

The Five Deadly Sins of an Analyst

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- Tunnel Vision: Becoming so focused on the sector and valuations within the sector that you lose sight of the bigger picture.
- Lemmingitis: Strong urge felt to change recommendations & revise earnings estimates when other analysts do the same.
- Stockholm Syndrome: Refers to analysts who start identifying with the managers of the firms that they are supposed to follow.
- Factophobia (generally is coupled with delusions of being a famous story teller): Tendency to base a recommendation on a “story” coupled with a refusal to face the facts.
- Dr. Jekyll/Mr.Hyde: Analyst who thinks his primary job is to bring in investment banking business to the firm.

Propositions about Analyst Growth Rates

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- Proposition 1: There is far less private information and far more public information in most analyst forecasts than is generally claimed.
- Proposition 2: The biggest source of private information for analysts remains the company itself which might explain
 - why there are more buy recommendations than sell recommendations (information bias and the need to preserve sources)
 - why there is such a high correlation across analysts forecasts and revisions
 - why All-America analysts become better forecasters than other analysts after they are chosen to be part of the team.
- Proposition 3: There is value to knowing what analysts are forecasting as earnings growth for a firm. There is, however, danger when they agree too much (lemmingitis) and when they agree to little (in which case the information that they have is so noisy as to be useless).

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Growth III

Sustainable growth and Fundamentals

Fundamental Growth Rates

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$$\begin{array}{|c|} \hline \text{Investment} \\ \text{in Existing} \\ \text{Projects} \\ \text{\$ 1000} \\ \hline \end{array} \times \begin{array}{|c|} \hline \text{Current Return on} \\ \text{Investment on} \\ \text{Projects} \\ \text{12\%} \\ \hline \end{array} = \begin{array}{|c|} \hline \text{Current} \\ \text{Earnings} \\ \text{\$120} \\ \hline \end{array}$$

$$\begin{array}{|c|} \hline \text{Investment} \\ \text{in Existing} \\ \text{Projects} \\ \text{\$1000} \\ \hline \end{array} \times \begin{array}{|c|} \hline \text{Next Period's} \\ \text{Return on} \\ \text{Investment} \\ \text{12\%} \\ \hline \end{array} + \begin{array}{|c|} \hline \text{Investment} \\ \text{in New} \\ \text{Projects} \\ \text{\$100} \\ \hline \end{array} \times \begin{array}{|c|} \hline \text{Return on} \\ \text{Investment on} \\ \text{New Projects} \\ \text{12\%} \\ \hline \end{array} = \begin{array}{|c|} \hline \text{Next} \\ \text{Period's} \\ \text{Earnings} \\ \text{132} \\ \hline \end{array}$$

$$\begin{array}{|c|} \hline \text{Investment} \\ \text{in Existing} \\ \text{Projects} \\ \text{\$1000} \\ \hline \end{array} \times \begin{array}{|c|} \hline \text{Change in} \\ \text{ROI from} \\ \text{current to next} \\ \text{period: 0\%} \\ \hline \end{array} + \begin{array}{|c|} \hline \text{Investment} \\ \text{in New} \\ \text{Projects} \\ \text{\$100} \\ \hline \end{array} \times \begin{array}{|c|} \hline \text{Return on} \\ \text{Investment on} \\ \text{New Projects} \\ \text{12\%} \\ \hline \end{array} = \begin{array}{|c|} \hline \text{Change in Earnings} \\ \text{= \$ 12} \\ \hline \end{array}$$

Growth Rate Derivations

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In the special case where ROI on existing projects remains unchanged and is equal to the ROI on new projects

$$\frac{\text{Investment in New Projects}}{\text{Current Earnings}} \times \text{Return on Investment} = \frac{\text{Change in Earnings}}{\text{Current Earnings}}$$

$$\frac{100}{120} \times 12\% = \frac{\$12}{\$120}$$

$$\text{Reinvestment Rate} \times \text{Return on Investment} = \text{Growth Rate in Earnings}$$

$$83.33\% \times 12\% = 10\%$$

in the more general case where ROI can change from period to period, this can be expanded as follows:

$$\frac{\text{Investment in Existing Projects} * (\text{Change in ROI}) + \text{New Projects (ROI)}}{\text{Investment in Existing Projects} * \text{Current ROI}} = \frac{\text{Change in Earnings}}{\text{Current Earnings}}$$

For instance, if the ROI increases from 12% to 13%, the expected growth rate can be written as follows:

$$\frac{\$1,000 * (.13 - .12) + 100 (13\%)}{\$1000 * .12} = \frac{\$23}{\$120} = 19.17\%$$

