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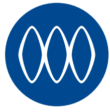

Milliman USA
Consultants and Actuaries

Benefits Perspectives
Current Issues in Employee Benefits

WINTER 2002-2003

- Maintaining the Connection with Employees When Administration is Outsourced
- Can Your Health Plan Bankrupt Your Company?

Gauging Your Company's BeneFitness

by Jeff Lane

As the company's human resource representative, you are explaining the benefits program to a potential mid-career hire. You pull out a chart that shows the anticipated benefit dollars that will be earmarked for her in each benefit category. You also highlight your company's overall and benefit-specific ranking, both within your industry and across the geographic region, for someone in her salary bracket. She smiles, impressed that your description of the company's benefit programs can be supported by more than self-serving, subjective snippets about a plan's features.

Knowing how your company's benefit program stacks up against others in corporate America or a target group of competitors provides your organization the critical information that can help your company through changing benefit trends and economic cycles.

This article explains how a benefits benchmarking tool can financially quantify a benefits program, thereby giving employers greater understanding of the cost of the program and providing them a better means to communicate the underlying costs and value of each benefit plan component. This article describes Milliman's work with *Money* magazine and showcases how a comprehensive, flexible model can be used by employers of all sizes, from any industry or geographic region, and with varied employee demographics to determine the BeneFitness of their programs.

Show Me the *Money*

Consultants from Milliman USA recently assisted *Money* magazine with an analysis of the relative values of the benefit programs for 109 of the *Fortune* 300 companies (see *"Corporate America's Best Benefits"* in the December, 2002 issue). We used our benefits benchmarking tool to compare the benefits offered by the survey respondents and then ranked the companies according to the value those programs would provide to a *Money*-specified employee profile (i.e., an employee aged 50, earning $100,000 annually, with 10 years of service but subjected to benefit plan provisions available to new hires).

We studied five primary benefit areas:

- healthcare coverage (medical, dental, and flexible spending accounts);
- retiree medical benefits;
- retirement programs (defined benefit and defined contribution pension plans);
- vacation time; and
- other benefits (e.g., long-term disability insurance, life insurance, and employee stock options).

Milliman determined the true "actuarial" cost of each of the benefit programs, allowing us to make an "apples to apples" comparison of the cost of providing defined benefit plans and retiree health packages with the annual employer outlays for defined contribution plans and active healthcare coverage.

Employers' Outlay for Benefit Programs

According to the 2002 Bureau of Labor Statistics (BLS) study on private industry workers, employers were earmarking almost 19% of payroll on voluntary benefits for

their workforces. Adding legally required benefits (such as Social Security and workers' compensation benefits) boosts the average to 27.3% for all workers. For employers that desire more than a general guidepost, the problem with comparisons using the BLS data is the lack of refined information, especially for specific employee demographics and types of industry. More often than not, employers want to know how their benefits program costs compare against target competitors or within their region.

How much an employer earmarks for its benefits program will depend on many factors. An employer's size, its financial success, its benefits philosophy, its workforce demographics, and its geographic region all influence the dollars to be allotted. Whether the employer is publicly traded, whether it is a public institution or agency, and whether there is a unionized workforce also are significant determinants. Economic forces also influence spending on benefits; labor shortages in a booming environment tend to call for greater spending on compensation, but in a stagnant or volatile market, a cautious approach is taken. And in the competition to recruit and retain good workers, an employer is likely to examine its salary and benefits structures both as separate and combined components.

In the case of *Money's* profiled employee, we calculated the average annual benefit value to be $29,951, or about 30% of pay (see Chart 1) for the surveyed firms. The amount represents nonlegally required benefit contributions. The top 25% of respondents provide an annual benefit value of at least $34,900, while the top 5% provide a benefit value of at least $43,450 (over 43% of pay)!

