46,459 41,184 41,184 42,389 42,389 38,092 104,118 Diluted 38,961 Other Financial and Operational Data: Adjusted EBITDA (1) Number of registered members (at period end) \$ 98,713 \$ 47,959 \$ 14,651 \$ 5,461 \$ 3,480 144,974 90,437 55,111 32,307 16,712 CS183Startup Class 3 Value Systems

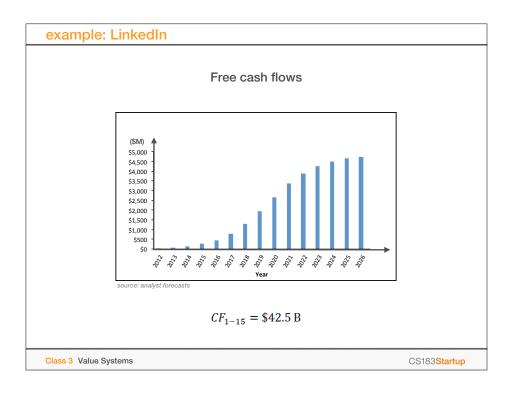
2010 2009 (in thousands, except per	7 \$78,773 \$32 7 \$18,589 \$7 7 \$16,986 \$9 4 \$29,366 \$11 0 \$12,976 \$6 4 \$6,365 \$2	2,486 7,384 5,037 5,78 6,812 2,107
\$243,099 \$120,12 44,826 25,83 58,978 26,84 65,104 39,44 35,064 19,484 19,551 11,85 123,523 123,48 19,576 (3,33	7 \$78,773 \$32 7 \$18,589 \$7 7 \$16,986 \$5 4 \$29,366 \$11 9 \$12,976 \$6 4 \$6,365 \$2	7,384 5,037 ,578 5,812
44,826 25,85 58,978 26,84 65,104 39,44 35,064 19,48 19,551 11,85 223,523 123,48 19,576 (3,35	7 18,589 1 7 16,986 2 4 29,366 11 0 12,976 6 4 6,365 2	7,384 5,037 ,578 5,812
44,826 25,85 58,978 26,84 65,104 39,44 35,064 19,48 19,551 11,85 223,523 123,48 19,576 (3,35	7 18,589 1 7 16,986 2 4 29,366 11 0 12,976 6 4 6,365 2	7,384 5,037 ,578 5,812
58,978 26,84 65,104 39,44 35,064 19,48 19,551 11,85 223,523 123,48 19,576 (3,35	7 16,986 5 4 29,366 11 0 12,976 6 4 6,365 2	,578 ,578 ,812 ,107
58,978 26,84 65,104 39,44 35,064 19,48 19,551 11,85 223,523 123,48 19,576 (3,35	7 16,986 5 4 29,366 11 0 12,976 6 4 6,365 2	,578 ,578 ,812 ,107
65,104 39,44 35,064 19,48 19,551 11,85 223,523 123,48 19,576 (3,35	4 29,366 11 0 12,976 6 4 6,365 2	,578 5,812 2,107
35,064 19,48 19,551 11,85 223,523 123,48 19,576 (3,35	0 12,976 6 4 6,365	,812 ,107
19,551 11,85 223,523 123,48 19,576 (3,35	4 6,365 2	,107
223,523 123,48 19,576 (3,35		
19,576 (3,35	2 04,202 32	
	5) (5,509)	(432)
(610) 23		773
18,966 (3,12		341
3,581 84		13
		328
		_
3 3,429 3 (3,97	3 (4,322) 3	
S 0.08 S (0.1	0) \$ (0.11) \$	0.00
3 0.07 3 (0.1) <u>3 (0.11)</u> <u>3</u>	0.00
42,446 41,18	4 42,389 38	,092
		,961
.,	,	
S 47,959 S 14,65	1 S 5,461 S 3	,480
		,712
46,459 \$ 47,959	\$ (3,97) \$ (0.10) \$ (0.10) \$ 41,180 \$ 14,65	\$ (0.10) \$ (0.11) \$ (