Estimating Fundamental Growth from new investments: Three variations

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Earnings Measure	Reinvestment Measure	Return Measure
Earnings per share	Retention Ratio = % of net income retained by the company = $1 - \text{Payout ratio}$	Return on Equity = $\text{Net Income} / \text{Book Value of Equity}$
Net Income from non-cash assets	Equity reinvestment Rate = $(\text{Net Cap Ex} + \text{Change in non-cash WC} - \text{Change in Debt}) / (\text{Net Income})$	Non-cash ROE = $\text{Net Income from non-cash assets} / (\text{Book value of equity} - \text{Cash})$
Operating Income	Reinvestment Rate = $(\text{Net Cap Ex} + \text{Change in non-cash WC}) / \text{After-tax Operating Income}$	Return on Capital or ROIC = $\text{After-tax Operating Income} / (\text{Book value of equity} + \text{Book value of debt} - \text{Cash})$

I. Expected Long Term Growth in EPS

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- When looking at growth in earnings per share, these inputs can be cast as follows:
 - Reinvestment Rate = Retained Earnings/ Current Earnings = Retention Ratio
 - Return on Investment = ROE = Net Income/Book Value of Equity
- In the special case where the current ROE is expected to remain unchanged

$$\begin{aligned}g_{\text{EPS}} &= \text{Retained Earnings}_{t-1} / \text{NI}_{t-1} * \text{ROE} \\ &= \text{Retention Ratio} * \text{ROE} \\ &= b * \text{ROE}\end{aligned}$$

- In 2008, using this approach on Wells Fargo:
 - Return on equity (based on 2008 earnings)= 17.56%
 - Retention Ratio (based on 2008 earnings and dividends) = 45.37%
 - Expected growth rate in earnings per share for Wells Fargo, if it can maintain these numbers.

$$\text{Expected Growth Rate} = 0.4537 (17.56\%) = 7.97\%$$

One way to pump up ROE: Use more debt

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Return on Equity = Return on capital + D/E (ROC - i (1-tax rate))

where

Return on capital = $EBIT_t (1 - \text{tax rate}) / \text{Book value of Capital}_{t-1}$

D/E = BV of Debt / BV of Equity

i = Interest Expense on Debt / BV of Debt

- In 1998, Brahma (now Ambev) had an extremely high return on equity, partly because it borrowed money at a rate well below its return on capital
 - ▣ Return on Capital = 19.91%
 - ▣ Debt/Equity Ratio = 77%
 - ▣ After-tax Cost of Debt = 5.61%
 - ▣ Return on Equity = $ROC + D/E (ROC - i(1-t))$
 $= 19.91\% + 0.77 (19.91\% - 5.61\%) = 30.92\%$

II. Expected Growth in Net Income from non-cash assets

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- A more general version of expected growth in earnings can be obtained by substituting in the equity reinvestment into real investments (net capital expenditures and working capital) and modifying the return on equity definition to exclude cash:
 - ▣ Net Income from non-cash assets = Net income – Interest income from cash (1- t)
 - ▣ Equity Reinvestment Rate = (Net Capital Expenditures + Change in Working Capital) (1 - Debt Ratio)/ Net Income from non-cash assets
 - ▣ Non-cash ROE = Net Income from non-cash assets/ (BV of Equity – Cash)
 - ▣ Expected Growth_{Net Income} = Equity Reinvestment Rate * Non-cash ROE
- The equity reinvestment rate, unlike the retention ratio, can be higher than 100%, and if it is, the expected growth rate in net income can exceed the return on equity.

Estimating expected growth in net income from non-cash assets: Coca Cola in 2010

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- In 2010, Coca Cola reported net income of \$11,809 million. It had a total book value of equity of \$25,346 million at the end of 2009. Coca Cola had a cash balance of \$7,021 million at the end of 2009, on which it earned income of \$105 million in 2010.
 - ▣ Non-cash Net Income = $\$11,809 - \$105 = \$11,704$ million
 - ▣ Non-cash book equity = $\$25,346 - \$7,021 = \$18,325$ million
 - ▣ Non-cash ROE = $\$11,704 \text{ million} / \$18,325 \text{ million} = \mathbf{63.87\%}$
- Coca Cola had capital expenditures of \$2,215 million, depreciation of \$1,443 million and reported an increase in working capital of \$335 million. Coca Cola's total debt increased by \$150 million during 2010.
 - ▣ Equity Reinvestment = $2215 - 1443 + 335 - 150 = \957 million
 - ▣ Reinvestment Rate = $\$957 \text{ million} / \$11,704 \text{ million} = \mathbf{8.18\%}$
- Expected growth rate in non-cash Net Income = $8.18\% * 63.87\% = 5.22\%$

