Non-Standard Basic Monthly Earnings Calculations For Long-Term Disability Insurance Contracts: A System Dynamics Examination

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Abstract

A required feature of a Long-Term Disability (LTD) insurance policy is its method of calculating Basic Monthly Earnings (BME), which determines how much a disabled customer will be paid. Most BMEs conform to some standard formula. However, to increase sales of its LTD policies, a large U.S.-based LTD company increased its use of Non-Standard BMEs (NSBME), which led to more errors and higher costs. Our model tested various processing approaches and found the optimal way to process these claims: an even mix of low-level Disability Benefits Specialists (DBS) and mid-level Benefits Financial Consultants (BFC). The costs of the BFC review were offset by the savings from all the errors they detected. Also, suspecting that he company's reliance on NSBMEs was an example of the "Fixes that Fail" and "Shifting the Burden" systems archetypes, we found that eliminating this practice was the highest leverage policy of all.

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Many people in the United States and Europe are covered (through individually-purchased or company-purchased coverage) by long-term disability (LTD) insurance contracts. LTD insurance is income protection against the possibility of debilitating illness or injury that might prevent these people from working. An important step in the process of formulating a disability insurance policy is the determination of the claimant's Basic Monthly Earnings (BME). This BME dollar amount is multiplied by a set percentage that is detailed in the policy, and the resulting figure is the amount of Disability Monthly Earnings that the claimant will receive from the insurance company. For example, if a claimant's BME is determined to be $2,000 and the predetermined percentage of income is 70%, the claimant would receive a check for $1,400 every month.

When the disability insurance policy is written, the customer has a choice of selecting one of the twelve or thirteen standard BME calculations. For example, in the United States, one of the twelve standard BMEs is a dollar figure that is based solely on the claimant's W-2 statement of earnings from the previous year. (In the U.S., employers issue W-2 forms, approved by the Internal Revenue Service, to their employees every January as part of the annual tax filing process.) If the customer does not want to use any of the standard BMEs, the broker has the option to use the "variable text version" of the BME. This allows the customer to formulate a BME calculation based on whatever factors they choose. This formulation can be as unorthodox as the customer wishes. For example, the non-standard BME text could read "Monthly earnings means 20% of my grandmother's monthly social security payment."

Research Problems

At a large U.S.-based disability insurance company, we explored some of the issues associated with Non-Standard BMEs (NSBMEs). At this company, the use of non-standard BMEs is growing. The sales force is driving this growth—many potential clients will purchase LTD contracts only if they can get NSBMEs, and the sales force is motivated to accommodate them. The result is higher sales. However, NSBMEs create claims processing issues for the insurance company. The biggest issues are the relative costs associated with use of these NSBMEs when processing disability claims. After initial discussion with managers from this company, we identified two distinct challenges:

1. The need to better identify and formalize the costs of NSBMEs. The goal here was to identify the *systemic* costs of NSBMEs.

2. If the costs are material, begin identifying policies that could reduce the cost of NSBMEs by identifying which changes would create the most leverage and be most enduring.

Further conversations yielded insights into the following issues:

Issue #1: The use of non-standard language necessitates that all of the company's employees who are involved in the processing of a claim using non-standard BME calculations must interpret the BME language individually. This situation provides the opportunity for the misinterpretation, misunderstanding and possible miscalculation of a claimant's BME.

Issue #2: The need for interpretation of non-standard BMEs requires various employees (Disability Benefit Specialists, Benefits Financial Consultants, etc.) to spend a significant amount of time on this task. Also, under the current system, once a BME is interpreted by one employee, there is no system to reuse this interpretation in the future, so even more employee time must be spent reinterpreting the Non-Standard BME at each stage in the claims process.

Issue #3: In many cases, the language utilized in a Non-Standard BME is not interpreted by the customer and the company in exactly the same manner. This problem is further exacerbated by how the original non-standard BME language may have been developed by an employee or employees who are no longer employed by the insured company. For example, if the HR director of a company develops a disability insurance policy based on a non-standard BME and then leaves the company, the next HR director may not interpret the BME in the same manner as it was originally intended.