These impressive values would be even higher if we had considered the actual "grandfathered" programs available to current 50-year-old employees with 10 years of service instead of examining the programs available exclusively to new hires. Many corporations, for example, have abandoned retiree medical coverage for new hires in recent years or have limited participation in their generous defined benefit plans to longer-term employees while creating more portable features under retirement plans for new workers. Our analysis also considered the average vacation costs based on time granted above the US standard of two weeks for new hires. Thus, if a company provided exactly two weeks vacation for an employee with 10 years of service, no employer vacation value was imparted to that company for vacation benefits.

Healthcare Benefits for Current Employees

In the area of health benefits for active workers, 66% of the employers polled provide at least three medical options, with health maintenance organizations (HMOs), preferred provider organizations (PPOs), and fee-for-service (FFS) arrangements most prevalent, as shown in Table 1. Point-of-service (POS) options were not as popular.

Most of the *Money* survey-group are multistate firms, and thus potentially enjoy greater bargaining power with insurers and other healthcare providers. Furthermore, the "law of large numbers" often provides them with more stable plan experience and allows them to insure/self-insure at a lower rate. According to a Kaiser Family Foundation (KFF) survey, workers' average monthly premium for family coverage was $174 in 2002, but in firms with more than 5,000 employees, the average monthly premium dropped to $157. Respondents to the *Money* survey typically paid for

CHART 1

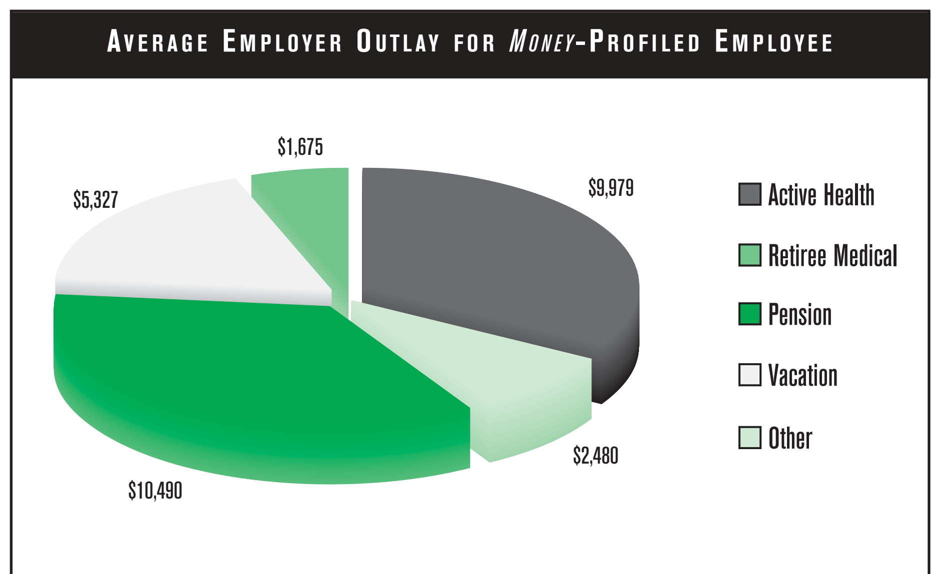

TABLE 1

AVERAGE MONTHLY HEALTHCARE PREMIUMS AND EMPLOYER SUBSIDY FOR FAMILY COVERAGE					
	Money Group			KFF Group*	
Option	# of Cos.	Employee Premium	Employer Subsidy	Employee Premium	Employer Subsidy
FFS	64	$133.74	82%	$143	77%
HMO	101	$132.74	79%	$144	78%
POS	59	$139.99	80%	$157	75%
PPO	90	$144.72	80%	$190	71%

*Data for firms with 5,000+ employees

about 80% of the premiums' cost, while those studied by the KFF provided a smaller subsidy (see Table 1). The federal government's program covering federal workers covers about 70% of the cost of premiums for healthcare benefits.

