



SOCIETY OF ACTUARIES

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Capturing the Impact of the National Economy on Humana's Claim Trends to Improve Forecast Accuracy

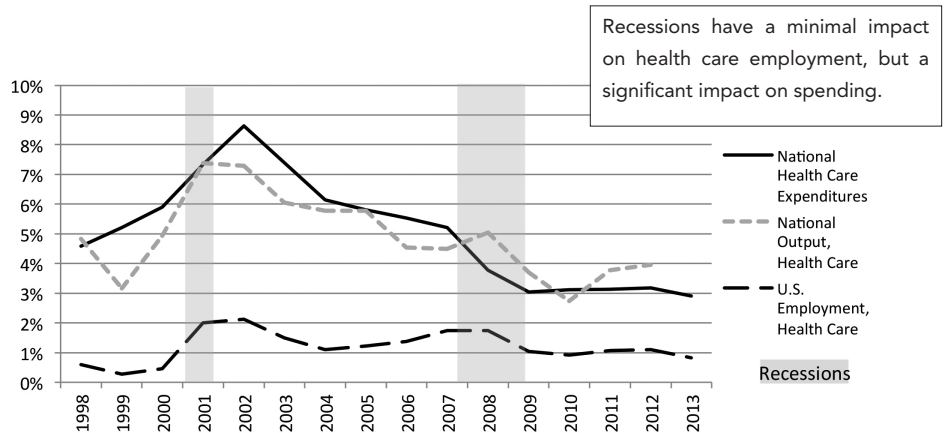
By Jen Kilgore Coriell

Five years ago, as the United States was starting to climb out of one of its worst periods of economic decline, an astute actuary made the connection between the country's economic challenges and Humana's declining claim trends. At the time, claim trends were normalized for an assortment of actuarial influences. These influences were individually quantified, and then removed from the allowed trend. But there was always a portion of the trend that was left over and could not be explained. This remainder trend presented challenges when it came time to make claim trend projections that would serve as input to setting premiums.

Humana began looking for nontraditional explanations of this remainder trend. The search intensified when it was noticed that the remainder trend had recently plummeted. Being aware of the crash in real estate values and the subsequent decline in national output (gross domestic product), Humana searched for information about the influence of the economy on claims. But, with claim trend analysis being primarily the domain of the actuarial sciences, there wasn't a lot of material available regarding the impact of the economy.

In fact, newspaper articles, journals and white papers from the mid-'90s revealed a debate over whether or not there even was a relationship between the economy and health care spending. One camp stated that patients will always demand care, regardless of their financial situation. The opposing perspective argued that there must be a relationship to their income; otherwise out-of-pocket requirements wouldn't influence the insured's demand for health care services. Another line of argument came from the evidence of steady employment in the health care sector, which showed that the industry is "recession-proof." But economists pointed to the phenomenon known as "downward stickiness" of labor markets that can typically be found in highly specialized industries where employers must make long-term commitments in order to compete for employee loyalty.

Health Care Employment, Spending and the Economy Per Capita Annual Trends



Sources: US Bureau of Labor Statistics, US Department of the Census, and CMS

The charts on page 26 provide more detail on how health care spending trends have responded to economic recessions. This pattern holds true for Medicare and private health spending, as well as hospitals, physicians and clinical providers. Another interesting pattern is that following the start of recessions, within one or two years, health care trends have typically fallen. Concurrently, recessions squeeze the federal budget due to higher outlays and lower receipts. This prompts more aggressive legislation that is aimed at trimming Medicare and Medicaid spending.

Following the atypical severity of the Great Recession, Humana actuarial management agreed that some effect was coming through to impact claim trends and it warranted further study. Actuarial staff began to develop econometric models, and a search was initiated for an economist with experience in modeling and forecasting of health care claim trends.

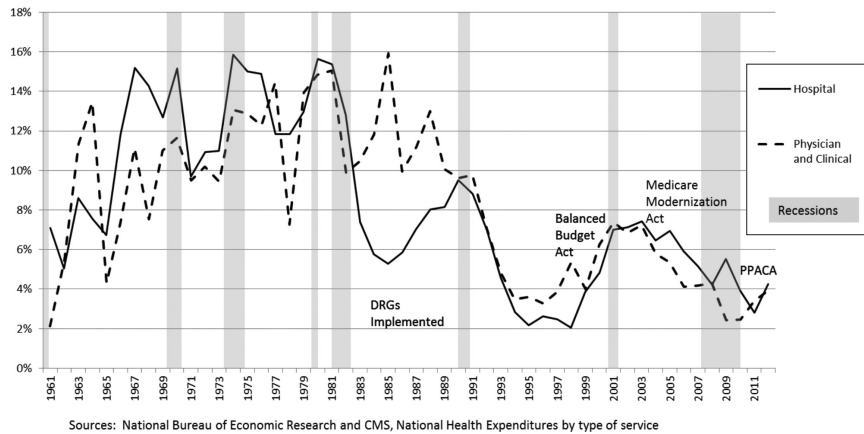
As background, in the '90s, I was with an insurer developing and deploying econometric models of claim trends. The models I developed at that time came to be relied upon for tax, strategy and market segment planning as well as investment strategy. But