Data Gathering

We interviewed the Director of Financial Consultants to get an orientation to the problem. We then interviewed a wider range of people who held roles like Benefits Financial Consultant (BFC), Disability Benefits Specialist (DBS), and DBS Manager. The data gathered at these interviews allowed us to create a causal loop diagram, and later an initial system dynamics model, which we refined through two additional meetings. Using this process, we and the clients achieved substantial consensus about the model.

Causal Loop Diagram

Increases in customer and broker expectations have fueled the desire to offer identical terms as a competitor or previous policy, which includes the prior BME, often non-standard, as shown in loop R1 of Figure 1. Loops B1 and R3, in the upper and upper right portions of Figure 1, describe the core effects of maintaining NSBMEs in the claims administration parts of the business. When NSBMEs increase, the relative efficiency of the claims organization decreases, resulting in increased cost per claim. These costs are borne either through decreased profitability or reflected in increased price rates, which negatively affect customer growth, completing the balancing loop by creating fewer NSBMEs than there otherwise would be (loop B1). As a secondary effect, normal organizational delays in addressing the growth of NSBMEs may lead to overtime, staff burnout, and higher error rates (loop R3).

While not immediately evident, accepting the effect on price rates will have a compounding effect over time on company growth because of the effect that higher rates have on new and existing customers (loop R2 at the lower left of Figure 1).

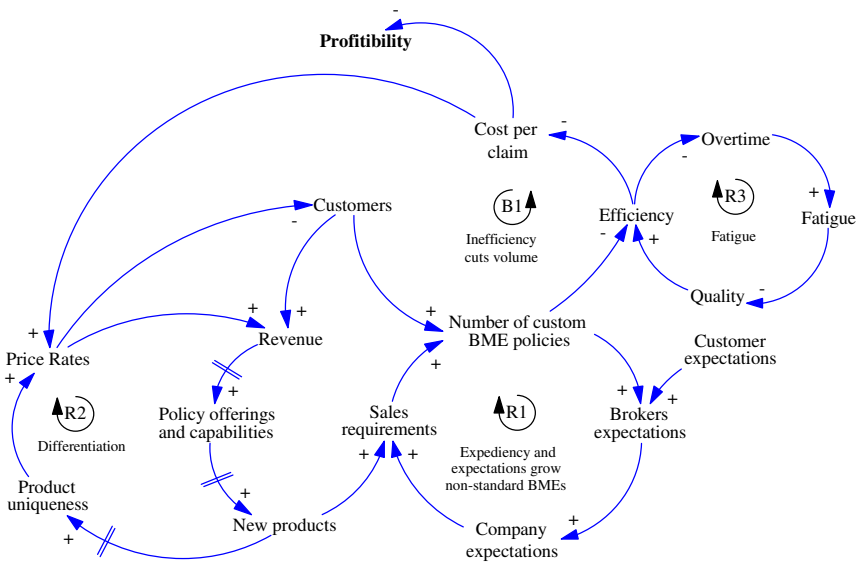

Figure 1
Causal Loop Diagram of the Non-Standard BME Issue

Stock and Flow Structure and Model

We converted the causal loop diagram into a system dynamics model. Figure 2 shows the core stock and flow structure of the model. (The model itself is provided as a separate supporting document; many of the details of the model are omitted from Figure 2 for clarity.) The model "directs" files along two paths—one path that requires only Disability Benefits Specialists (DBS) for processing (upper pipeline); and a path that requires other resources, namely Benefits Financial Consultants (BFC), for financial computation, along with DBS processing (lower pipeline).

The purpose of the model is to incorporate resource and file rate data acquired from interviews with the company to show how resources respond to flows through respective department groups. Costs (mainly through labor investment and error processing assumptions) and resource requirements are then calculated to show how departments and the company overall must respond to meet obligations. After comparing responses to various scenarios, one can assess the company's ability to meet these obligations and what might be done to improve overall response and company performance.