With regard to health costs, Milliman's *Health Cost Index* shows an overall increase of 10.8% for the year ending October 2002. For HMOs alone, 2002 premium rates were between 16% and 22% higher than in 2001, according to Milliman's *HMO Intercompany Rate Survey*, with a 17% increase projected for 2003. The average employee premium increase from 2001 to 2002 for employers in the *Money* survey was in line with these data figures, but the decision to pass on the full increase to employees varied considerably among the 64 companies that participated in both years of *Money's* study (see Table 2).

Retiree Health Coverage

Retiree healthcare coverage is one benefit that has forced many employers to do some belt-tightening due to the high medical inflation and accounting burdens that are affecting companies' bottom lines. The enormous expenses associated with these programs have led to fewer employers continuing to sponsor retiree health benefit plans, and virtually none are adopting them. Although the number of employers offering retiree medical plans has been steadily shrinking over the past two decades, 58% of the employers surveyed by *Money* still provide employer-subsidized retiree medical coverage to new hires. Sixteen respondents in the past five years froze their programs to new hires. A less draconian approach to reduce employers' escalating retiree medical costs is to establish a dollar or percentage limit on the amount of premiums the sponsor will absorb. Several companies are addressing retiree healthcare costs by establishing "defined contribution health" arrangements or allowing employees to equally share in the cost of pre-funding retiree medical coverage.

Retirement Benefits

The number of single-employer sponsors of defined benefit plans declined from 101,214 in 1975 to 36,000 in

TABLE 2

EMPLOYEE PREMIUM RATE INCREASE FROM 2001 TO 2002				
Option	Average Aggregate Increase	Median Increase	Highest Quartile Increase	Lowest Quartile Increase
FFS	21.34%	11.37%	31.13%	2.54%
HMO	27.49%	16.57%	50.00%	0.00%
POS	26.79%	13.85%	31.31%	2.99%
PPO	15.10%	13.84%	40.69%	0.00%

2002, according to a BLS/EBRI (Employe Benefit Research Institute) estimate. However, much of the decline has been among small employers. Meanwhile, the BLS/EBRI study also estimates an increase in sponsors of defined contribution plans, from 207,437 to 700,000 over the same period. The stock market performance in recent years may have heightened employee appreciation for defined benefit plans, with their reliable monthly payments during a period of market turmoil, but it is churning the stomachs of corporate plan sponsors. Companies that sponsor defined benefit plans have incurred a double whammy of low interest rates and a drop in plan assets, generating large pension costs that ripple onto their bottomlines.

For the *Money* study, Milliman analyzed both the defined benefit and defined contribution plans in tandem, thus enabling us to analyze how employees' retirement needs were being met in total. For the defined benefit plan component, we estimated the annual employer outlay necessary to fund the expected retirement benefit. This expected retirement benefit reflected the probability of an employee remaining with the employer until full retirement age and earning future salary increases. We then determined the employer's annual cost to fund an individual's retirement benefit.

For the target demographic, the average employer outlay for retirement benefits was $10,490 per year. This average was split nearly equally between defined benefit plan expenditures ($5,216) and defined contribution outlays ($5,274). Employees working for the surveyed companies are provided a solid retirement benefit. We estimated the approximate percentage of final earnings that the combined retirement programs would replace for a 40-year-old working to age 65 (see Table 3). The analysis assumes that employees contributed 6% of pay into the defined contribution plan, generally enjoying the maximum employer match. We also assumed that their total defined contribution monies earned 7.5% per year.

Defined Contribution Plans

All of the surveyed companies sponsor a defined contribution plan. With the exception of one firm that temporarily suspended contributions, all of the respondents provide either a match on employee elective deferrals or a profit-sharing/money purchase contribution. Forty-eight of the companies automatically direct some of the employer contribution into company stock, although 11 firms allow the employee to reallocate this money immediately into other funds. Eighty-two of the respondents offered "catch-up" contributions during 2002.

