Plan Management Navigator
Analytics for Health Plan Administration

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Please see page 5 for our invitation to participate in the 2023 Sherlock Benchmarks.

APPLICATION OF ECONOMIES OF SCALE STUDY FOR SMALL PLANS

Focus on Independent / Provider – Sponsored Plans

Some smaller health plans considering the *Sherlock Benchmarks* have wondered whether their size differences could limit the benchmarks' applicability. While the plans in our universe of Independent / Provider – Sponsored Plans (IPS) range from 200,000 to 1.5 million members, many plans serve fewer than 100,000 members. For those plans, the effect of scale on their operating costs may be an important consideration. Yet in the November 2022 edition of *Plan Management Navigator*, we note that the effect of scale is relatively modest, "so that a doubling of the size of the health plan will lead to those costs subject to economies of scale that are 79% to 91% of the pre-doubling PMPM costs." Since only 20% to 43% of total administration is subject to scale, the ultimate effect of a doubling in membership is a reduction in PMPM costs of 3% to 6%. For those plans that are much smaller, however, these modest scalar effects can take on a greater weight.

In this edition of *Navigator*, we provide a practical means of estimating the effect of scale on relative costs and use a similar model to estimate the effect of membership growth on costs. These models can be employed by smaller plans (or any size plan) to put the Benchmarks in context of their own size. We get into the weeds on the application of the scale slopes published in *PULSE* and summarized in *Navigator*. In those studies, we identified functions that were subject to economies of scale in sets of IPS plans, Blue Cross Blue Shield Plans (Blue) and the combination of all those health plans (All Plans). The difference between the *Navigator* and the *PULSE* analyses is that the latter includes slope values, expressed as BCG lopes. (Boston Consulting Group slopes express the effect on costs of a doubling of the size of the of the health plan. For example, a 91% BCG slope means that after doubling the size of the plan, expenses subject to scale are 91% of their pre-doubling value. It is calculated by raising 2 to the power of the slope.)

We use an IPS plan as an example in this edition because there are more of those plans that operate at relatively small scale. But the same logic that applies here will also apply to other universes.

Effect of Scale on a Plan's Cost

Figure 1 shows how the results of our scale study are applied to consider the effect of scale on a plan's relative costs. In *PULSE*, for the set of all plans in both universes, the BCG slope for expenses other than Miscellaneous Business Taxes is 90.5%. (Miscellaneous Business Taxes, stemming from state laws, are impractical to manage so we exclude them from our analyses.) All slopes are expressed as the logarithms of the PMPM costs and the member months to convert the curves that model scale relationships to straight lines. BCG slopes for All Plans and Blue are 96.7% and 93.7%, respectively. Only the Blue relationship is significant with a p-value of 0.080.

In this example, suppose an IPS health plan had the same PMPM costs as the median reported in the July 2022 edition of *Plan Management Navigator* of $45.65. Based on the BCG slope, what would the predicted PMPM costs be if the health plan had 45,000 members?

Figure 1 shows how this predicted value is calculated, including the Excel ® formulas. It is the application of the health plan's values to the regression line of $y = mx + b$, where m is the slope of = -0.1448 and b is the y-intercept of 2.2151. This figure also entails conversion from logarithms to actual member months and PMPM values.

Figure 1. Application of Economies of Scale for Small Plans
The Effect of Scale on a Small Plan's Costs

Step	Description	Value	Note	Component of Equation
1	BCG Slope from *Navigator* 2022.	90.5%	Calculated by Sherlock Company	
2	Regular, non-BCG slope.	-0.1448	Base 2 log of BCG slope in step 1: =LOG(0.905,2)	$y = \mathbf{m}x + b$
3	Member Months of a 45,000 Member Plan.	540,000	Multiply 45,000 by 12.	
4	Natural log of Member Months.	13.1993	Calculated as: =LN(540000)	$y = m\mathbf{x} + b$
5	Regular slope times log of Member Months.	-1.9108	Step 2 x 4	$y = \mathbf{mx} + b$
6	y-intercept.	2.2151	Calculated by Sherlock Company	$y = mx + \mathbf{b}$
7	Indicated y value from linear formula.	0.3043	Step 5 + 6	$\mathbf{y} = mx + b$
8	Predicted Scale Ratio.	1.3557	Exponential function of Indicated y: = EXP(0.3043)	
9	PMPM Costs from Health Plan.	$45.65	Assumed equal to universe.	
10	Indicated Costs, Scale Adjusted	$61.89	Step 8 x 9	
11	Difference	$16.24	Step 10 - 9	

While the calculations are explained in the figure, some of the steps benefit from further explanation.

Step 2. Here, the BCG slope of 90.5% is converted to a regular slope. The reference to "Base 2" comes from the fact that the BCG slope is expressed as the situation where the size of the plan is doubled, which entails raising 2 to a power equal to the slope. Thus, taking the base 2 log of the BCG slope gives you the regular slope. It is negative since there are some economies of scale.

Step 6. The y-intercept is 2.2151. For the Blue plans, that value is 1.5127 and for All plans it is 0.7042. With these y-intercept values one may estimate the effect of scale on that plan given the norms for plans as a whole. That is, the entire linear equation of $y = mx + b$ can be employed to predict a ratio of scale-adjusted norm to the reported norm.