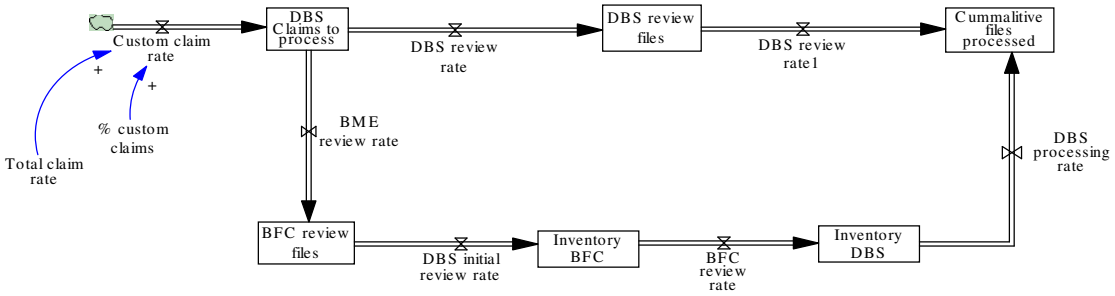

Figure 2
Core Stock and Flow Structure of NSBME Model

Wherever possible, we used the most accurate data that the company provided. Some key assumptions or approximations that were applied in the model include:

1. New policy claims of 17-18 per month per Disability Benefits Specialist (DBS) (17.5 used)
2. Non-Standard BME rates of approximately 10 of the 17-18 new claims processed per DBS.
3. A current DBS staffing level of 190 people with an average benefits-loaded cost of $32 per hour.
4. An average of 100 BME reviews provided per week by Benefits Financial Consultants (BFC).
5. An average of approximately 30 minutes per BME review provided by a BFC.
6. A current BFC staffing level of 10.4 people with an average benefits-loaded cost of $45 per hour.
7. Staff are assumed to be perfectly efficient; an FTE performs 40 hours of work at the full productive rate
8. Growth of BME usage increased to 77% (of 110,385 total policies) in 2005. This compares to 66% in 2004 (of 121,131 total policies).
9. Policy growth is assumed to be 12.5% moving forward. (The decrease in in-force policies shown in the previous bullet was because of the sale of some of the company's foreign operations.)
10. To determine the cost of BME driven policy errors, data were taken from July and August 2004; this included an error rate of 7.6% and an *absolute* cost of approximately $2478 per error.

The following cost areas were not quantified within the model:

1. Advanced Earned Income Credit (AEIC) costs caused by Non-Standard BME terms
2. Any costs related to potential litigation
3. Costs associated with lost revenue due to reduced persistence
4. Revenue impacts from the effects of errors or incremental costs on company rates
5. Potential lost revenue due to enforcement of standardized BME terms

The model has two sectors beyond the core structure shown in Figure 2. One keeps track of costs (Figure 3) and the other keeps track of time needed and claims processed per employee (Figure 4). Costs fall into three categories: (1) costs of deploying Disability Benefits Specialists (DBS), which are the "base cost" since these are definitely used in the processing of these claims; (2) costs of sending some of the claims to the Benefits Financial Consultants (BFC) as a method of catching errors; and (3) the costs of errors that have to be reworked. The time needed and claims processed per employee are measures of productivity and are therefore also efficiency measures. Both sections are concerned with efficiency, which is a major issue in the situation faced by this company given its liberal NSBME policy.