For our target demographic, the average employer contribution (profit-sharing plus matching amounts) was 5.32% of pay, assuming that employees were always contributing at a level that would maximize the employer match. About 13% of the surveyed group provided a matching percentage that varied by the employee's deferral percentage, commonly reducing the match from 100% to 50% for deferrals below 4% of pay. For an employee contributing 6% of pay, the average percentage for the employer match was 62% among the 100 companies that provided a match; 41 of these companies provide an additional profit-sharing plan contribution, averaging 5%.

Defined Benefit Plans

Eighty-four of the 109 firms sponsor a defined benefit plan. Among many large firms there has been a significant move-

TABLE 3

TOTAL RETIREMENT REPLACEMENT RATIOS

Money Percentile Ranking	With Employer $ Only	With Employer $ and 6% Employee $	Total Replacement (includes Social Security)
25th percentile	32.2%	56.8%	80.8%
50th percentile	41.6%	66.2%	90.2%
75th percentile	52.6%	77.2%	101.2%
95th percentile	70.8%	94.9%	118.9%

ment towards nontraditional or "hybrid" defined benefit plans, particularly cash balance and pension equity plans.

Conclusion

Benchmarking your employee benefit programs on a regular basis—annually or every few years, depending on the benefits environment or plan design changes—can provide critical information for keeping your plans competitive. The capability to analyze your benefits against any target group of employers for any specified employee demographic can provide your company real insights into the value of your programs. This information can ultimately be shared with employees or recruits. The underlying benefit values may be determined according to an individual's age, salary, service, gender, and marital status. Furthermore, armed with such data, an employer may tweak or overhaul its benefit plans to see how the company's benefit competitiveness would change. Lastly, the ability to provide objective data to current employees and prospective hires, improve communications with workers, and gain a better financial picture should make "stepping on the BeneFitness scale" a sound business practice.

Jeff Lane is an associate actuary in Milliman's Washington, DC office. Adrien LaBombarde, an associate actuary in the Houston office, peer reviewed this article.

Maintaining the Connection with Employees When Administration is Outsourced

by Lorraine Lepler

While cost containment remains the primary reason for outsourcing noncore business functions, there are now other equally important drivers. Gaining the expertise and superior tools of the service provider—without making significant internal capital investments—and freeing the company's professionals to focus on strategic, profit-generating, or value-added activities are among the most commonly cited. But some human resource (HR) managers are uncomfortable balancing the competing pressures to reduce costs and streamline administration while providing high-quality services and programs, particularly if they joined the profession when administering programs emphasized face-to-face interaction with employees.

Rapid technological advances, coupled with the proliferation of service providers offering Internet-based administration, have made outsourcing affordable and attractive to employers of all sizes. This article illustrates how personnel professionals can keep the "human" in outsourced HR functions. It also highlights tools and methods that enable HR professionals to focus on strategic work rather than the tedium of benefits administration.

Employee Self-Service and Data Exchange

The capability to maintain personal data, view context-specific information, and initiate benefits transactions according to personal life events is empowering for employees. Employee self-service originated with "interactive voice response" (IVR) and kiosk technologies, but due to its cost, was generally embraced only by larger employers. These early adopters of self-service paved the way for widespread acceptance of the self-service model. For a variety of reasons, Internet-based tools are quickly becoming the preferred method for employees to execute benefits transactions:

- Internet-based tools are function-rich and highly visual. They provide interaction and learning experiences superior to IVR, which, if paper-based, would be impossible or prohibitively expensive. The variability in Internet-based tool customization can in turn favorably influence the cost.

- Personal use of the Internet (outside of the employment context) has exploded and permeates individuals' daily lives. The convergence of formerly separate devices will undoubtedly fuel the growing demand for instantaneous and personalized experiences. Cellular telephones and personal digital assistants (PDAs) now access the Internet, receive email, and store data, as well as record and disseminate digital photographs. Internet access is even available on the dashboards of some automobiles. Therefore, it is inevitable that employees will access the Internet more frequently, in more places—not just at work or at home—and at any time. As a result, the Internet will continue increasing in importance for HR and benefits administration.

