IV. Operating Income Growth when Return on Capital is Changing

- When the return on capital is changing, there will be a second component to growth, positive if the return on capital is increasing and negative if the return on capital is decreasing.
- If ROC_t is the return on capital in period t and ROC_{t+1} is the return on capital in period t+1, the expected growth rate in operating income will be:

$$\text{Expected Growth Rate} = ROC_{t+1} * \text{Reinvestment rate} + (ROC_{t+1} - ROC_t) / ROC_t$$

- **In general, if return on capital and margins are changing and/or expected to change at a company, you are better off not using any of the sustainable growth equations to estimate growth.**

The Value of Growth

	Firm 1	Firm 2	Firm 3	Firm 4	Firm 5
Reinvestment Rate	20.00%	100.00%	200.00%	20.00%	0.00%
ROIC on new investment	50.00%	10.00%	5.00%	10.00%	10.00%
ROIC on existing investments before	10.00%	10.00%	10.00%	10.00%	10.00%
ROIC on existing investments after	10.00%	10.00%	10.00%	10.80%	11.00%
Expected growth rate	**10.00%**	**10.00%**	**10.00%**	**10.00%**	**10.00%**

Expected growth = Growth from new investments + Efficiency growth

= Reinv Rate * ROC + $(ROC_t - ROC_{t-1})/ROC_{t-1}$

Assume that your cost of capital is 10%. As an investor, rank these firms in the order of most value growth to least value growth.

Growth IV

Top Down Growth

Estimating Growth when Operating Income is Negative or Margins are changing

- All of the fundamental growth equations assume that the firm has a return on equity or return on capital it can sustain in the long term.
- When operating income is negative or margins are expected to change over time, we use a three-step process to estimate growth:
  - Estimate growth rates in revenues over time
    - Determine the total market (given your business model) and estimate the market share that you think your company will earn.
    - Decrease the growth rate as the firm becomes larger
    - Keep track of absolute revenues to make sure that the growth is feasible
  - Estimate expected operating margins each year
    - Set a target margin that the firm will move towards
    - Adjust the current margin towards the target margin
  - Estimate the capital that needs to be invested to generate revenue growth and expected margins
    - Estimate a sales to capital ratio that you will use to generate reinvestment needs each year.

1. Revenue Growth

Revenue Growth and Magnitude

Market Size and Growth

1. Current Market size: The size of the market for the company's products & services, given geography it is targeting and product type.
2. Expected Growth in Market: Gowth in total market, as technology and market conditions change.

X

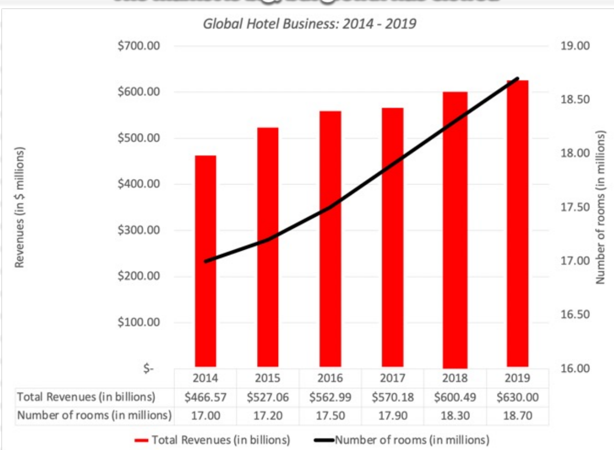
Market Share

1. Company's current market share: If company's current market share is low, potential for growth in market share at expense of competition.
2. Industry economics: Nature of the business (a few big winners or splintered competition).
3. Strength of company's competitive advantages: Stronger and more sustainable competitive advantages should allow for higher market share.

The potential for revenue growth is greater for companies with small revenues (and market share) in a big and growing market, especially if the company has strong competitive advantages in winner-take-all businesses.