Step 7. This value is the sum of the product of the slope and natural log of the member months and the y-intercept

Step 8. This value is the exponential function of the value in step 7, which converts back from a ratio of natural logs to a ratio of PMPM values.

Step 10. This is the product of the predicted scale ratio and the actual results for the plan, which we set equal to the universe norm of $45.65 PMPM.

The $61.89 can be thought of as the scale-adjusted norm for a plan operating at a small size of 45,000 members. The slope is not significant at a p-value of 0.112, and the R^2 of 18.2% means that scale is a limited explanation for a given plan's costs. Besides scale, execution is among other factors that may contribute to cost differences.

Applying the Scale Slopes without the Y-Intercept

Figure 2 returns to the purpose of BCG slopes published in November 2022. These slopes predict the effect of scale changes irrespective of the baseline volumes of membership. Put a different way, it assumes that the plan's scale and costs are given, and the question is what the effect of changes in scale is, given this baseline. In this case, we model the effect of a 50% increase of the 45,000 member plan so that its 540,000 member months becomes 810,000 member months.

As in Figure 1 we convert the BCG slope to a regular slope in Step 2. The Indicated Percent Difference in Costs, Step 5, is calculated as 1 plus the percent increase (50% here) raised to the power of the slope calculated at Step 2. If there had been a 100% increase, the percent differences in that value would be 90.5%, the same as the BCG slope. Here, at a 50% membership increase, it rises to 94.3%.

Step 7 calculates the Indicated Costs at the new scale, that is, the product of the Indicated Percent Difference in Costs times the plan's actual costs of $45.65, and so the indicated cost at the new scale is $43.05 PMPM.

To reiterate, the y-intercept is not necessary for the application of the scale slope to a health plan that grows. It is only necessary for determining the relative costs if one takes scale into account.

Considerations

Unlike the PMPM values published last July, the models for the effects of scale are based on statistical studies. Importantly, they are abstracted more distantly from the results of the participating plans than our published medians. They also vary each year: while IPS plans had a BCG slope for expenses other than Miscellaneous Business Taxes 90.5% in the 2022 cycle, the equivalent value for the prior year was 98.7%.

Also, while in this *Navigator* we are using scale slopes calculated from total expenses excluding Miscellaneous business taxes, the scale studies published in November calculate scale slopes based on individual functions: their slopes and statistical significance varies. While the approach shown here has the virtue of simplicity, the November approach is probably more realistic.

Figure 2. Application of Economies of Scale for Small Plans
The Effect of Growth on Cost

Step	Description	Value	Note
1	BCG Slope from *Navigator* 2022.	90.5%	Calculated by Sherlock Company
2	Regular, non-BCG slope.	-0.1448	Base 2 log of BCG slope in step 3: =LOG(0.905,2)
3	**Suppose a membership increase of**	50.0%	Assumed
4	Intermediate Step	1.50	1 plus membership growth rate: =(1+0.50)
5	Indicated Percent Difference in Costs	94.3%	Step 4 raised to power of regular slope: = 1.50 ^ (-0.1448)
6	PMPM Costs from Health Plan, Equal to Ur	$45.65	Assumed, provided by Sherlock Company
7	Indicated Costs at New Scale	$43.05	Step 5 x 6
8	Difference in Costs	-$2.60	Step 7 - 6
9	Difference in Costs, as Percent of Original	-5.7%	Step 8 / 6

Invitation to Participate in the 2023 Sherlock Benchmarking Study

The highly valid, well-populated *Sherlock Benchmarks* provide an unbiased ranking and help prioritize cost management activities to have the greatest impact on improving your health plan's overall operating performance.

The 2023 study will be the 26th consecutive year, reflecting a cumulative experience of 966 health plan years. Since June of 2019, health plans serving at least 210 million people have licensed the *Sherlock Benchmarks* including most Blue Cross Blue Shield plans, public companies and the largest Independent / Provider – Sponsored health plans. For the most recent cycle of the *Sherlock Benchmarks*, of the 33 U.S.-based Blue Cross Blue Shield primary licensees, 16 serving approximately 49.1 million people participated in the Sherlock Benchmarks for Blue Cross Blue Shield Plans. For Independent / Provider – Sponsored Plans, 15 plans serving 10.6 million people participated in the most recent cycle. Of the 15 members of the Alliance of Community Health Plans that are not focused on public programs or are staff-model plans, six participated in that year's Sherlock Benchmarking Study for Independent / Provider – Sponsored health plans. Four of the 10 largest commercial-focused Health Plan Alliance members participated in last year's *Sherlock Benchmarks*.

The *Sherlock Benchmarks* have been called the "Gold Standard" by leading health care consultants. Report publication begins in late June but varies by universe. Participation entails efforts on the part of the plans since actionable outputs require relatively granular inputs. However, the cost is relatively modest.

The *Sherlock Benchmarks* are also available to license.

Contact

Please do not hesitate to contact us with questions concerning this analysis, *PULSE*, the *Sherlock Benchmarks* on which it is based, or your interest in licensing the 2022 edition or participating in the 2023 *Sherlock Benchmarks*.

You will be among good company.

We can be reached at sherlock@sherlockco.com or (215) 628-2289.

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