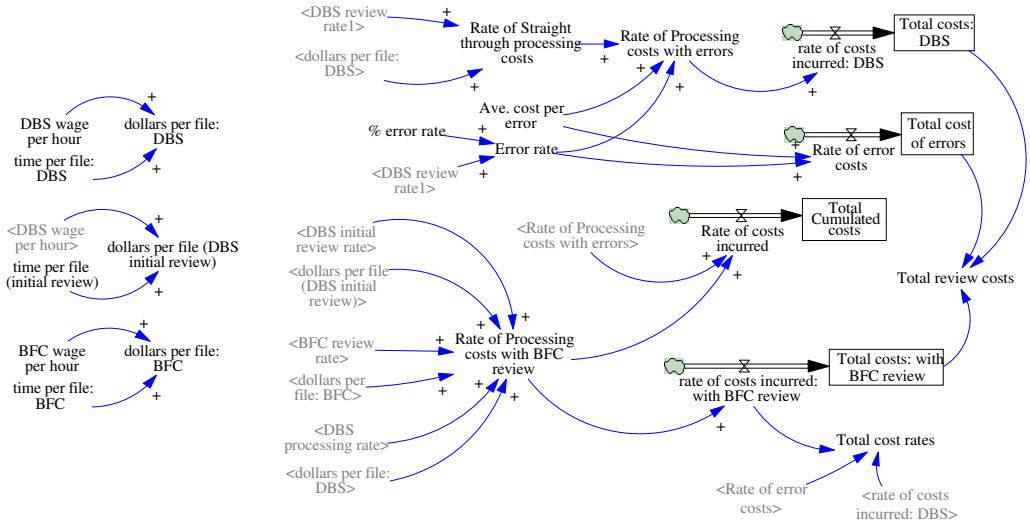

Figure 3
Cost Sector of Model

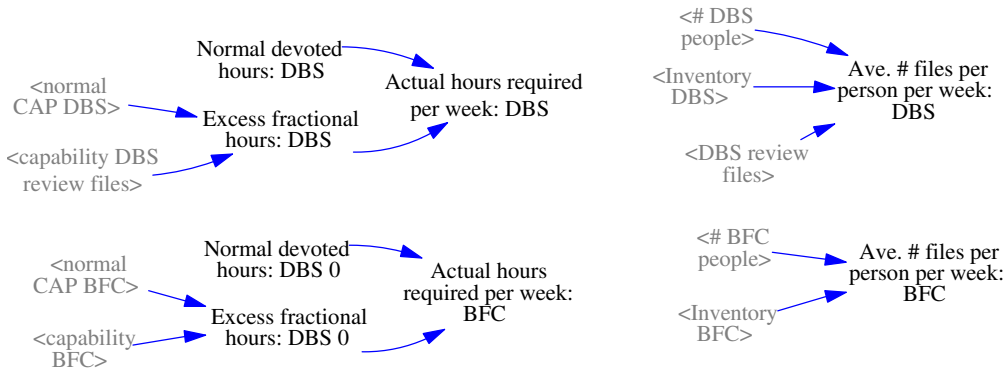

Figure 4
Sector of Model for Time Needed and Claims Productivity per Employee

Policy Tests

The base model can teach us much. Given that 66% of the the company's current claims now involve NSBMEs, it has three choices about how to allocate the time of its two kinds of claims analysts: (1) using the "normal" DBS (Disability Benefits Specialists) review process for 100% of its processing of such claims; (2) using the DBSs for most of the review but sending some fraction of the remaining claims through a supplemental review process using the BFCs (Benefits Financial Consultants); or (3) splitting the review evenly between the two kinds of analysts.

We ran tests of these three policies using the model. One test had 100% DBS review, another had 80% DBS and 20% BFC review, and the third had the review split 50/50 between the two types of analysts. Our interest in running these tests was to see how they would differentially affect costs and employee time needed, since these are the major efficiency issues confronted by the firm.