- Internet use has led employees to expect convenient, one-stop access to benefit products and to welcome self-service solutions from their employers, with the expectation that information will be personalized. In the benefits context, employees seek resources to help them make life-event driven decisions. Secure applications allow employees to tailor their searches for expert guidance for their individual issues. Intelligently conveyed content based on employees' family status, health, habits, and known risks delivered at the appropriate times could translate to enhanced utilization and improved health management.

- The employer could also ultimately benefit from both the diminishing reliance on staff for simple queries and the potential reduction in healthcare utilization costs. Internet-based sites must maintain employees' privacy by gathering only aggregate data and prohibiting the viewing of individually identifiable information by others.

Some may argue that where there is self-service, human interaction does not exist. However, most automated and streamlined self-service applications deliver personalized information dynamically, in the context of the employee's data and selections. The applications, when augmented by search capabilities and a knowledgebase (a repository of content), can produce information in the format sought by the employee (i.e., side-by-side comparisons of plan provisions, "what-if" scenarios, and text). In addition, from a single login, the employee can, for example, elect a health plan on the HR information system, view updated data on the payroll system, and immediately use or apply for benefits through the insurance carrier's system seamlessly and in real-time. This experience was not possible in the pre-Internet world. Employees might rate their experience and satisfaction under this type of system as superior to traditional, face-to-face approaches.

As empowering as these tools are for employees, they are equally liberating for benefits managers by reducing and possibly eliminating extensive manual efforts formerly needed to:

- distribute, collect, and process forms;
- test programming required to export and import data;
- administer the periodic data exchanges;
- reconcile data; and
- resolve employees' problems resulting from the time lag between data collection and processing.

Many of the administrative tasks apply across the HR and benefits functions and systems. Reducing or eliminating the duplication of effort and the redundancy of data can streamline processes, and many employers have chosen to do so via outsourcing some of the HR and benefits components. Commonly outsourced functions include administration of employee benefit plans, employee assistance programs, and outplacement services.

Manager Self-Service

Outsourcing process administration does not equate to abdication of responsibility. The forces shaping employee self-service also drive manager self-service. The outsourcing provider's tools may, for example, allow the benefits manager to:

- *Approve transactions* that are outside the boundaries of the outsourcing provider's authority (i.e., pension disbursements over a set dollar limit). Online tools consolidate the information required for the decision, eliminating the need for phone calls, postal mail, and fax. The manager approves the transaction via the Internet and thus need not be in the office to keep the process moving.

- *Assess the effectiveness of outsourced processes.* Via the Internet, managers may view summary statistics about outsourced processes and utilization of Internet-based resources to track trends, as well as determine the hard and soft returns on administrative investments.

Interaction with Employees

Web-based tools are ideal for communicating detailed information to employees and for managing the transactional workflows. However, employees differ in their preferences for receiving information. An employer can be responsive to these needs by considering a variety of approaches to communications:

- *Call centers,* whether outsourced or staffed internally, satisfy the desire for human contact. Call centers may be used to handle only nonroutine matters, requiring employees to first view content via self-service tools. A knowledgebase ensures that consistent information is provided, and if desired, in the "voice" of the employer (e.g., the employer produces specific answers to frequently-asked questions). "Nonexpert" call center representatives can also effectively use a knowledgebase, which reduces labor costs.

- *Face-to-face meetings* can address substantive issues rather than handle administrative matters. These meetings provide the desired face-to-face contact, as well as a forum for direct employee feedback on the value of programs and plans.

- *Corporate newsletters and intranet sites* may feature information about an outsourcing arrangement and how it affects employees, particularly during implementation or transition phases.

Enhanced Communications

Outsourcing providers generally offer standard content and spread the development costs over several clients. To maintain the personal touch, the provider may:

- Establish "standard" documents to display only material applicable to the participant. Alternatively, standard documents may be organized to help the participant quickly identify applicable information and ignore extraneous content.

- Include the employer's logo and signatures of the employer's staff on communications materials.

