Plan Management Navigator
Analytics for Health Plan Administration

Healthcare Analysts

Douglas B. Sherlock, CFA
sherlock@sherlockco.com

Christopher E. de Garay
cgaray@sherlockco.com

Erin Ottolini
erin.ottolini@sherlockco.com

John Park, CFA
jpark@sherlockco.com

Andrew L. Sherlock
asherlock@sherlockco.com

(215) 628-2289

Participants and licensees of the 2019 Sherlock Benchmarks *should have received analytical tools to help then estimate the effect of mix changes. This is timely in the current environment. Please reach out to us if you have not received these analyses since similar tools capturing the effect of scale are in the works.*

Short-term Economies of Scale: Growth in Membership and Health Plan Administrative Costs

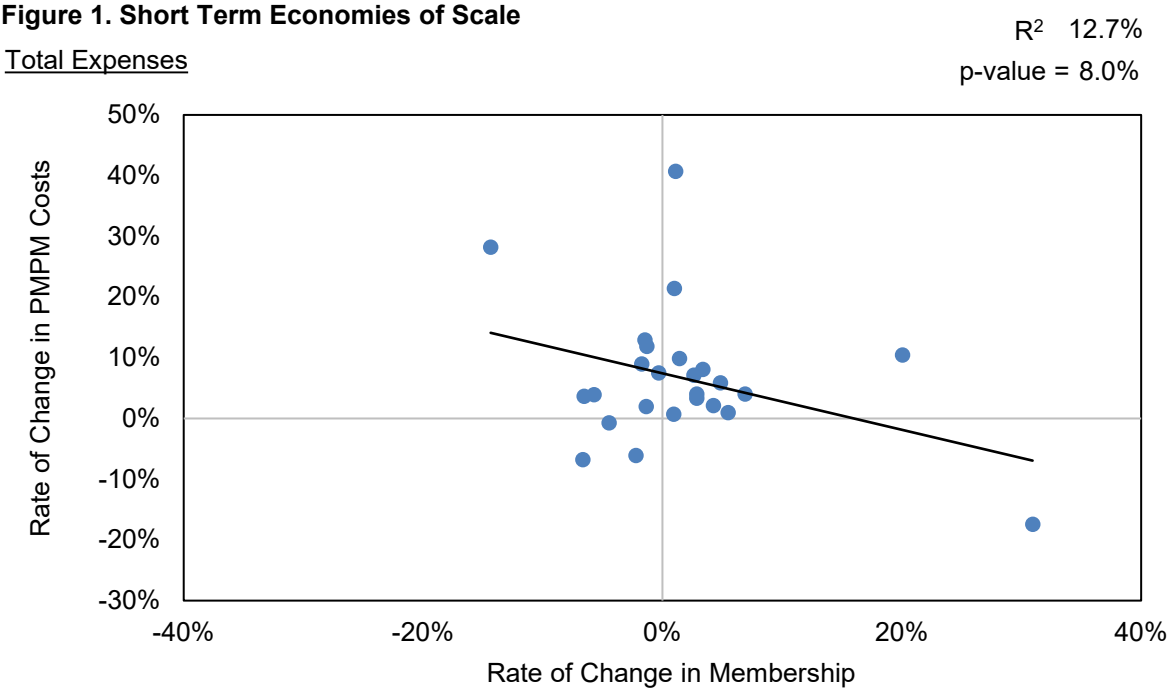
Conventional wisdom holds that there are administrative economies of scale in health insurance. This can certainly be a manager's experience when volume unexpectedly surges or declines.

This analysis explores the source of conventional wisdom: the relationship between short-term health plan membership growth and cost trends. As we discuss below, many functions display a relationship in which as membership grows, costs decline. The behavior of total expenses, shown below, illustrates this.

Note that the question of short-term economies of scale is a different issue from the relationship between size and costs in a single, annual period. Such an analysis ignores the effect of growth on costs. Our *Navigator* of February 2020 addressed this.

By contrast, this edition of *Plan Management Navigator* is based on *rates of change* in membership between two periods, ignoring the effect of actual plan size.

Figure 1. Short Term Economies of Scale



Background: Short-Term and Long-Term Economies of Scale

Economies of scale are understood to be the relationship between volume, unit prices, variable costs and fixed costs. Participants in an industry with minimal variable costs and high fixed costs are subject to economies of scale since. At a given price and contribution margin, additional volume yields sharp increases in profits since most of the costs are fixed. That the concept is so important to financial analysts is evidenced by the analysts' warhorse - the cost-volume-profit analysis.