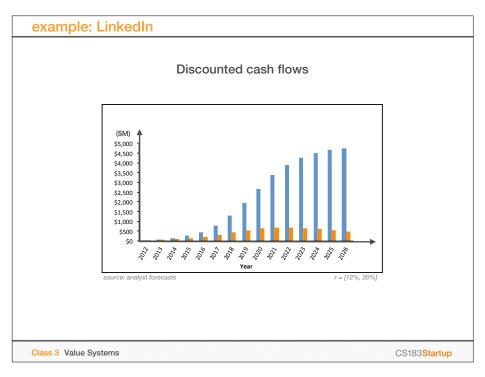
2011 \$522,189	2010	Ended December 3 2009 ads, except per sha	2008	2007
			2008	2007
\$522 189	(in thousar.			2007
\$522 189		us, except per sna	re data)	
	\$243,099	\$120,127	\$78,773	\$32,486
81,448	44,826	25,857	18,589	7,384
164,703		26,847	16,986	5,037
				11,578
				6,812
				2,107
				32,918
				(432)
				773
				341
,,,,,,				13
				\$ 328
\$ 11,912	\$ 3,429	S (3,973)	S (4,522)	<u>s — </u>
\$ 0.15	S 0.08	S (0.10)	S (0.11)	\$ 0.00
S 0.11	S 0.07	S (0.10)	S (0.11)	S 0.00
77,185	42,446	41,184	42,389	38,092
104,118	46,459	41,184	42,389	38,961
\$ 98,713	\$ 47,959	\$ 14,651	\$ 5,461	\$ 3,480
144,974	90,437	55,111	32,307	16,712
	164,703 132,227 74,871 43,100 496,344 25,845 (2,903) 22,942 11,030 \$ 11,912 \$ 11,912 \$ 0.15 \$ 0.11	164,703 58,978 132,222 65,104 43,100 19,551 496,344 223,523 22,845 19,576 6110 22,942 18,966 11,030 3,581 511,912 515,385 511,912 53,429 50,11 50,07 77,185 42,446 104,118 46,459 5 9,8713 5 47,959	164,703 \$8,978 26,847 132,222 65,104 39,444 74,871 35,064 19,480 43,100 19,551 11,854 496,344 223,523 123,482 25,845 19,576 (3,355) (2,903) (610) 230 22,942 18,966 (3,125) (11,030) 3,581 848 511,912 \$15,385 (3,973) \$11,912 \$3,429 \$(3,973) \$11,912 \$3,429 \$(3,973) \$0.15 \$0.08 \$0.100 \$7,185 42,446 41,184 104,118 46,459 41,184 \$9,8713 \$47,959 \$14,651 \$9,8713 \$47,959 \$14,651 \$1,900 \$14,651 \$1,900 \$14,651 \$1,900 \$14,651 \$1,900 \$1,900 \$14,651 \$1,900 \$14,651 \$1,900 \$1,900 \$1,900 \$14,651 \$1,900 \$1,900 \$1,900 \$14,651 \$1,900 \$1,900 \$1,900 \$14,651 \$1,900 \$1,900 \$14,651 \$1,900 \$1,900 \$1,900 \$14,651 \$1,900 \$1,900 \$1,900 \$14,651 \$1,900 \$1,900 \$1,900 \$14,651 \$1,900 \$1,900 \$14,651 \$1,900	164,703 58,978 26,887 16,986 132,222 65,104 39,444 29,366 74,871 35,064 19,480 12,976 43,100 19,551 11,854 6,365 496,344 229,523 22,845 19,576 (3,355) (5,599) (2,903) (610) 230 12,77 (2,2942 18,966 (3,125) (4,232) 11,030 3,581 848 290 (1,1912 5,15,385 5,3973) 5,4522 (3,125) (4,232) (3,125) (4,232) (3,125) (4,232) (3,125) (4,232) (3,125) (4,232) (3,125) (4,232) (3,125) (4,232) (3,125) (4,232) (3,125) (4,232) (3,125) (4,232) (3,125) (4,232) (3,125) (4,232) (3,125) (4,232) (3,125) (4,232) (3,125) (4,232) (4,125) (4,232) (4,125) (