III. Expected Growth in EBIT And Fundamentals: Stable ROC and Reinvestment Rate

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- When looking at growth in operating income, the definitions are
 - ▣ Reinvestment Rate = $(\text{Net Capital Expenditures} + \text{Change in WC}) / \text{EBIT}(1-t)$
 - ▣ Return on Investment = ROC = $\text{EBIT}(1-t) / (\text{BV of Debt} + \text{BV of Equity-Cash})$
- Reinvestment Rate and Return on Capital
 - Expected Growth rate in Operating Income
 - = $(\text{Net Capital Expenditures} + \text{Change in WC}) / \text{EBIT}(1-t) * \text{ROC}$
 - = Reinvestment Rate * ROC
- *Proposition: The net capital expenditure needs of a firm, for a given growth rate, should be inversely proportional to the quality of its investments.*

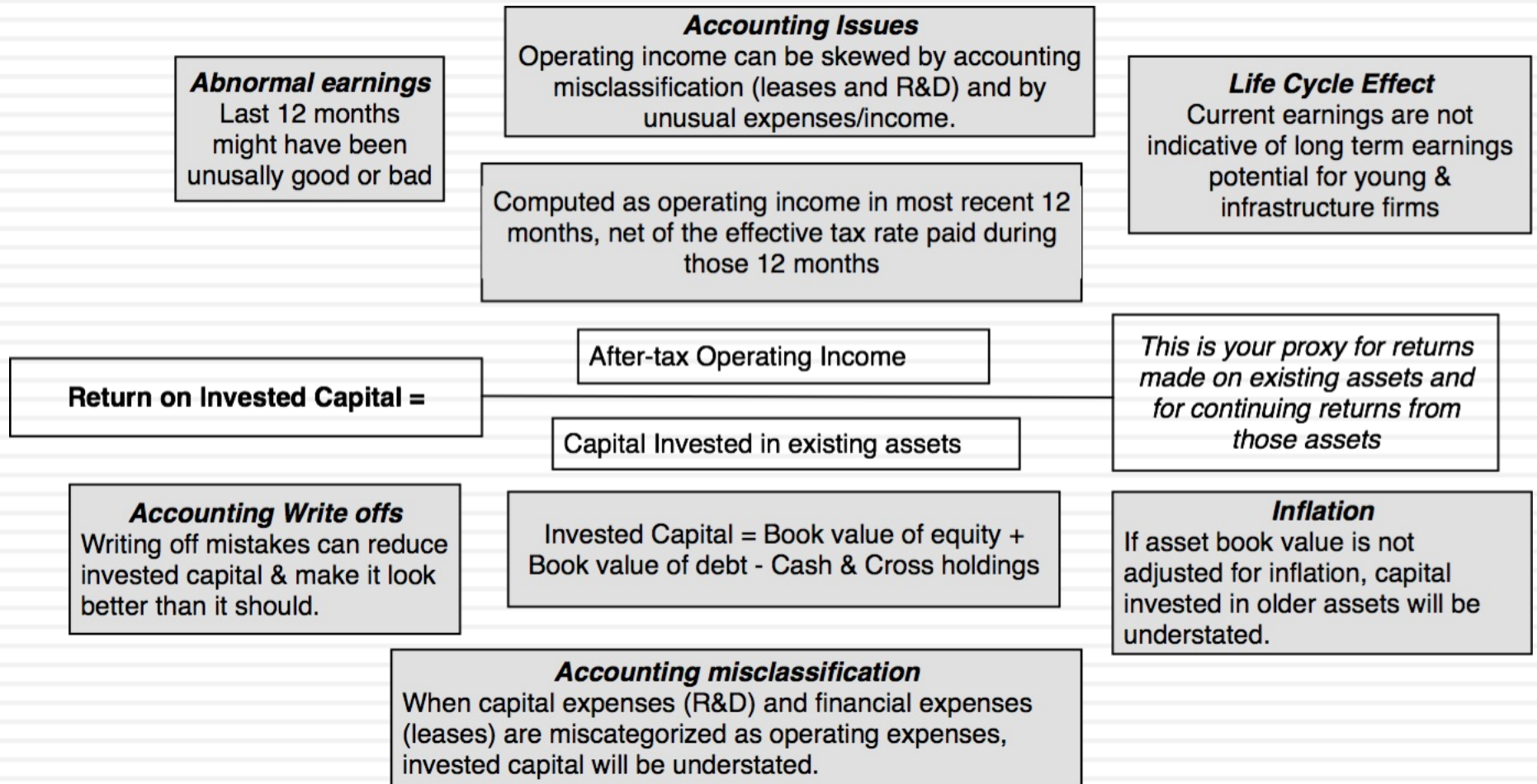
Estimating Growth in Operating Income, if fundamentals stay locked in...

