# Homework #3: Managing Agency Value at FinGain

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Please refer to excel sheet for detailed calculations.

## Part 1

**Thought process**: We are asked to calculate value of agency to home office and home office takes 20 % of revenue of agency. So, I am performing all the calculations of LTV on 20 % of yearly revenue of an agency. That calculation will determine how much home office is benefited by these agencies.

**Please refer to excel sheet for detailed calculations.**

### Without Subsidy

| Fill in only yellow cells | | | | | | |
|---|---|---|---|---|---|---|
| **Annual discount rate** | 8% | | | | | |
| | | | | | | |
| **Year** | **0** | **1** | **2** | **3** | **4** | **5** |
| **Agency Revenue** | | $1,200,000.00 | $1,260,000.00 | $1,323,000.00 | $1,389,150.00 | $1,458,607.50 |
| **Home Office Revenue** | | $240,000.00 | $252,000.00 | $264,600.00 | $277,830.00 | $291,721.50 |
| **Cost of service** | | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 |
| **Cost of marketing** | | | | | | |
| **Subsidy** | | | | | | |
| **Customer Profit** | $0.00 | $240,000.00 | $252,000.00 | $264,600.00 | $277,830.00 | $291,721.50 |
| **Churn / Attrition rate** | N/A | 14.6% | 11.3% | 10.7% | 8.4% | 7.9% |
| **Prob. of being active at end of period** | 100.00% | 85.40% | 75.75% | 67.64% | 61.96% | 57.07% |
| **Average prob. of being active in period** | 100.00% | 92.70% | 80.57% | 71.70% | 64.80% | 59.51% |
| **Profit expected on average** | $0.00 | $222,480.00 | $203,048.75 | $189,710.75 | $180,043.56 | $173,617.79 |
| **Present value of Expected Profits** | $0.00 | $214,081.48 | $180,910.88 | $156,506.57 | $137,529.05 | $122,796.88 |
| **Cumulative LTV...** | **$0.00** | **$214,081.48** | **$394,992.36** | **$551,498.92** | **$689,027.98** | **$811,824.86** |

### With Subsidy

| Fill in only yellow cells | | | | | | |
|---|---|---|---|---|---|---|
| **Annual discount rate** | 8% | | | | | |
| | | | | | | |
| **Year** | **0** | **1** | **2** | **3** | **4** | **5** |
| **Agency Revenue** | | $1,200,000.00 | $1,260,000.00 | $1,323,000.00 | $1,389,150.00 | $1,458,607.50 |
| **Home Office Revenue** | | $240,000.00 | $252,000.00 | $264,600.00 | $277,830.00 | $291,721.50 |
| **Cost of service** | | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 |
| **Cost of marketing** | | | | | | |
| **Subsidy** | $30,000.00 | | | | | |
| **Customer Profit** | -$30,000.00 | $240,000.00 | $252,000.00 | $264,600.00 | $277,830.00 | $291,721.50 |
| **Churn / Attrition rate** | N/A | 9.9% | 11.1% | 10.6% | 8.7% | 8.0% |
| **Prob. of being active at end of period** | 100.00% | 90.10% | 80.10% | 71.61% | 65.38% | 60.15% |
| **Average prob. of being active in period** | 100.00% | 95.05% | 85.10% | 75.85% | 68.49% | 62.76% |
| **Profit expected on average** | -$30,000.00 | $228,120.00 | $214,450.61 | $200,708.78 | $190,295.35 | $183,094.17 |
| **Present value of Expected Profits** | -$30,000.00 | $219,508.57 | $191,069.63 | $165,579.66 | $145,360.04 | $129,499.36 |
| **Cumulative LTV...** | **-$30,000.00** | **$189,508.57** | **$380,578.20** | **$546,157.86** | **$691,517.90** | **$821,017.26** |

**Question 1: Agency Valuation Calculations:**

a) What is the 5-year value of an agency that does NOT receive a subsidy?
b) What is the 5-year value of an agency that does receive a subsidy?

**Answer 1:**

a) 5-year value of an agency to home office that does not receive a subsidy is 811,824 USD
b) 5-year value of an agency to home office that does receive a subsidy is 821,017 USD

**Question 2: Managerial Implications:**

a) From an agency value perspective, is it a good idea to provide a $30k subsidy. to an agency in its first year?
b) Please be sure to make clear all the assumptions that are needed to answer. part (a).