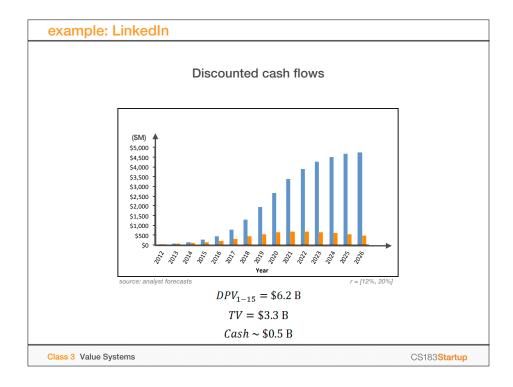
Income st	ateme	ent			
			Ended December 3		
	2011	2010	2009 ds, except per sha	2008 ero data)	2007
Consolidated Statements of Operations Data:		(in thousan	us, except per sur	are duting	
Net revenue	\$522,189	\$243,099	\$120,127	\$78,773	\$32,486
Costs and expenses:					
Cost of revenue (exclusive of depreciation and amortization					
shown separately below)	81,448	44,826	25,857	18,589	7,384
Sales and marketing	164,703	58,978	26,847	16,986	5,037
Product development	132,222	65,104	39,444	29,366	11,578
General and administrative	74,871	35,064	19,480	12,976	6,812
Depreciation and amortization	43,100	19,551	11,854	6,365	2,107
Total costs and expenses	496,344	223,523	123,482	84,282	32,918
Income (loss) from operations	25,845	19,576	(3,355)	(5,509)	(432)
Other income (expense), net	(2,903)	(610)	230	1,277	773
Income (loss) before income taxes	22,942	18,966	(3,125)	(4,232)	341
Provision for income taxes	11,030	3,581	848	290	13
Net income (loss)	S 11,912	\$ 15,385	S (3,973)	S (4,522)	S 328
. ,	S 11,912	\$ 3,429	S (3,973)	\$ (4,522)	s —
Net income (loss) per share attributable to common stockholders:	5 11,712	5 5,425	(2,773)	0 (1,022)	
Basic Basic	S 0.15	S 0.08	S (0.10)	S (0.11)	S 0.00
Diluted	S 0.11	S 0.07	S (0.10)	\$ (0.11)	\$ 0.00
Weighted-average shares used to compute net income (loss) per share attributable to common stockholders:					
Basic	77,185	42,446	41,184	42,389	38,092
Diluted	104,118	46,459	41,184	42,389	38,961
Other Financial and Operational Data:					
Adjusted EBITDA (1)	\$ 98,713	\$ 47,959	\$ 14,651	\$ 5,461	\$ 3,480
Number of registered members (at period end)	144,974	90,437	55,111	32,307	16,712
					, –

