

# Hedging

## Financing Medicare Managed Care

Derivative swaps have been used successfully to hedge risks in the interest rate and commodities markets. Why couldn't they work in health care?

ONE OF THE FINANCIAL MARKET'S biggest success stories in the past 30 years was the development of derivatives to accurately price interest rate risks, to increase their degrees and kinds of product fits with diverse risk-bearing preferences, and to hedge them.

Central governments welcomed the economic benefits primary and secondary interest rate markets provided hedged and unhedged participants. Hedged dealers had lower transaction costs and safer portfolios, and unhedged governments had reduced borrowing costs in flexible lending environments.

These benefits weren't limited to government securities markets. Until the 1970s, thrifts and banks usually held residential mortgages until default, prepayment, or maturity. Today, homeowners have a broader choice of affordable financing options, and banks sell mortgages to secondary markets within days of origination. Why? The short answer is sales transfer undesirable prepayment and default risks to secondary markets in return for desirable originating and servicing fees that better fit bank risk preferences.

During the 1980s and '90s energy markets learned similar lessons, as did credit markets in the 1990s. Today, with a broader choice of contracting alternatives, many major energy producers and consumers of crude oil, refined products, natural gas, and others routinely hedge or contract with hedgers. For the past decade, banks and other corporations have used credit derivatives to reduce loan and receivables risks. Agriculture, metals, and other commodity markets learned those lessons, too. Now it's health care's turn, and a starting place is Medicare managed care.

### Needed: Strategic Vision

Mull over how health care financial risks might be similarly priced, fitted, and hedged, and you soon realize modern financial risk management based on derivatives will be as salu-

tary for Medicare managed care as it has been for the markets described above. This discussion features Medicare capitation, but its concepts apply to all managed care and indemnity public and private markets in general in the United States. They also apply to national health plans in developed economies and health services in developing economies in some instances.

There are three main elements of a strategic vision Medicare must adopt to successfully implement derivatives financing of managed care. It should first copy the Treasury Department's primary government debt auction mechanism; second, promote use of credit derivatives swap (cash-flow) structures to establish secondary markets; and third, encourage exchange and over-the-counter (OTC) hedging to manage financial risk with futures, options, and swaps. Just as many central governments have used derivatives to price and distribute debt, they in time will use derivatives to finance health care with equal or greater success.

The surprise is that Medicare, though not intentionally, pursued the first two of these three main requirements for first-generation derivatives financing of health care before political opposition stopped further development of competitive pricing demonstrations. The third requirement, hedging, is the easiest of the three to implement. In time, Medicare will acquire a strategic vision that integrates these three individual program initiatives into a coherent whole for the future direction for derivative financing of health care.

What are some of the key implications of health care deriv-



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# the Cure

## with Health Insurance Derivatives

atives for public and private markets?

**n Public Markets.** The Health Care Financing Administration (HCFA) could purchase capitation coverage for more Medicare beneficiaries at lower average expenditures if it took the following three steps, two of which are current initiatives to develop more “accurate” payments in more “competitive” markets.

First, it should auction one- and multi-year coverage the same way the Federal Reserve auctions bills and multi-year notes and

bonds to primary dealers who resell the debt to secondary markets. Fair auctions reveal insurers’ and providers’ expectations of reasonable reimbursements that can be hedged to reduce untoward differences between bids and actual reimbursements.

HCFA’s Medicare Competitive Pricing Demonstration, originally authorized in the 1997 Balanced Budget Act, attempted to increase competition by replacing a congressional capitation formula with budget-neutral, cost-based auction bids to determine capitation payments.

While budget-neutral, cost-based bids aren’t fair because they’re pro-buyer, not pro-competition, local political resistance arose to the demonstration projects that led to their disallowance in the 1999 Balanced Budget Refinement Act.