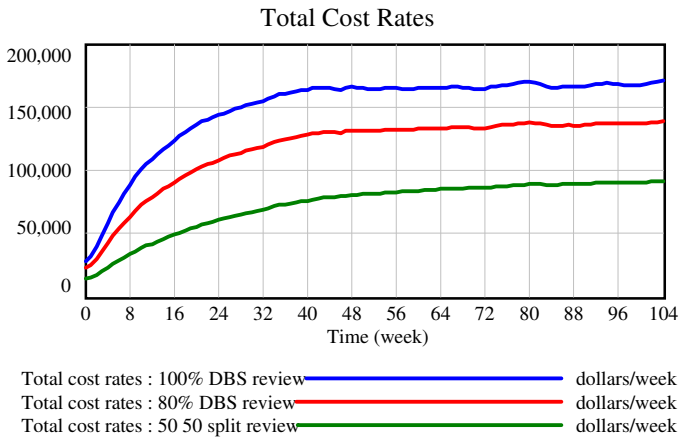

Figure 5
Weekly Costs of Tested Policies

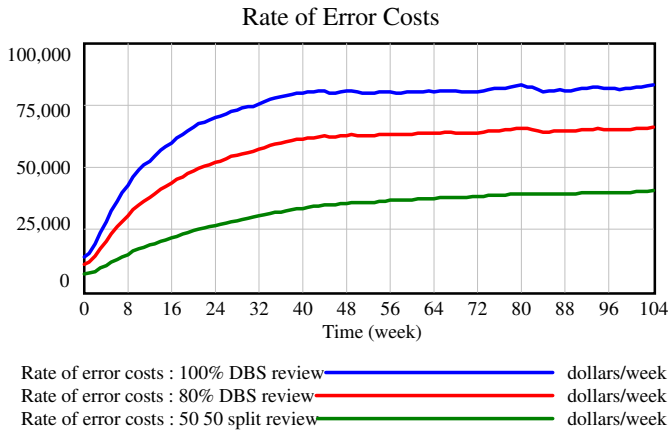

Figure 6
Weekly Error Costs Under Tested Policies

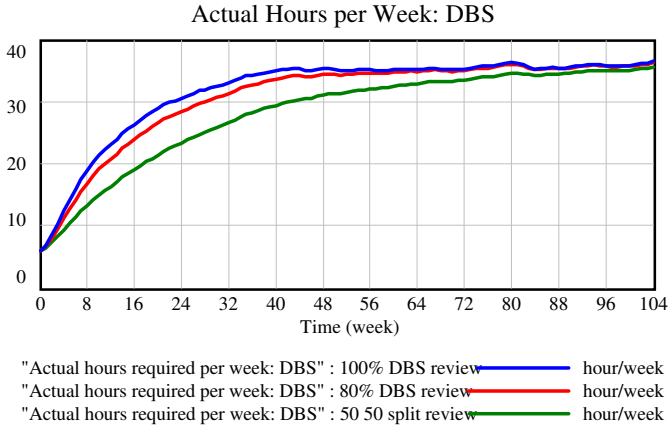

Figure 7
Hours Worked by Disability Benefits Specialists Under Policies Tested

Figure 5 shows the results for the weekly cost rates associated with the three policies. The evenly split review is clearly the best of the three policies. This is because the cost of errors, as shown in Figure 6, drops dramatically under that policy. The additional cost of the BFCs—which, using cost figures supplied by the company, is roughly $8,000 per week—is more than offset by the savings garnered—which are, using the same data, roughly $40,000 per week—from the errors detected by their deployment.

Results were similar for the productivity measures. Figure 7 shows that for most of the time the DBSs were working fewer hours on these claims under the 50/50 policy than under the other policies. However, it is interesting to note that all three policies stabilized, by the end of the two-year period of the simulation, at around 36 hours per week. This is probably the steady state reached by the system after all the efficiencies have been realized. Figure 8 shows that the DBSs spend these 36 or so hours very productively under the 50/50 policy—they are able to process close to 1,500 claims per week compared to just under 1,000 under the 100% DBS review policy. It is interesting to note that the 50/50policy is not, in the early days of its implementation, the most efficient of the three. This might discourage the firm from adopting it, and it would fall prey to the "Shifting the Burden" systems archetype (Senge, 1990).

The policy of evenly splitting the review between the DBSs and the BFCs would appear to be the highest-leverage one given the circumstance that about two-thirds of the company's policies now have Non-Standard BMEs. However, there is nothing *requiring* this proportion of NSBMEs other than the company's desire to cater to customers. Therefore, we decided to test

the effects of a potentially even higher-leverage policy—keeping the 50/50 processing split, but also reducing the proportion of NSBMEs from 66% to 33%. The results, shown in Figure 9, are that the costs savings and efficiency gains are even greater for the cut in custom BMEs than they were for the even-split review policy. Both costs and hours required are cut roughly in half by the end of the two-year simulation run. Figure 10 shows that cutting Non-Standard BMEs by half saves money even if all of the processing is done by the Disability Benefits Specialists (comparison of blue and red lines in the figure), but not as much as a policy that combines the even-split review policy with the cut in NSBMEs (green line).