- Provide ancillary materials or other custom communications that carry the desired tone and message, as well as reflect the employer's culture.

Implementation Strategy

Introducing an outsourcing arrangement and accompanying technology affects the employer's HR staff and its employees, who are the customers in the process. Successful implementation relies on strategies that acknowledge the human factors, such as:

- *Designing new self-service tools* to incorporate the "look and feel" of other applications used by the employer or its employees. A familiar design can be intuitively navigated, and demonstrates concern for the user's needs.

- *Grouping self-service tools together at a single gateway* to allow users to access multiple tools via a single system login and minimize frustration.

- *Providing for an orderly transition* that can include initial training of outsourced call center representatives and an on-site presence when the center becomes operational.

- *Conducting employee/customer satisfaction surveys* to measure the provider's performance and maintain the employer's connection to the process.

Conclusion

Although outsourcing and applied technology have undoubtedly changed the nature of HR and benefits work and diminished the need for face-to-face interactions with employees, they also have enabled professionals to focus on adding value for employees and the organization. Freed from routine administrative functions, HR and benefits professionals have time to concentrate on humanizing the workplace and implementing strategic programs to attract, develop, and retain a skilled and motivated workforce. For those who originally entered HR and benefits to serve people, the function has come full circle.

Lorraine Lepler is an outsourcing and communications consultant in Milliman's New York office. This article was peer reviewed by Jill Bergman, a consultant in the New York office.

Can Your Health Plan Bankrupt Your Company?

By Shontel S. Meachem and Charles M. Waldron

Has anyone in your company considered the possibility that the health benefit plan could bankrupt the company, or at least severely affect the company's capital position? The probability is higher than one might think, notwithstanding the purchase of stop-loss reinsurance to protect the company from unexpectedly severe financial results.

To ensure that health plans do not cause a company's financial ruin, benefit plan managers should assess the adequacy of the funds set aside for their health plans and determine the proportion of the company's capital the plans could possibly need. This article describes how a model developed by Milliman USA can evaluate the capital needs for an employer's self-funded medical benefits plan.

Rising Healthcare and Stop-Loss Insurance Costs

Since 1998, healthcare costs have spiraled upward. In 2003, most employers face double-digit healthcare cost increases. Healthcare utilization by employees is also highly volatile, making the incidence of cancers, heart attacks, or other illnesses and diseases occurring in a plan difficult to predict. In such an environment, quality information and solid risk management are essential for self-funded medical plans.

Many companies that self-fund their health benefits must also grapple with the rising costs of stop-loss reinsurance, which pays for claims that exceed a specified amount. To keep such costs from overwhelming company budgets, many employers over the years have significantly increased the stop-loss "attachment point" (the maximum amount the employer will pay before stop-loss reinsurance pays). Higher stop-loss attachment points ease stop-loss budgets initially, but require a company to assume more of the risk. Thus, any initial savings will likely be paid out in claims because the company is responsible for claims up to a higher limit.

Analyzing Adequacy

Most companies record a liability known as "incurred but not reported" (IBNR) each year. This is the *expected amount* of claims for services already performed that history suggests will be reported after the end of the year. This expected amount is the best estimate of the remaining amounts that ultimately will be paid for the previous year, and generally does not consider potential variations in experience due to volatility. Due to this inherent volatility in healthcare costs, actual experience is likely to differ from these expected amounts. If a plan's experience is good in a given year, then the IBNR will be sufficient to pay all claims. If a plan's experience is poor in a given year, then the IBNR will be insufficient to pay all claims. In a case where the IBNR has been understated, the company must rely on alternate sources of capital to pay all claims.

Many benefits plan managers might be tempted to hedge against this possibility by always setting the IBNR amount high. Over the long term, however, this strategy could prevent the company from making better use of its capital because too much is tied up by the health plan's IBNR. On the other hand, setting IBNR consistently at too low a level runs the risk of absorbing capital earmarked for a profitable expansion of the company or other business uses. Consequently, setting the IBNR at a realistic level is a goal most health plans should strive to achieve.