In determining whether costs are fixed or variable, the period in which performance is measured is an important consideration: nearly all costs are variable over twenty years, nearly all costs are fixed over one day. For health plans, approximately one-half of costs are staffing, which can be "right-sized" relatively rapidly, though not instantly. The accounting treatment of health plan facility costs, however, typically reflects a duration of 7-24 years while the duration for information systems costs is 2-6 years.

Thus, a health plan could display economies of scale during the short term but not over the long term. For example, suppose a health plan builds an infrastructure sufficient for an expected volume of members. The infrastructure includes information systems, customer service representatives, case managers and so forth. That capacity is based on observations of frequency of calls per member, how many members will be ill enough to require case management services and what proportion of claims can be expected to be autoadjudicated. Over a single year, investments in these areas are at least "sticky" if not fixed: employees are hired and processes established assuming a volume of members and their underlying service requirements.

As a result, managements carefully consider their assumptions about the requirements of each member since they bear on customer satisfaction and are sometimes even codified by employers as performance standards. Accordingly, managers invest in resources with a certain number of members in mind. These estimates are just that because they cannot control the pricing and other competitive behaviors of industry rivals. They also cannot control for unexpected environmental factors such as the current adaptation to Covid-19.

Health plans' inability to adjust for actual versus estimated volumes can mean that costs that are variable over the intermediate term can behave like fixed costs in the short term. A short duration time-series analysis, such as the subject of this analysis, can measure short-term scale.

By contrast, measuring scale at a single point in time ignores the effect of changes in membership. Since change of membership is not considered, only the actual scale is the focus of such a cross-sectional analysis. This impact of scale may or may not be diluted by the past experience of unexpected membership changes in the plans. It may also the case that those unfulfilled expectations are countervailing, making cross-sectional analyses of the cost-membership relationship effectively a measure of long-term scale. As we published in the February 2020 *Navigator*, we have found that only a minority of health administrative expenses are subject to scale. Long-term scale studies are the most commonly performed by Sherlock Company. Past years' studies are available in past editions of *Plan Management Navigator* and *PULSE*.

The Effects of Scale in the Short Term

As displayed on the first page, Figure 1 shows the relationship between changes in membership and changes in total administrative costs. We exclude the effect of Miscellaneous Business Taxes which are not usually manageable. Background on how we performed this analysis including a description of participants is found towards the end of this analysis.

At a p-value of 0.08 the modeled relationship between the trends is only 8.0% likely to be the result of chance, specifically the chance that the sample analyzed is unrepresentative of the population as a whole. The phrase "statistically significant at the 5% level" means that the p-value is below that percent. The 5% threshold is common in social sciences, and we have customarily used a more aggressive 10% (p-value of 0.100) threshold to cast a wide net for economies of scale.

The R^2 of 12.7% means that the relationship between growth and costs explains that percent of the difference between the variables. When we report the slope as 0.465 percentage points, which means that for every 1 percentage point increase in membership growth, cost growth would decline by 0.465 percentage points (pp). See the notes in Figures 2 and 4 for examples.

Since a 100% increase in membership is rare, dividing by 100 yields more familiar results. In this example, we report the slope as 0.34 percentage points, which means that for every 1 percentage point increase in membership growth, cost growth would decline by 0.34 percentage points (pp). The ratio of change in membership growth to change in costs is the same as the original calculation but the expression of the slope is more intuitively appealing in light of actual health plan experience. See the notes in Figures 2 and 4 for examples.

Growth and Clusters of Expenses

As shown in Figure 2, both Sales and Marketing, Medical and Provider Management and Corporate Services have p-values that achieve our threshold for statistical significance, at 0.008, .091 and 0.022 respectively. Sales and Marketing is notable in its steeper slope of -0.83 pp versus -0.58 pp for Medical and Provider Management. Its R^2 is higher at 26.9%.

Neither Account and Membership Administration alone nor the sum of Account Membership Administration and Corporate Services (Core Expenses) showed a statistically significant relationship between growth and cost trends.

Figure 2. Short Term Economies of Scale

Rate of Membership Growth and PMPM Cost Growth, by Cluster

Function	R-Squared	Slope*	p-value	Number of Plans
Sales and Marketing	26.9%	-0.83	0.8%	25
Medical and Provider Management	11.9%	-0.58	9.1%	25
Account and Membership Administration	0.2%	-0.10	85.0%	25
Corporate Services	20.9%	-0.67	2.2%	25
Account and Memb. Admin. plus Corporate Services	2.4%	-0.28	45.8%	25
Total Expenses	12.7%	-0.46	8.0%	25

*Slope here represents the percentage point change in expense growth for every percentage point increase in membership growth. For example, suppose a plan has 5% membership growth in year 1 with 10% Sales and Marketing cost growth. If in year 2 the plan increases its membership growth rate 1 percentage point to 6%, from the above, it can expect its Sales and Marketing cost growth to decline by 0.83 percentage points to 9.17%.