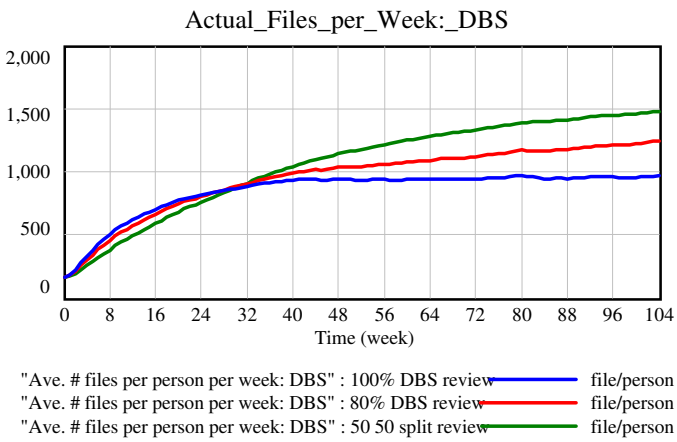

Figure 8
Files Processed per Week by Disability Benefits Specialists Under Policies Tested

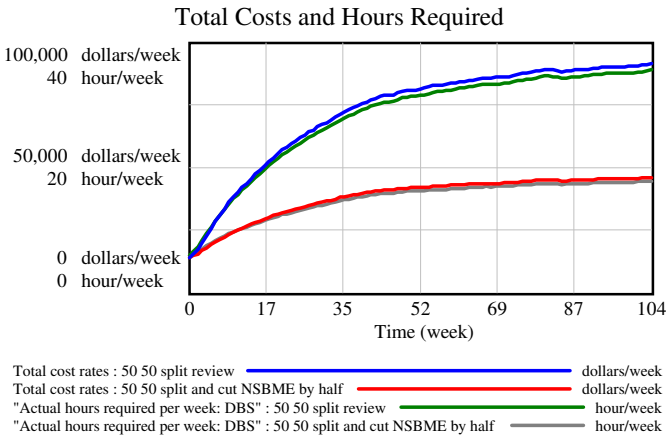

Figure 9
Comparison of 50/50 Processing Split Alone and With Cutting Non-Standard BMEs in Half for Total Costs and Hours Required

One problem with this policy test is that it is unlikely that the company would suddenly be able to cut its rate of NSBMEs in half. Accordingly, we ran one last policy test where the company's proportion of NSBMEs ramped downward (still pretty aggressively) by half over the course of a year. Figure 11 shows that this policy is effective, even with the normally expensive 100% DBS review, at substantially reducing costs. When coupled with the policy of evenly splitting the review between the DBS and BFC processors, it is even more cost-effective. Interestingly, Figure 12 shows that the actual hours that DBSs spend on NSBME claims ends up being similar for the 100% DBS and the 50/50 split policies, in the scenarios where the percentage of such claims ramps down. This might indicate that, if hours spent on claims is the imporant metric, the company might want to forgo straining the BFC part of the organization. If costs are the important metric, though, there is some benefit to using the even split approach. Also, the ultimate productivity of the DBSs is about 30% higher (Figure 13) if the even split policy is coupled with a ramping down of the percentage of NSBME claims.