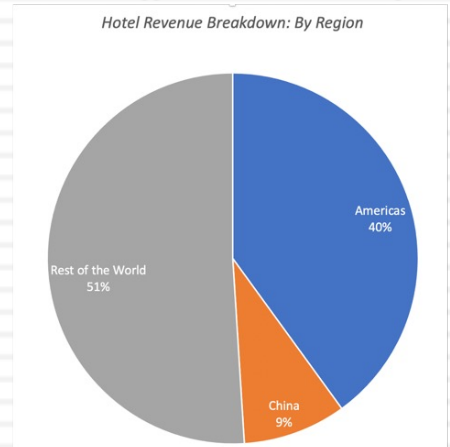
Airbnb: Total Market

The market is big, but growth has slowed



It is concentrated, and getting more so…

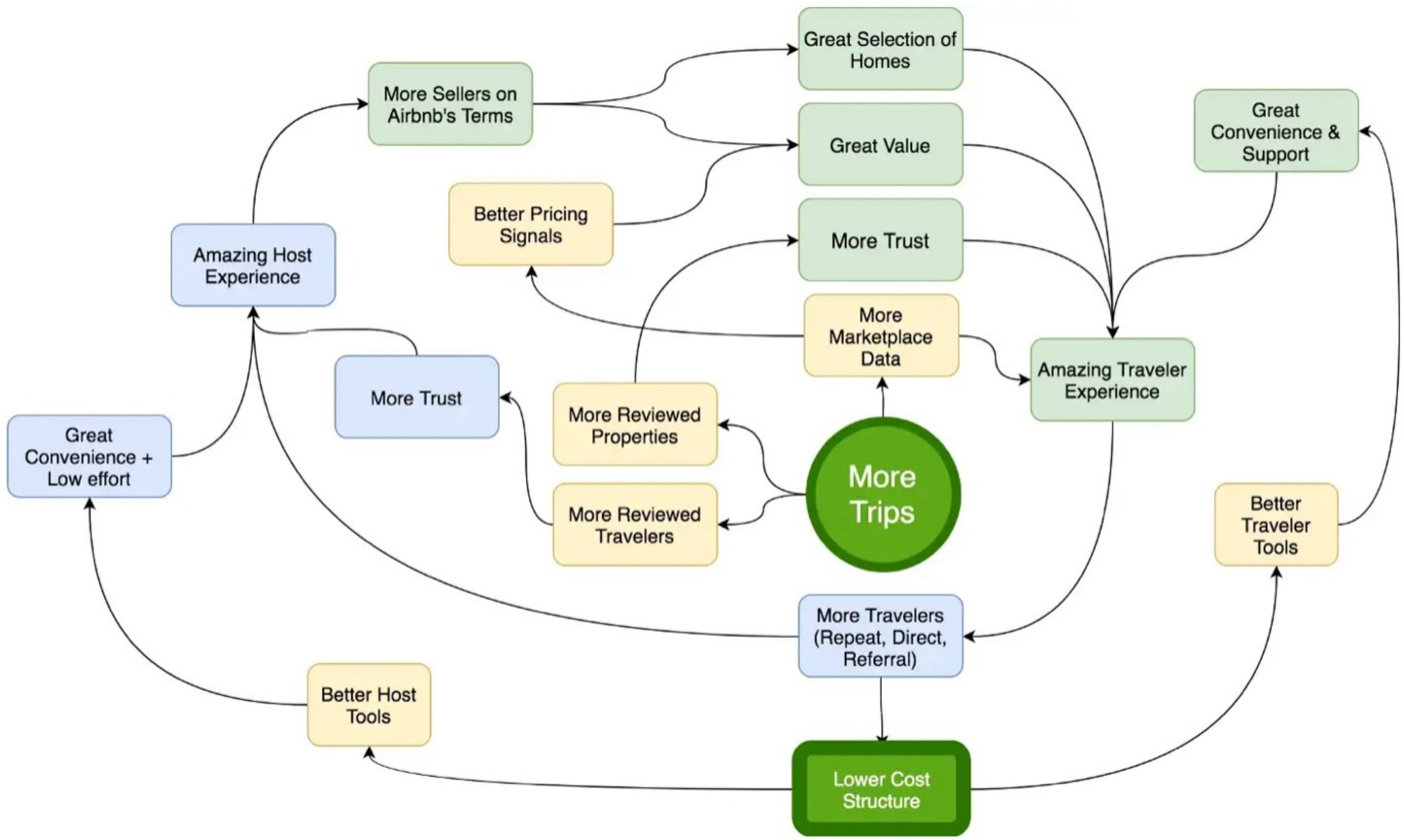
The US is the biggest market, but China is growing.



In its prospectus, Airbnb has expanded its estimate of market potential to $3.4 trillion, as evidenced in this excerpt from the prospectus:

> *We have a substantial market opportunity in the growing travel market and experience economy. We estimate our serviceable addressable market ("SAM") today to be $1.5 trillion, including $1.2 trillion for short-term stays and $239 billion for experiences. We estimate our total addressable market ("TAM") to be $3.4 trillion, including $1.8 trillion for short-term stays, $210 billion for long-term stays, and $1.4 trillion for experiences.*

Airbnb: Market Share



2. Target Margins (and path there)…

Operating Margin: Target and Pathway

Target Operating Margin →

1. *Unit Economics*: Profits on extra unit sold (Gross Margins), as percent of price, with higher profitability going with higher operating margin.
2. *Economies of scale*: Costs growth relative to revenue growth, with greater economies of scale allowing for higher margins.
3. *Competition*: Pricing behavior among competitiors, with more aggressive pricing leading to lower margins.