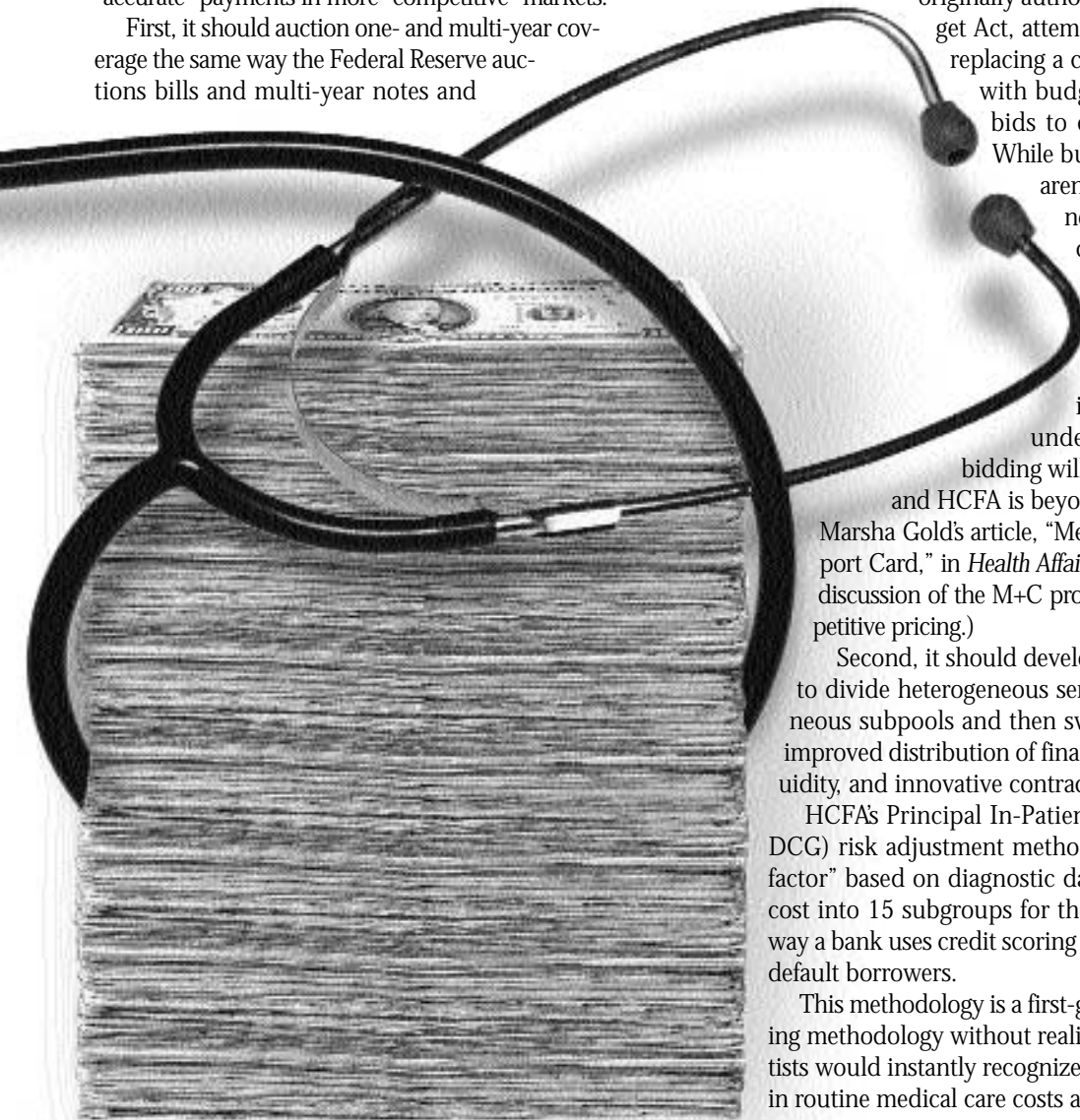
Though inevitable, in my opinion, a discussion of when and under what conditions competitive

bidding will be launched again by Congress and HCFA is beyond the scope of this article. (See Marsha Gold’s article, “Medicare + Choice: An Interim Report Card,” in *Health Affairs*, v. 20, n.#4, pp. 120-138, for a discussion of the M+C program and a brief history of competitive pricing.)

Second, it should develop new payment methodologies to divide heterogeneous service populations into homogeneous subpools and then swap payment flows. Results are improved distribution of financial risks, increased market liquidity, and innovative contracting.

HCFA’s Principal In-Patient Diagnostic Cost Group (PIP-DCG) risk adjustment methodology uses an “individual risk factor” based on diagnostic data to sort patients by expected cost into 15 subgroups for the next benefit period, the same way a bank uses credit scoring to identify likely delinquent and default borrowers.