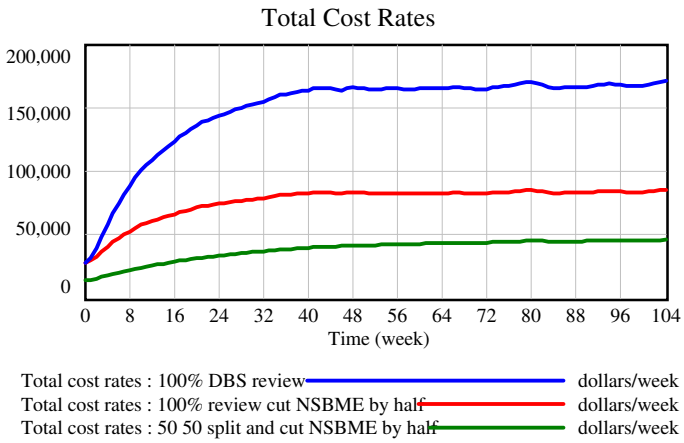

Figure 10
Comparison of Total Costs for 100% DBS Review Alone, 100% DBS Review With Cut in NSBME, and 50/50 Split with Cut in NSBME

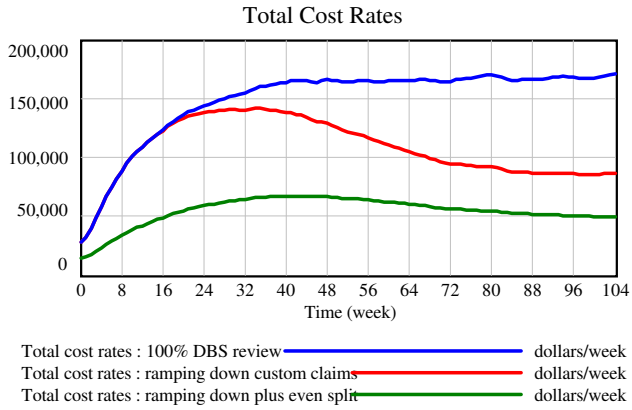

Figure 11
Cost Comparisons of 100% DBS Review (and Current Percentage of NSBMEs) with Two Other Scenarios: 100% DBS Review and 50/50 Review With Ramping Down of Percentage of NSBMEs

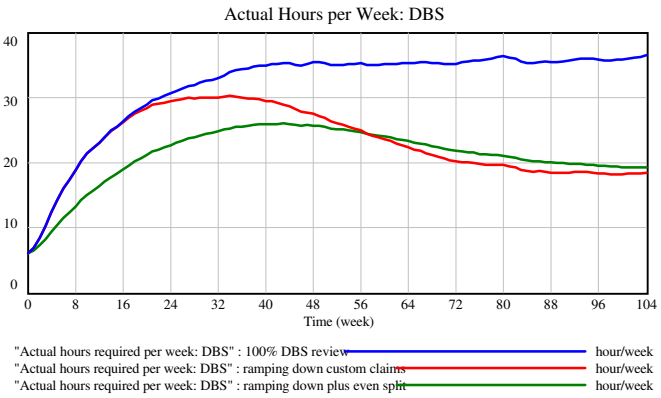

Figure 12
Actual Hours Worked Comparisons for 100% DBS Review (and Current Percentage of NSBMEs) with Two Other Scenarios: 100% DBS Review and 50/50 Review With Ramping Down of Percentage of NSBMEs

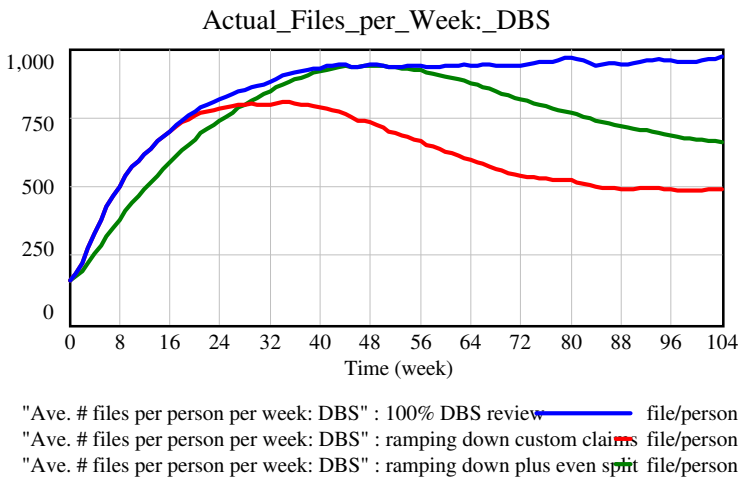

Figure 13
Actual Files per Week Comparisons for 100% DBS Review (and Current Percentage of NSBMEs) with Two Other Scenarios: 100% DBS Review and 50/50 Review With Ramping Down of Percentage of NSBMEs