Pathway to Profitability

1. *Company's current operating margin:* The lower a company's current margin, relative to the target, the steeper the path to profitability.
2. *Profitability versus Growth trade off:* Companies that put growth ahead of profitability will wait longer before getting to target margin.
3. *Business model:* The more well formed a business model, the speedier the pathway to the target margin.

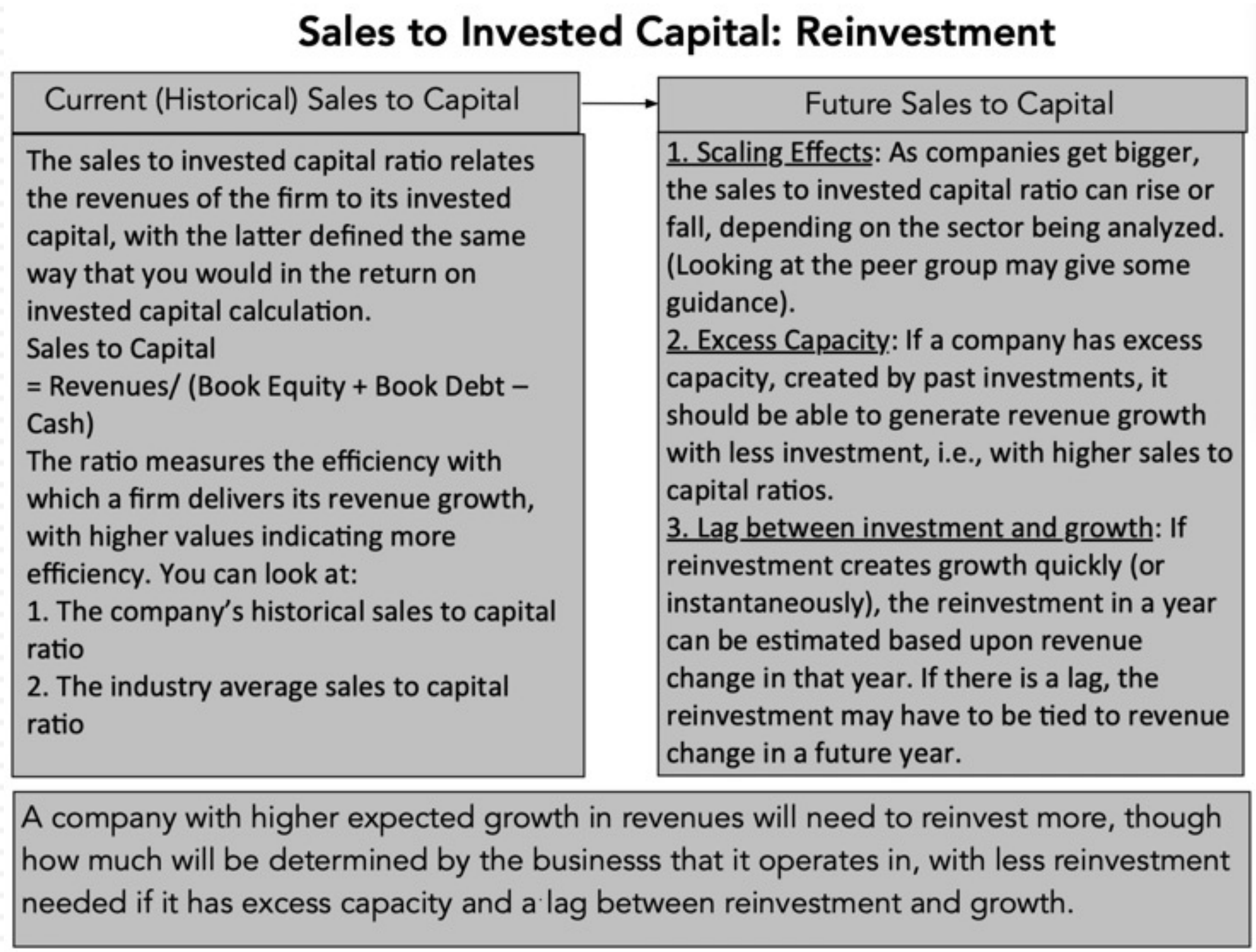
While all companies would like higher margins in steady state, the level of these margins will be determined by the sector in which a firm operates and its choice of business model, and the speed with which you move towards those target margins will be determined by a company's ambitions and business model choices.