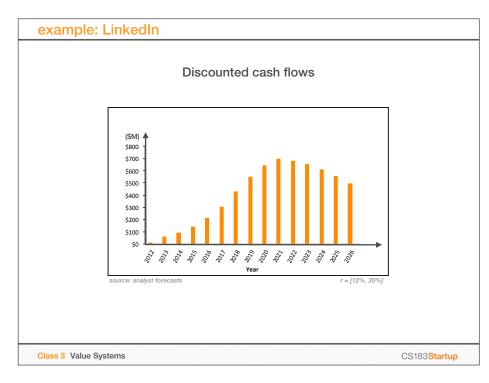
			Year	Ended December 3	31,	
		2011	2010	2009	2008	2007
	Consolidated Statements of Operations Data:		(in thousar	ds, except per sha	ire data)	
	Net revenue	\$522,189	\$243,099	\$120,127	\$78,773	\$32,486
	Costs and expenses:	3322,109	3243,099	3120,127	376,773	332,400
	Cost of revenue (exclusive of depreciation and amortization					
	shown separately below)	81,448	44,826	25,857	18,589	7,384
	Sales and marketing	164,703	58,978	26,847	16,986	5,037
	Product development	132,222	65,104	39,444	29,366	11,578
	General and administrative	74,871	35,064	19,480	12,976	6,812
	Depreciation and amortization	43,100	19,551	11,854	6,365	2,107
	Total costs and expenses	496,344	223,523	123,482	84,282	32,918
	Income (loss) from operations	25,845	19,576	(3,355)	(5,509)	(432)
	Other income (expense), net	(2,903)	(610)	230	1,277	773
	Income (loss) before income taxes	22,942	18,966	(3,125)	(4,232)	341
	Provision for income taxes	11,030	3,581	(3,125)	(4,232)	13
-						
	Net income (loss)	\$ 11,912	\$ 15,385	S (3,973)	\$ (4,522)	S 328
	Net income (loss) attributable to common stockholders	\$ 11,912	\$ 3,429	S (3,973)	\$ (4,522)	<u>s</u> —
	Net income (loss) per share attributable to common stockholders:					
	Basic	S 0.15	\$ 0.08	S (0.10)	\$ (0.11)	\$ 0.00
	Diluted	S 0.11	S 0.07	S (0.10)	\$ (0.11)	S 0.00
	Weighted-average shares used to compute net income (loss) per share attributable to common stockholders:					
	Rasic	77,185	42,446	41 104	42,389	20.002
				41,184		38,092
	Diluted	104,118	46,459	41,184	42,389	38,961
	Other Financial and Operational Data:					
	Adjusted EBITDA (1)	\$ 98,713	\$ 47,959	\$ 14,651	\$ 5,461	\$ 3,480
	Number of registered members (at period end)	144,974	90.437	55.111	32,307	16,712

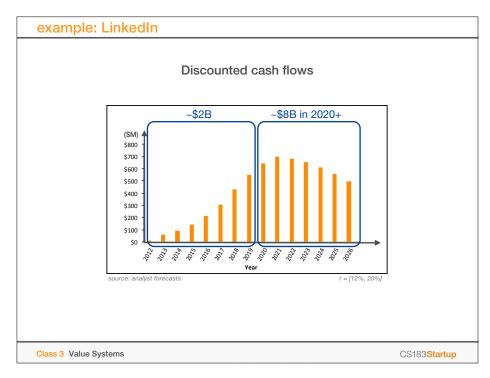


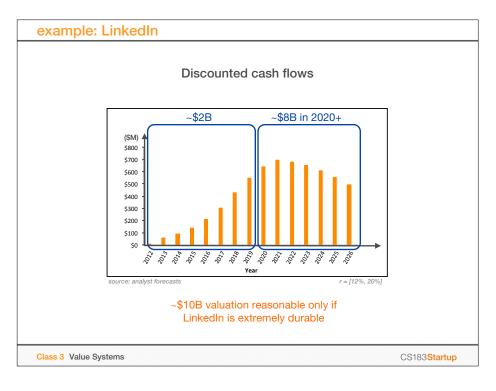












outline

- 1. great technology companies
- 2. valuation
- 3. durability
- 4. capturing value
- 5. the ideology of competition

Class 3 Value Systems

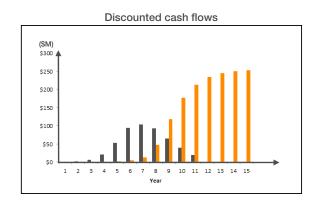
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first mover advantage?



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last mover advantage



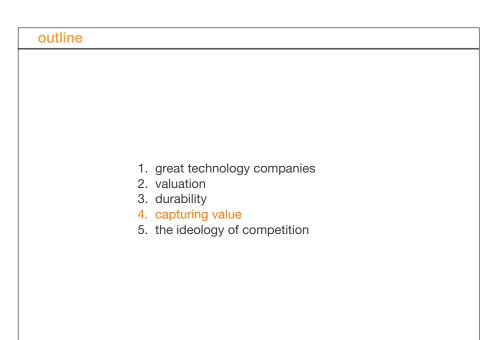
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last mover