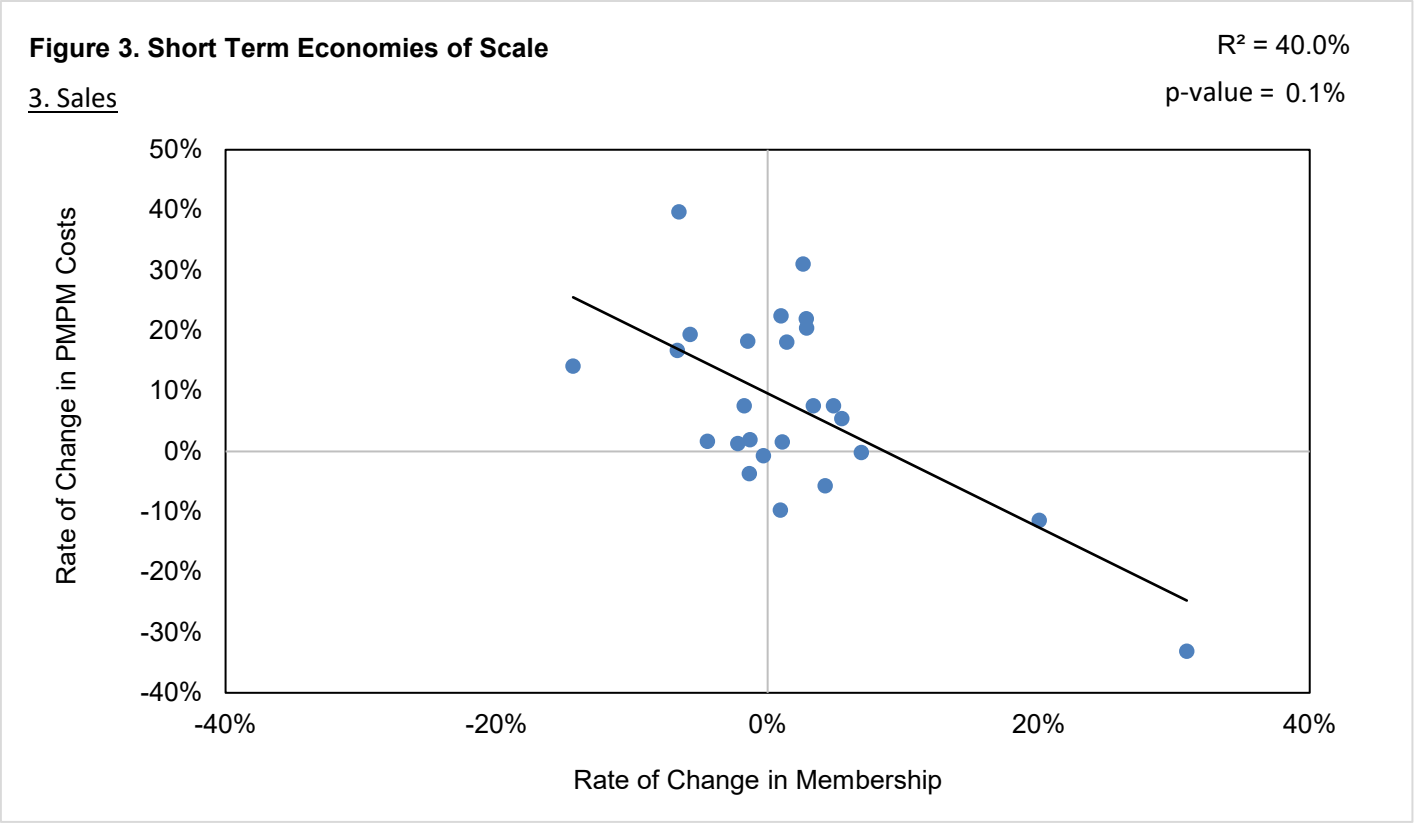
Growth and Expense Functions

Of the 16 functions, five showed cost trends that had a statistically significant relationship with growth. All the significant functions had negative slopes.

Sales and Marketing Cluster had most of the significant negative relationships, as shown in Figure 2. This Cluster comprises Rating and Underwriting, Marketing, Sales, External Broker Commissions and Advertising and Promotion. The Marketing and Advertising and Promotion Functional Areas were not strongly linked to growth. Within this cluster, as shown in Figure 3, Sales drove the cost growth related to membership growth with an R^2 of 40.0%. Rating and Underwriting and Broker Commissions also displayed a significant relationship in which, as membership grew, the cost growth diminished, shown in Figure 4.