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- In 1999, Cisco's fundamentals were as follows:
 - ▣ Reinvestment Rate = 106.81%
 - ▣ Return on Capital = 34.07%
 - ▣ Expected Growth in EBIT = $(1.0681)(.3407) = 36.39\%$
- As a potential investor in Cisco, what would worry you the most about this forecast?
 - a. That Cisco's return on capital may be overstated (why?)
 - b. That Cisco's reinvestment comes mostly from acquisitions (why?)
 - c. That Cisco is getting bigger as a firm (why?)
 - d. That Cisco is viewed as a star (why?)
 - e. All of the above

The Magical Number: ROIC (or any accounting return) and its limits

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IV. Operating Income Growth when Return on Capital is Changing

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- 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:

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

- **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

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	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%

$$\begin{aligned} \text{Expected growth} &= \text{Growth from new investments} + \text{Efficiency growth} \\ &= \text{Reinv Rate} * \text{ROC} + (\text{ROC}_t - \text{ROC}_{t-1}) / \text{ROC}_{t-1} \end{aligned}$$

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.

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Growth IV

Top Down Growth

Estimating Growth when Operating Income is Negative or Margins are changing

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- 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

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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*: Growth in total market, as technology and market conditions change.

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Market Share

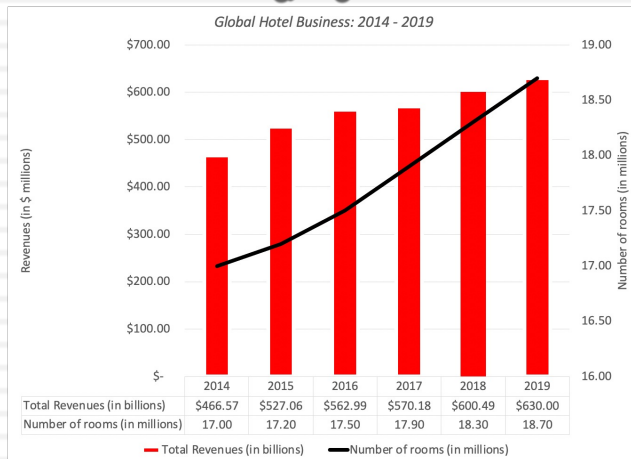
1. *Company's current market share*: If company's current market share is low, potential for growth in market share at expense of competition.
2. *Industry economics*: Nature of the business (a few big winners or splintered competition).
3. *Strength of company's competitive advantages*: Stronger and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

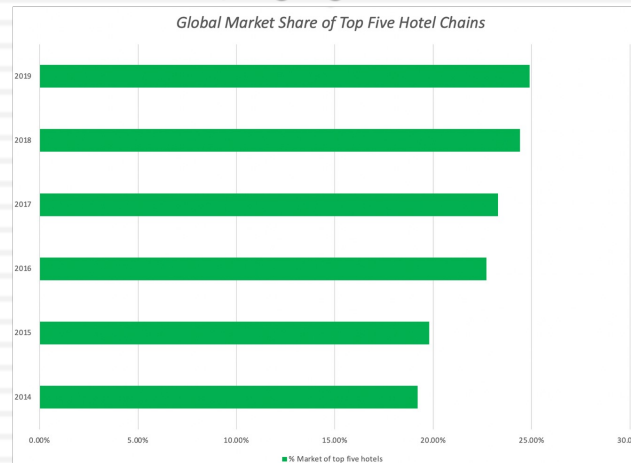
Airbnb: Total Market

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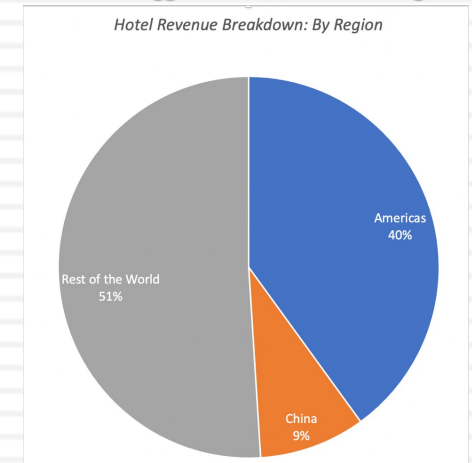
The market is big, but growth has slowed



It is concentrated, and getting more so...