Airbnb in November 2020: Growth and Profitability

	Gross Bookings	*Revenues*	*Revenue Growth*	*Operating Margin*
LTM	*$ 26,491,803.00*	*$ 3,625,731*		
1	$ 37,088,524.20	$ 4,691,698	40.00%	-10.00%
2	$ 46,360,655.25	$ 5,989,797	25.00%	-3.00%
3	$ 57,950,819.06	$ 7,565,479	25.00%	0.50%
4	$ 72,438,523.83	$ 9,554,641	25.00%	4.00%
5	$ 90,548,154.79	$ 12,065,542	25.00%	7.50%
6	$ 109,019,978.36	$ 14,674,089	20.40%	9.52%
7	$ 126,245,134.94	$ 17,163,026	15.80%	13.39%
8	$ 140,384,590.06	$ 19,274,804	11.20%	17.26%
9	$ 149,649,973.00	$ 20,748,969	6.60%	21.13%
10	$ 152,642,972.46	$ 21,370,016	2.00%	25.00%
Terminal year	$ 155,695,831.91	$ 21,797,416	2.00%	25.00%

	Expedia			Booking.com		
	2019	LTM	% Change (Annualized)	2019	LTM	% Change (Annualized)
Gross Bookings	$107,870.00	$52,470.00	-61.75%	$ 96,400.00	$ 48,752.00	-59.71%
Revenues	$ 12,067.00	$ 7,026.00	-51.38%	$ 15,066.00	$ 8,897.00	-50.46%
Operating Income	$ 961.00	$ (892.00)	NA	$ 5,345.00	$ 1,831.00	-76.03%
Revenues/Gross Bookings	11.19%	13.39%		15.63%	18.25%	
Operating Margin	7.96%	-12.70%		35.48%	20.58%	

3. Sales to Invested Capital: A Pathway to estimating Reinvestment



Airbnb: Reinvestment and Profitability

Taxes
Note that losses are carried forward and the company starts paying taxes only in year 5. Target tax rate is 25%.

Reinvestment
Reinvestment = Net Cap Ex + Acquisitions + Capitalized R&D + Chg in Working Capital)
To estimate the reinvestment, I divide the change in sales in that year by the sales to invested capital ratio.

Year	*Revenues*	*Operating Margin*	*EBIT*	*EBIT (1-t)*	*Change in Sales*	*Sales to Capital*	*Reinvestment*	*FCFF*	*Invested Capital*	*ROIC*
	$ 3,625,731	*-13.69%*	*$ (496,542)*	*$ (496,542)*		*1.92*			$ 1,370,158	-36.24%
1	$ 4,691,698	-10.00%	$ (469,170)	$ (469,170)	$ 1,065,967	2.00	$ 532,984	$ (1,002,153)	$ 1,903,142	-24.65%
2	$ 5,989,797	-3.00%	$ (179,694)	$ (179,694)	$ 1,298,098	2.00	$ 649,049	$ (828,743)	$ 2,552,191	-7.04%
3	$ 7,565,479	0.50%	$ 37,827	$ 37,827	$ 1,575,683	2.00	$ 787,841	$ (750,014)	$ 3,340,033	1.13%
4	$ 9,554,641	4.00%	$ 382,186	$ 382,186	$ 1,989,162	2.00	$ 994,581	$ (612,395)	$ 4,334,613	8.82%
5	$ 12,065,542	7.50%	$ 904,916	$ 777,799	$ 2,510,900	2.00	$ 1,255,450	$ (477,651)	$ 5,590,064	13.91%
6	$ 14,674,089	9.52%	$1,397,269	$ 1,047,952	$ 2,608,547	2.00	$ 1,304,274	$ (256,322)	$ 6,894,337	15.20%
7	$ 17,163,026	13.39%	$2,298,389	$ 1,723,792	$ 2,488,937	2.00	$ 1,244,469	$ 479,323	$ 8,138,806	21.18%
8	$ 19,274,804	17.26%	$3,327,026	$ 2,495,269	$ 2,111,778	2.00	$ 1,055,889	$ 1,439,380	$ 9,194,695	27.14%
9	$ 20,748,969	21.13%	$4,384,362	$ 3,288,271	$ 1,474,165	2.00	$ 737,082	$ 2,551,189	$ 9,931,777	33.11%
10	$ 21,370,016	25.00%	$5,342,504	$ 4,006,878	$ 621,047	2.00	$ 310,524	$ 3,696,354	$10,242,301	39.12%

Invested Capital
Invested Capital in year t = Invested Capital in year t-1 + Reinvestment

Investment Returns
ROIC = EBIT (1-t)/ Invested Capital in year t