The negative relationship between costs growth and membership growth would be expected to stem from the fact that many of the costs are over the short term and only partially associated with membership trends. This is easier to understand for the Rating and Underwriting function, than for Sales and Broker Commissions.

Figure 3. Short Term Economies of Scale



Changes in the costs of the Corporate Services cluster did have a significant relationship with short term membership growth, as shown in Figure 2, and the functions of Finance and Accounting and Actuarial did as well. The latter are shown in Figure 4.

The Medical and Provider Management Cluster had p-value significance between growth and costs, as shown in Figure 2. However, neither of its underlying functional areas, Medical Management / Quality Assurance / Wellness and Provider Network Management and Services had a significant relationship.

Figure 4. Short Term Economies of Scale

Rate of Membership Growth and PMPM Cost Growth, by Function

Function	R-Squared	Slope*	p-value	Number of Plans
1. Rating and Underwriting	17.1%	-1.08	4.0%	25
2. Marketing	5.1%	-1.09	27.8%	25
3. Sales	40.0%	-1.11	0.1%	25
4. External Broker Commissions	15.3%	-0.65	5.3%	25
5. Advertising and Promotion	2.8%	1.46	42.1%	25
6. Provider Network Management and Services	9.7%	-0.83	12.9%	25
7. Medical Management / Quality Assurance / Wellness	4.0%	-0.38	33.8%	25
8. Enrollment / Membership / Billing	1.3%	-0.22	58.3%	25
9. Customer Services	10.8%	0.99	10.9%	25
10. Claim and Encounter Capture and Adjudication	3.1%	-0.30	40.3%	25
11. Information Systems Expenses	0.1%	-0.08	91.0%	25
12. Finance and Accounting	11.6%	-0.40	9.5%	25
13. Actuarial	14.3%	-0.80	6.2%	25
14. Corporate Services Function	7.4%	-0.64	18.9%	25
15. Corporate Executive & Governance	6.5%	-0.87	21.7%	25
16. Association Dues and License/Filing Fees	0.4%	-0.21	76.1%	24
Total Expenses	12.7%	-0.46	8.0%	25

*Slope here represents the percentage point change in expense growth for every percentage point increase in membership growth. For example, suppose a plan has 5% membership growth in year 1 with 10% Actuarial cost growth. If in year 2 the plan increases its membership growth rate 1 percentage point to 6%, from the above, it can expect its Actuarial cost growth to decline by 0.80 percentage points to 9.20%.

How We Performed this Study

This is a time-series study of the effect of a one-year change in membership on a one-year change in per member costs. Plans reported costs to us segmented into 16 principle functions. Total costs, all four clusters of costs and each of the functions was separately analyzed.

There were 25 plans included in the analyses in this *Navigator*. These were Independent/Provider-Sponsored and Blue Cross Blue Shield plans and they participated in the *Sherlock Benchmarks* during both 2018 and 2019 benchmarking cycles. Their size ranged from high tens of thousands to millions of members so these relationships are free of the high costs and explosive membership growth of start-ups.

Unlike most of our long term economies of scale studies, we did not adjust to eliminate the effect of product mix differences between the years. While each plan differs, perhaps greatly, in their product mix, the year over year differences in any given plan's product mix is more modest. Accordingly, when we calculate changes for each of the 25 plans in this analysis, neither changes in membership nor costs eliminate the effect of product mix differences between the two years.

For Further Information

We hope that you won't hesitate to reach out to us concerning this article.

Douglas B. Sherlock, CFA
President
Sherlock Company

sherlock@sherlockco.com
Phone: 215-628-2289
Fax: 215-872-9838
1180 Welsh Road, Suite 110
North Wales, PA 19454

www.sherlockco.com

Appendix A: Functions Included in Each Administrative Expense Cluster

The 16 main functional areas of administrative expenses used in our benchmarking study are grouped into four clusters to gain an overall perspective. Most of the functions have sub-functions. When totaled, there are 60-70 functions and subfunctions into which each plan segments administrative costs. They are grouped as shown below. Miscellaneous Business Taxes are excluded from the Corporate Services cluster for the purposes of this analysis. Subcategories of functions are also omitted.

Sales and Marketing

- Rating and Underwriting
- Marketing
- Sales
- External Broker Commissions
- Advertising and Promotion

Medical and Provider Management

- Provider Network Management and Services
- Medical Management / Quality Assurance / Wellness

Account and Membership Administration

- Enrollment / Membership / Billing
- Customer Services
- Claim and Encounter Capture and Adjudication
- Information Systems Expenses

Corporate Services Cluster

- Finance and Accounting
- Actuarial
- Corporate Services Function
- Corporate Executive and Governance
- Association Dues and License/Filing Fees