**Answer 2:**

a) Cleary CLV of an agencies to home office with subsidies is greater than those which don't receive subsidies. This means that subsidized agencies are more profitable in long run than the non-subsidized ones. We can clearly see from the above example as well the ROI for home office by providing an initial subsidy of 30k USD is ~31 % which is quite significant.
b) Assumptions that are needed to answer part a) are:
    1. Attrition rates are constant throughout the year. They do not vary from month to month.
    2. Cost of services and marketing are assumed to be 0 in this case as we just need to calculate the value which is returned to home office.
    3. Discount rate for present value calculation is assumed constant at 8 %
    4. The % increase in revenue remains constant per year at 5 %
    5. The CLV value beyond 5 years is not considered.
    6. The financial relationship between home offices and agencies is constant at 20 %

## Part 2

**Thought process:** It is clear from the problem statement; we are given the revenue which the home office [Agency] gets from each clinic. So, to calculate the PLV and CLV of the clinics to their respective home offices, I have utilized the CLV template provided. Once I get the Present Value of each year per agency, I summed them up to calculate agency wise CLV.
To find the optimal subsidy value, I have used Solver to optimize the overall CLV of all agencies.

**Please refer to excel sheet for detailed calculations.**

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

| LTV | Total Revenue | |
|---|---|---|
| | | New Agency ID |
| $ 621,012.09 | $ 19,883,759.70 | 1001 |
| $ 319,155.83 | | 1002 |
| $ 1,156,073.52 | | 1003 |
| $ 890,316.31 | | 1004 |
| $ 1,121,469.75 | | 1005 |
| $ 1,088,285.06 | | 1006 |
| $ 1,196,804.36 | | 1007 |
| $ 768,049.39 | | 1008 |
| $ 1,022,557.08 | | 1009 |
| $ 843,107.63 | | 1010 |
| $ 686,583.83 | | 1011 |
| $ 1,060,602.54 | | 1012 |
| $ 783,674.28 | | 1013 |
| $ 903,730.21 | | 1014 |
| $ 633,377.90 | | 1015 |
| $ 577,217.39 | | 1016 |
| $ 1,170,355.27 | | 1017 |
| $ 532,851.17 | | 1018 |
| $ 1,081,761.54 | | 1019 |
| $ 950,195.49 | | 1020 |
| $ 1,043,177.17 | | 1021 |
| $ 373,152.53 | | 1022 |
| $ 1,060,249.37 | | 1023 |

**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.)

| Subsidy (in 1000 USD) | LTV | Total Revenue | |
|---|---|---|---|
| | | | New Agency ID |
| 21 | $ 633,251.22 | $ 20,447,470.05 | 1001 |
| 0 | $ 319,155.83 | | 1002 |
| 43 | $ 1,228,384.67 | | 1003 |
| 24 | $ 906,477.94 | | 1004 |
| 34 | $ 1,161,325.78 | | 1005 |
| 37 | $ 1,139,455.01 | | 1006 |
| 23 | $ 1,211,674.08 | | 1007 |
| 30 | $ 797,310.88 | | 1008 |
| 30 | $ 1,052,163.31 | | 1009 |
| 14 | $ 848,235.92 | | 1010 |
| 25 | $ 704,829.97 | | 1011 |
| 30 | $ 1,088,421.49 | | 1012 |
| 32 | $ 816,886.44 | | 1013 |
| 29 | $ 929,802.73 | | 1014 |
| 12 | $ 636,609.23 | | 1015 |
| 13 | $ 581,341.86 | | 1016 |
| 39 | $ 1,228,133.49 | | 1017 |
| 22 | $ 547,086.54 | | 1018 |
| 18 | $ 1,090,277.26 | | 1019 |
| 15 | $ 955,656.54 | | 1020 |
| 29 | $ 1,070,155.81 | | 1021 |
| 0 | $ 373,152.53 | | 1022 |
| 42 | $ 1,127,681.50 | | 1023 |

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

Answer 3:

a) Net Return = Subsidized LTV – Unsubsidized LTV = 20,447,470 – 19,883,759 = 563,710 USD
b) % ROI = Net Return / Total Subsidy = 563,710 / 562,000 = 100%

| ROI Calculation | |
|---|---|
| Revenue without Subsidy | $ 19,883,759.70 |
| Revenue with Subsidy | $ 20,447,470.05 |
| Total Subsidy | $ 562,000.00 |
| Change in Revenue | $ 563,710.36 |
| ROI | 100% |