

JOEL SHAPIRO

Agency Subsidization at FinGain, Part 2

It's 7 pm, you've had a long day, and you'd much rather be Door Dash-ing sushi and watching Netflix tonight. But your mentor asked you to grab a drink, and you typically find meetings with her really valuable – you just couldn't reasonably say no. So, into the bar you head...

She asks you what you've been working on, and you speak – somewhat excitedly – about the valuation project that you've just completed at FinGain. After a bit, she says “well, couldn't you possibly make this analysis even better by predicting the annual revenue and attrition rate for each agency, and not just looking at firm-wide averages?” You're not entirely sure what she means, so she explains further.

“I just began a new side gig as strategic advisor to a company that launches and manages dental clinics. It's potentially big business, and they're growing like crazy. They face the same problem as FinGain – should they subsidize new clinics to help them succeed? Or are they better off just letting the struggling clinics die off? We have a data scientist on staff who has mapped this out a bit more fully. Basically, as I understand it, he correlates historical information about each clinic to year-over-year revenue and annual survival rates, which can be used to generate individual-level predictions, which might translate into customized subsidies or even other interventions. Why don't you come by our office and we can show you what we've done?”

A week later, you're in their offices, listening intently to their data scientist explain: “Over the next 6 months, we're planning on opening 23 new clinics. I've built a model that allows us to predict first year profitability and annual likelihood of attrition for each clinic, based on a range of variables – location, extent of local competition, historical health care spending in surrounding zip codes, dentists' prior experience and training, initial size of the clinic, and more. Let me show you those projections now.”

He shows you the accompanying spreadsheet, and continues:

“We've actually played around with subsidies quite a bit, doing lots of A/B testing to determine whether subsidies work, and what the optimal subsidy amount should be for any given clinic. Basically, it comes down to a pretty simple calculus: for every \$1,000 of cost we cover in year 1, the likelihood of attrition decreases by about four percent. But that's really the only effect we see – we only provide subsidies in the first year, and once

they make it past the first year, we don't see any differences in attrition between those clinics that do and don't receive the subsidy in the first year.”

You clarify a few other points, summarized here:

- The measure of “Value” provided to you is the gross revenue sent from the clinic to the home office. Assume that all costs of serving a given agency are independent of the gross return.
- Gross return growth is remarkably consistent across clinics: you should assume an increase of 15% in the second year and 7% annually thereafter.
- An 8% discount rate and a 5-year time horizon are most appropriate here.
- The data provided to you assumes no subsidy is given – that is, it provides the baseline attrition rates. The marginal effect of the subsidies can be clarified thusly: subsidies affect only the first-year attrition rate, and no other relevant parameters. The subsidy has a “log reduction” effect, which means here that the first \$1,000 of subsidy reduces the year 1 attrition rate by 4%. The second \$1,000 subsidy yields a 4% reduction of the rate with a \$1,000 subsidy, and so on. As an example, consider the case of a clinic with a 10% likelihood of attrition in year 1:

Amount of subsidy	Year 1 likelihood of attrition	Notes on Calculation
\$0 (baseline)	10%	
\$1,000	9.6%	= 10% * 0.96
\$2,000	9.216%	= 9.6% * 0.96
\$3,000	8.847%	= 9.216% * 0.96
\$4,000	8.493%	and so on...
...	...	
\$10,000	6.648%	
...	...	

Question 1. What is the value of each clinic without any subsidy?

Question 2. What is the optimal subsidy that should be given to each clinic to maximize the value of each? (Note: this question is asking for the optimal subsidy for EACH of the 23 clinics.)

Question 3. What is the *total* return on investment for the 23 subsidies? (E.g., one aggregate answer only, not 23 different ROI calculations.)