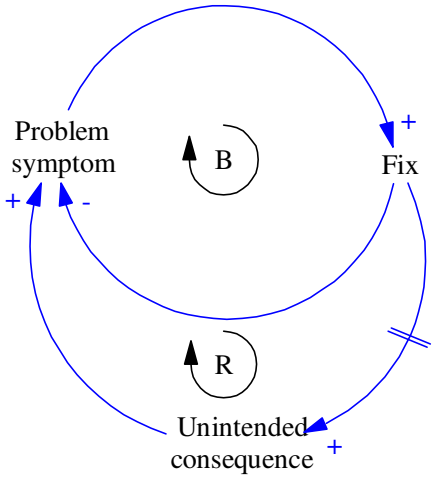

Figure 14
The "Fixes that Fail" Systems Archetype

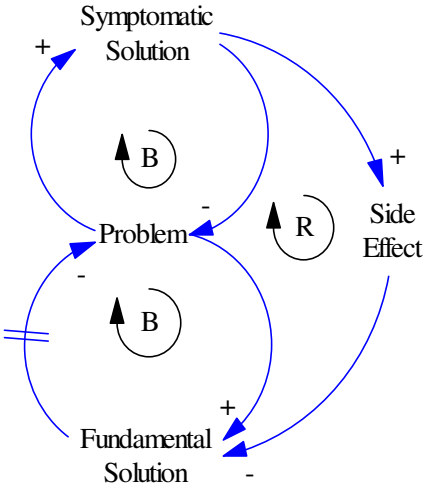

Figure 15
The "Shifting the Burden" Systems Archetype

Discussion

The policy runs show that this large disability insurance company is unwittingly in the grips of at least two systems archetypes. The first is "Fixes That Fail" (Figure 14). The fix in this instance is the NSBME, designed to garner business by appealing to customers' desire for customized policies. However, this practice generates side effects—costly errors and inefficient claims processing—that we examined in this model. Higher costs obviously result in lower profit, so the "fix" fails—even if revenue increases, the bottom line is lower. Another probable side effect, which we did not test directly in this model, is that the errors result in lower customer satisfaction and ultimately greater customer attrition. The policy runs that cut the number of

NSBMEs by half (either immediately or in a ramped fashion) showed significantly lower costs and greater processing efficiency, and presumably would have shown higher customer satisfaction. NSBMEs are a "fix" that the company would benefit from stopping.

The company also appears to be caught in the throes of the "Shifting the Burden" systems archetype (Figure 15). As shown in Figure 8, the company is faced with a situation where one of its better options—the even split policy—is less efficient early on than some of the (ultimately) less effective and efficient policies, like the 100% DBS policy. But much more important is that the company is attempting to solve its sales problem with the quick fix of the NSBME. Unfortunately, this has led to the side effects mentioned in the previous paragraph. The result is that the company feels compelled to keep using the quick fix and is loathe to suffer the pain that would come from working on the fundamental solution of enforcing the use of standard BMEs.

We therefore offer the following recommendations:

1. By far the highest leverage policy would be to reduce the percentage of Non-Standard Basic Monthly Earnings contracts. This reduces costs and improves efficiency, and probably ultimately creates higher customer satisfaction.
2. Reduction in the use of NSBMEs is worth it even if doing this would take time.
3. Whether or not the company reduces its reliance on NSBMEs, it should avoid having its DBSs be the sole processors of these claims. Shifting even part of this processing load onto the BFEs is beneficial—it reduces errors and costs and improves efficiency.
4. Apparently the optimum division of processing is an even split between the BFEs and the DBSs. This policy produces the best mix of cost savings and efficiency gains.

REFERENCE

Senge, P. (1990) *The Fifth Discipline: The Art and Practice of the Learning Organization.* New York: Currency/Doubleday.