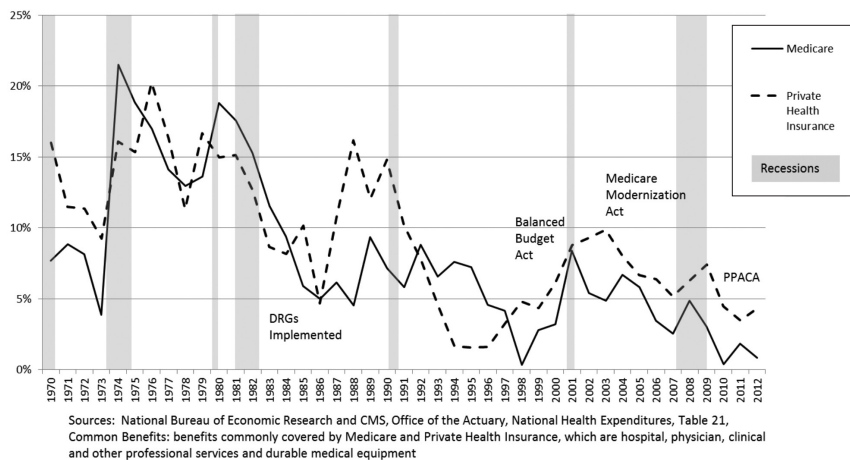
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The U.S. Economy and Health Care Spending by Service Type Per Capita Annual Trends



The U.S. Economy and Health Care Spending by Payor Per Enrollee Annual Trends



I made little progress integrating my models and forecasts into the actuarial processes. When interviewing for my current position, I was concerned that the same thing could occur at Humana and was assured by the learning culture that I saw. I joined

Humana in 2012, bringing 15 years of experience in the health care industry and 10 years of econometric modeling, four of those under a rigorous academic contract. In my two years at Humana, I've developed econometric models of claim trends for different lines of business and product categories.

I've incorporated demand- and supply-side pressures as both exert influence on the use and intensity of services. The demand measures capture the members' ability and propensity to obtain health care services. Personal income and wealth both have statistically significant relationships with claim trends.

Supply-side measures capture provider-induced demand. Most provider strategies for inducing demand for their services are somewhat slow to change, e.g., specialization. However, investments made in provider infrastructure can fluctuate quite a bit and correlate well to utilization and intensity of services provided. To capture these provider investments, I use measures of construction spending on hospitals and health care facilities. Intensity of services is influenced by the prevalence of high-tech medical equipment, which is also measured and included in the models.

My primary technical focus in this role has been to create the best forecast accuracy of claim trends. I've tested models extensively and calibrated where adjustments are persistently indicated. Forecast accuracy of the macroeconomic inputs is also critical. We purchase macroeconomic forecasts from one of the leading global economic forecasting firms. I've evaluated the accuracy of all the macroeconomic forecasts that I use and made adjustments where a consistent bias in the forecast accuracy suggests.

Because econometric modeling is not the focus of actuarial training, I have also worked to socialize the concepts and process. I have meetings once a year with management when I can describe the work that I've done and what's planned for the coming year. The actuarial managers have been engaged in the process since the portion of trend that I forecast is

a substantial part of the total allowed trend. I also provide a detailed memo with each forecast, giving updates on relevant economic news and sources of any changes to the forecast.

But have econometric models and forecasts been incorporated into the appropriate actuarial processes and used for decision-making? It's actually a tall order to ask actuarial management to rely on guidance from a field outside of their area of expertise. Making forecasts based on inferential

statistics is very different from using extrapolation and assumptions.

Bottom line: After actuarial adjustments and normalizations are applied, the claim trends that were previously unexplained are now modeled with econometric methods. The actuaries at Humana have come to rely on my econometric forecasts of claim trends for pricing and to develop consensus around corporate-level forecasts. ■



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