Capital Assessment

Even with an appropriate IBNR set, the company's financial executives will want assurances that the health plan will not absorb a large portion or all of the capital the company has. To provide such assurances, a review of the plan's recent medical claims experience is necessary. This study will determine, with a reasonable degree of certainty, a level of capital the plan should identify as potentially needed to ensure sufficient funds to pay all claims. (This differs from the determination of the

expected level of claims, the best estimate of the year's claims, and the target amount to be funded via employer and employee contributions.)

Capital is the source of cash the health plan might need in excess of reasonably determined reserves and liabilities to fund adverse fluctuations in the plan's claims experience. Annual health plan gains (actual claims less than expected claims) increase the capital, while annual losses (actual claims exceed expected claims) decrease the capital. The simple model assumes that only the gains and losses from the health plan contribute to the ccmpany's capital (i.e., additional sources of capital from other business operations are not taken into account, and financial ruin occurs if the capital amount is negative at any time).

The study specifically examines the randomness and variances inherent in health benefit plan claims. If the expected claims amount is determined correctly, actual claims on average will fall below the expected amount half of the time and above the amount the other half. Our model simulates the randomness of claims filings and evaluates the probabilities of adverse claims experience. The model estimates a plan's capital needs and assesses the likelihood that the amount will be insufficient over a future period (e.g., one to five years).

The model projects the level of capital a company should prudently maintain to ensure sufficient funds not only for the expected level of claims, but also to absorb the adverse, unexpected fluctuations in claims that might occur. The amount of capital required depends on several factors:

- the adequacy of the contributions to cover the expected level of claims;
- the level and type of financial risk management products purchased, such as stop-loss reinsurance;
- the likelihood of significant adverse deviations (as described below) in claims experience;
- the plan's benefits; and
- the demographic characteristics of the plan's participants and beneficiaries.

Adverse deviations in claims experience are generally caused by two factors. The first is the risk that total claims in a year for all plan participants exceed the reasonably determined expected level of claims by a significant percentage. This risk is often not covered by a reinsurance product or only partially covered by an aggregate stop-loss reinsurance product. An aggregate stop-loss reinsurance product typically is designed to cover the aggregate claims if they exceed a stated percent (e.g., 125%) of the expected claims. In some instances, the aggregate stop-loss will have a cap, covering, for example, between 125% and 175% of the excess claims. If the risk falls outside these limits, the company must use its capital to cover the adverse experience.

The second factor is the risk that a single plan participant incurs a large amount of claims during the year. Some companies purchase specific stop-loss reinsurance to protect their capital from this type of risk. Under this type of product, all claims exceeding $200,000 per year per participant might be covered. Having a lower attachment point at which the stop-loss reinsurance starts paying claims costs more than establishing a higher attachment point. In recent years, many companies have raised the attachment point as the cost of this type of insurance increased. But doing so increases the likelihood that the company will run out of capital from adverse deviations in the aggregate claims.

Our study identifies and quantifies the likelihood of a company running out of capital—the "probability of ruin"—in the next one to five years due to the self-funded health plan's shortfalls. Ruin occurs if the "capital" element in our equation is negative at any time during the period.

Illustrating the Case

The value of ruin theory may be illustrated by using a hypothetical company that provides medical care coverage for employees under a self-funded arrangement. The firm has expected medical claims of $20 million after the recovery of claims from a stop-loss reinsurance policy that pays claims in excess of $200,000 annually per participant. The yearly expected medical cost trend is assumed to be 10% (i.e., increases in the cost per

service and utilization are expected to increase claims each year by 10%).