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

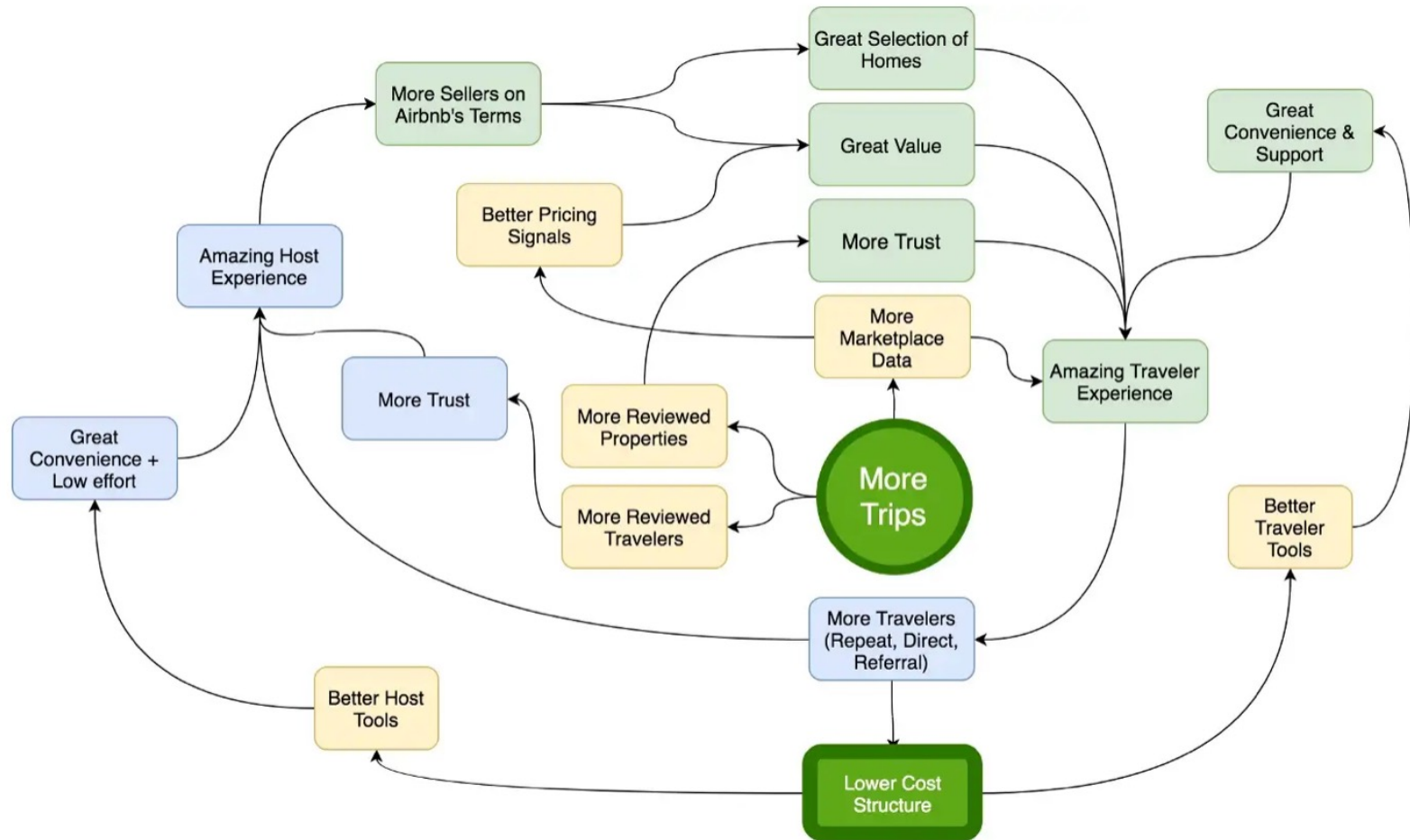


In its prospectus, Airbnb has expanded its estimate of market potential to \$3.4 trillion, as evidenced in this excerpt from the prospectus:

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

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2. Target Margins (and path there)...

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Operating Margin: Target and Pathway