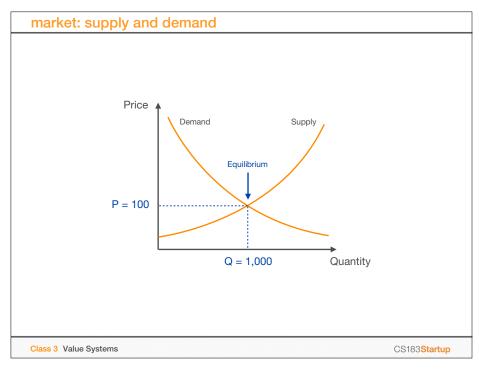
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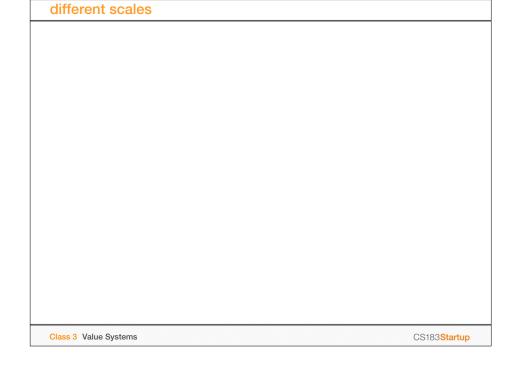


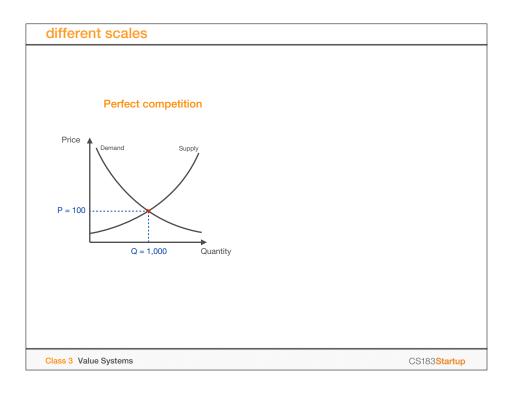


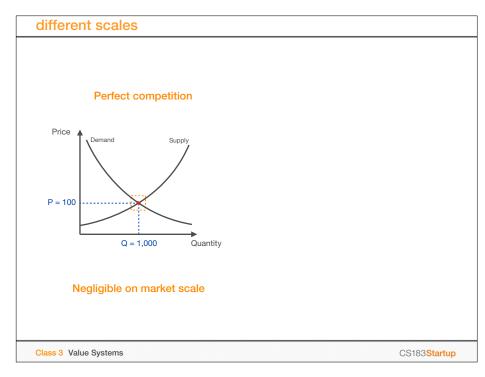
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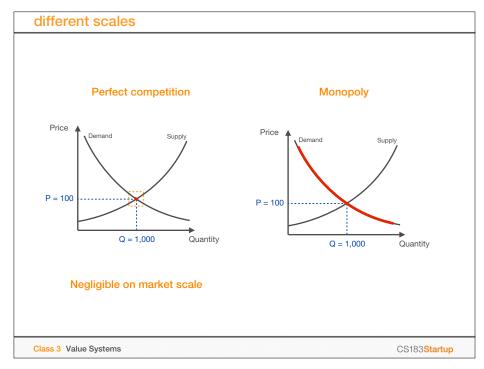
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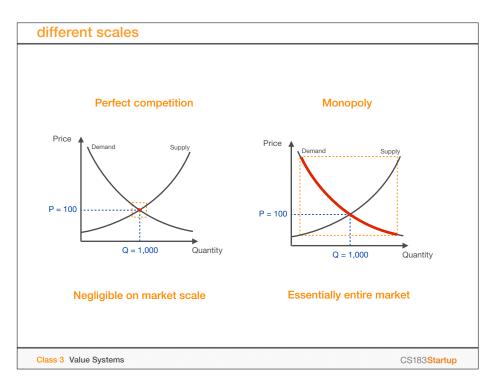