The company's plan is studied under the following scenarios:

Scenario One assumes the company starts with an initial capital level of $2.5 million or 12.5% of the annual expected claims. The $2.5 million is likely to cover any adverse fluctuations in the first year (i.e., the probability of ruin is less than 1%). However, by the fifth year, the probability of ruin increases substantially, to 21%: If the company only budgets the expected cost of claims each month for the five-year period, there is a 21% chance that it will use all of the initial capital sometime during that period. Without additional funds being allocated to capital, the company will be bankrupted and participants would not receive any further benefits. Furthermore, if this were a private company with total capital of $2.5 million, there is a 21% chance that the medical plan would bankrupt the company.

Scenario Two assumes initial capital to be $5 million or 25% of the annual expected claims. By doubling the initial capital to $5 million, the probability of ruin is significantly reduced over the five-year period. The probability of ruin within five years has decreased from the Scenario One's 21% to just 3%. A probability of zero does not guarantee there is sufficient capital; it only indicates that the probability of ruin is very small.

Our analyses in Scenarios One and Two assume that the expected claims for each year will be fully funded by the combination of employee plus employer contributions. To the extent that the contributions vary from the expected costs plus expenses, the probability of ruin will be different. For example, if the contributions were insufficient to cover the expected costs of the plan, the capital will be reduced by the total amount of the insufficiency. This suggests an examination of what happens if the expected claims are not accurately estimated.

Scenario Three uses the same assumptions as Scenario Two but illustrates the importance of having the expected medical costs as close to the "actual" expected costs as possible. In this scenario, "actual" expected medical claims are assumed to be 10% higher than the expected medical costs in each of the five years.

Table 1 presents the probability of ruin for the three scenarios. The model reveals that if the actual costs of the plan are consistently 10% higher than estimated or budgeted, the probability of ruin is 33% within three years, 64% within four years, and 86% within five years. While a consistent 10% under-budgeting might seem extreme, with just as little as a 2.5% shortfall every year, the probability of ruin in five years for Scenario Two increases to 13% from the 3% illustrated—more than four times the probability of assuming that actual claims exactly matched the amount budgeted!

The study revealed that even in the scenarios that anticipated actual medical costs with 100% accuracy, the randomness of the claims and resulting variance from expected claims must be considered to ensure that the company can meet its obligations under the plan. Our

TABLE 1

Scenario Number	Probability of Ruin within 1 Year	Probability of Ruin within 2 Years	Probability of Ruin within 3 Years	Probability of Ruin within 4 Years	Probability of Ruin within 5 Years
1	1%	5%	12%	16%	21%
2	0%	0%	1%	2%	3%
3	0%	3%	33%	64%	86%

study indicates that a plan with $20 million of expected claims might need as much as 25% of the annual expected claims in capital to cover the claims in the event of adverse experience.

An approach to reduce the risk (other than by retaining larger amounts of capital) could include purchasing aggregate reinsurance (i.e., a type of reinsurance that covers total claims if the total incurred claims for a given year exceeds a certain threshold in excess of the expected) or lowering the annual $200,000 per participant stop-loss reinsurance coverage threshold. Both types of reinsurance significantly reduce the likelihood of ruin, but they come at a higher price.

Consequently, accurately predicting the expected costs is essential to the financial success of the plan.

Conclusion

The possibility—in fact, the probability—that a company's health plan could bankrupt the company is greater than one might think. To ensure that your health plan does not financially ruin your company, an employer should assess the adequacy of the funds set aside for the health plan and determine the proportion of the company's capital the plan possibly needs. In an increasingly volatile healthcare environment, quality information and solid risk management could be essential to a company's survival. Although this article focuses on a self-funded health plan, the same type of analysis could be performed on a company's long- or short-term disability plans, workers' compensation programs, or retiree medical plans. In addition, a governmental self-funded plan could use the model to establish the size of an adverse experience contingency reserve fund; set the contribution rates to the contingency fund; or identify the likelihood of needing special allocations from the general fund and the amount necessary.

Shontel Meachem is an actuarial analyst, and Chuck Waldron is a consulting actuary, in Milliman's Hartford office. This article was peer reviewed by Bill Thompson, a consulting actuary, also of the Hartford office.

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