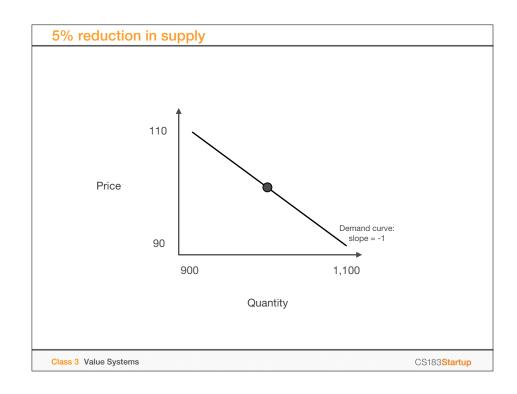


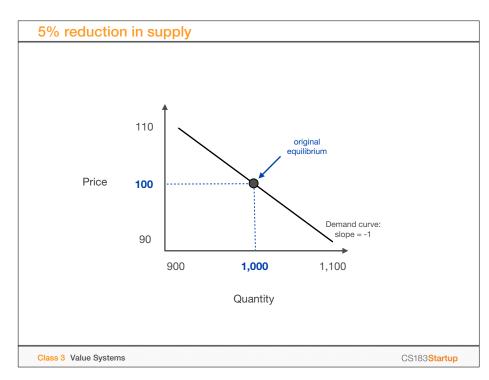


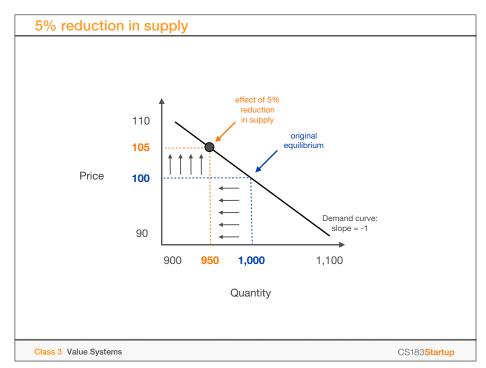


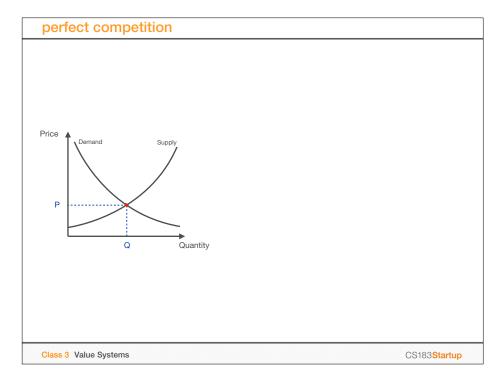


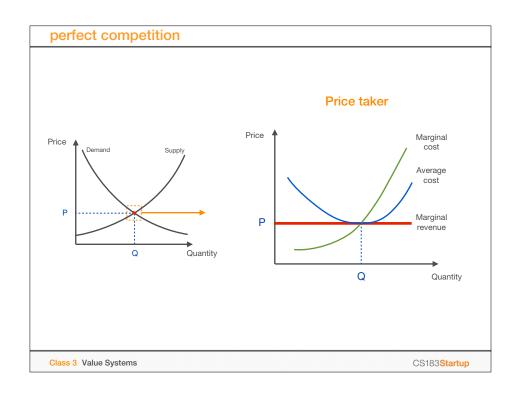


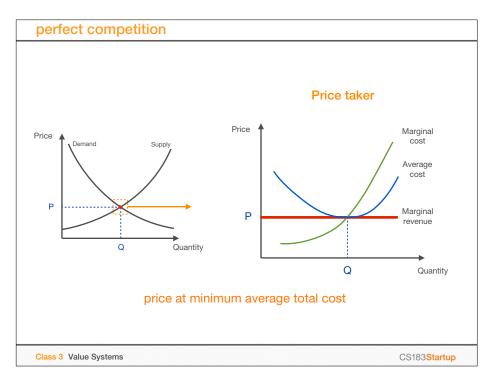


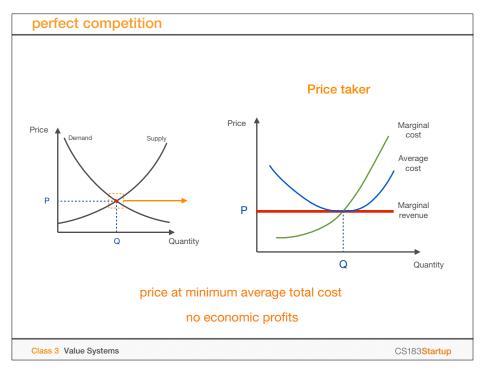


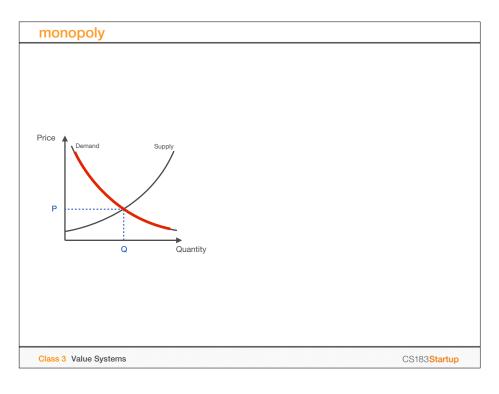


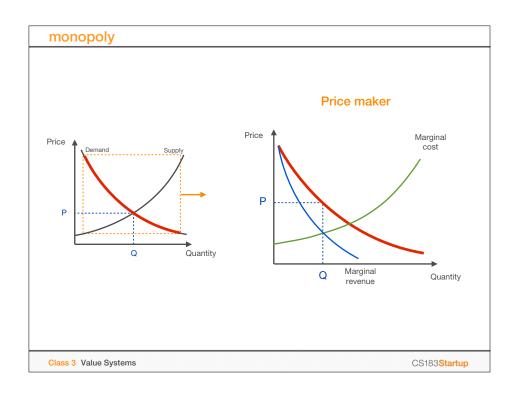


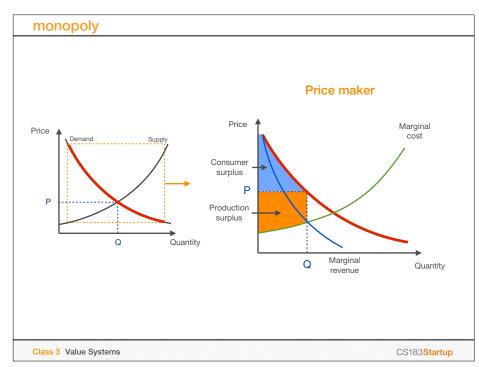


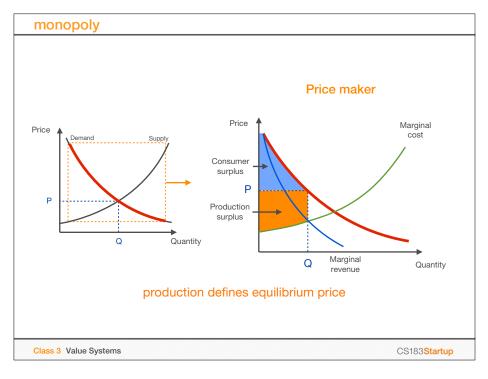


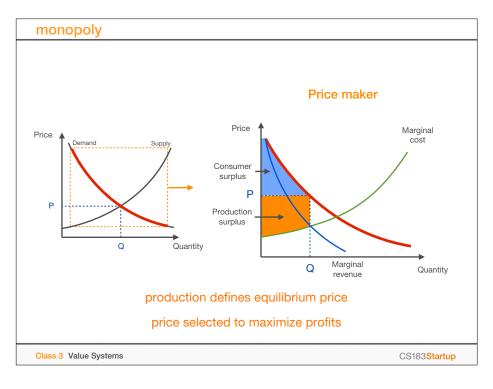












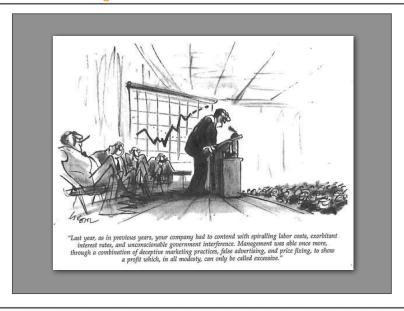
outline

- 1. great technology companies
- 2. valuation
- 3. durability
- 4. capturing value
- 5. the ideology of competition

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worth considering



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perception

"People of the same trade seldom meet together, even for merriment and diversion, but the conversation ends in a conspiracy against the public, or in some contrivance to raise prices."

- Adam Smith, The Wealth of Nations

regulation

"The possession of monopoly power will not be found unlawful unless it is accompanied by an element of anticompetitive conduct"

- The Sherman Act

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DOJ tests

Lerner index

$$L = \frac{P - MC}{P}$$

Herfindahl-Hirschman Index

$$HHI = \sum_{i=0}^{N} s_i^2$$

m-firm concentration ratio

$$CR_m = \sum_{i=1}^m s_i$$

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monopoly

Class 3 Value Systems

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monopoly

cons

monopoly

cons

lower output, higher prices

Class 3 Value Systems

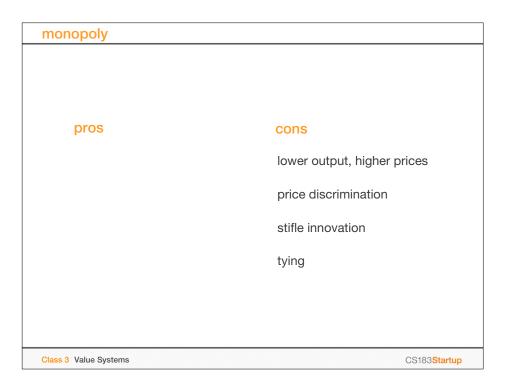
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monopoly	
	cons
	lower output, higher prices
	price discrimination
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monopoly	
	cons
	lower output, higher prices
	price discrimination
	stifle innovation
Class 3 Value Systems	CS183 <mark>Startup</mark>

monopoly	
	cons
	lower output, higher prices
	price discrimination
	stifle innovation
	tying
Class 3 Value Systems	CS183 <mark>Startup</mark>



monopoly	
pros	cons
incentive to innovate	lower output, higher prices
	price discrimination
	stifle innovation
	tying
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monopoly	
pros	cons
incentive to innovate	lower output, higher prices
stable, long-term planning	price discrimination
	stifle innovation
	tying
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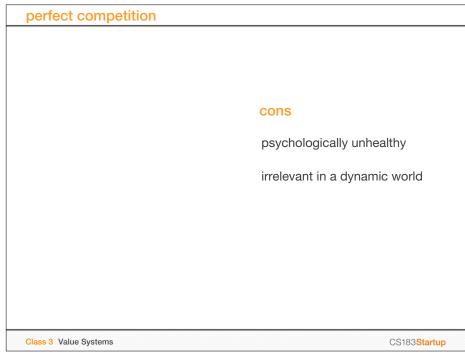
monopoly	
pros	cons
incentive to innovate	lower output, higher prices
stable, long-term planning	price discrimination
deeper project financing	stifle innovation
	tying
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pros	cons
incentive to innovate	lower output, higher prices
stable, long-term planning	price discrimination
deeper project financing	stifle innovation
symptomatic of creation	tying
3 Value Systems	CS183 <mark>Start</mark>

monopoly

perfect competition	perfect competition
	cons
Class 3 Value Systems CS183Startup	Class 3 Value Systems CS183Startup
perfect competition	perfect competition

perfect competition	
	cons
	psychologically unhealthy
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perfect competition	
	cons
	psychologically unhealthy
	irrelevant in a dynamic world
	preempts question of value
Class 3 Value Systems	CS183 Startup

perfect competition	
pros	cons
	psychologically unhealthy
	irrelevant in a dynamic world
	preempts question of value
Class 3 Value Systems	CS183 <mark>Startup</mark>

perfect competition	
pros	cons
easy to model	psychologically unhealthy
	irrelevant in a dynamic world
	preempts question of value
Class 3 Value Systems	CS183 <mark>Startup</mark>

perfect competition	
pros	cons
easy to model	psychologically unhealthy
efficient in a static world	irrelevant in a dynamic world
	preempts question of value
Class 3 Value Systems	CS183 Startup

perfect competition	
pros	cons
easy to model	psychologically unhealthy
efficient in a static world	irrelevant in a dynamic world
politically salable	preempts question of value
Class 3 Value Systems	CS183 <mark>Startup</mark>