This methodology is a first-generation credit derivative-scoring methodology without realizing it. Wall Street rocket scientists would instantly recognize unexpected, untoward changes in routine medical care costs as negative credit events that can



be financed the same way credit card debts or auto loans portfolios are financed with credit derivatives. If PIP-DCG were linked to a secondary market for resale of subpools of covered lives, the credit derivative connection would be obvious.

Third, it should promote OTC and exchange-based hedging, just as the Federal Reserve promotes interest rate derivatives hedging by primary and secondary markets. Moreover, it won't cost HCFA anything to promote hedging. Once exchanges and leading OTC firms learn HCFA is developing derivatives financing of health care, they'll rush to be first to underwrite hedging new product development. Successful hedging reduces financial uncertainty, for example, of sufficient revenue to cover provider expenses or affordable premiums for employees.

*n Private Markets.* Employers, insurers, and providers will cross-hedge demand for and supply of health services in government health insurance derivatives markets or contract with cross-hedgers. When private and public sectors financial risks aren't sufficiently correlated, new private sector derivatives markets will emerge to complement public markets. As a result, for example, health insurers may lock in profit margins from Medicare beneficiary capitation rates (output prices) that are paid to them and the provider capitation rates (input prices) they pay to suppliers. Also, e-commerce health insurance and business-to-business (B2B) reinsurance exchanges can be hedged.

To understand profit margin management more fully, consider energy markets. They have separate derivatives to hedge

crude oil and refined products (heating oil, gasoline, etc.) deals. Refineries fear higher-than-expected crude oil prices and lower-than-expected refined products prices, so they simultaneously buy crude oil futures and sell refined products futures to lock in profit margins. Referring to catalytic cracking, simultaneously buying and selling contracts is called hedging the crack or simply using crack spreads to manage profit margins.

Soybean processors similarly fear higher-than-expected soybean prices and lower-than-expected soybean meal and oil prices. Referring to crushing soybeans into meal and oil, simultaneously buying and selling contracts is called hedging the crush or simply using crush spreads to manage profit margins.

Health insurers will have similar profit management opportunities to hedge lower-than-expected patient capitation payments to them and higher-than-expected provider capitation payments to health services contractors. In the derivatives, alliterative tradition of hedging the crack and hedging the crush, health insurance derivatives management of profit margins should be called hedging the cure or simply using cure spreads to manage profit margins.

Entrepreneurs are exploring opportunities to trade health insurance and reinsurance over the Internet. A buyer advantage of platforms like ehealthinsurance.com is simple, quick comparison shopping (currently for individual, small group & Medicare supplemental). Their main financial risk management limitations, however, are the same for traditional, non-Internet health insurance markets. Sellers usually offer spot prices only for benefit periods (one year or less) to start soon (such as 90 days or fewer from the current date for ehealthinsurance.com individual coverage). These Internet and non-Internet markets are essentially short-term, spot markets. They don't usually offer deferred prices for benefit periods to be started months or more from the present and for multi-year benefit periods.

The reinsurance B2B platform inreon.com currently just offers proportional and non-proportional facultative property reinsurance in the commercial lines sector, but no health reinsurance now. Eventually, it or others will offer health coverage.

Expect platforms like ehealthinsurance.com and inreon.com to develop co-branded health contracts with commodity exchanges in the United States, Europe, and Asia. An example is the petrochemical initiative of the Chicago Mercantile Exchange and CheMatch.com, a B2B petrochemical exchange whose first product is benzene. Electronic and benzene derivatives will, like health insurance, trade simultaneously and will open the risk management door to many new product and pricing innovations.

### Setting Up the Model

Today, insurers and providers manage financial risk by self-insuring and/or by buying reinsurance. If they self-insure higher-than-expected expenses, they simply pay them when they occur or use risk pool withholding, not to be confused with risk adjustment pools, to pay the expenses. Funds are withheld from capitation payments in a risk pool to pay these expenses.

Sometimes they buy reinsurance to cover claims for catastrophic health care such as transplants or total expenses that

exceed a high per-person or aggregate threshold. Compared with self-insurance and reinsurance, hedging is far cheaper and is mainly targeted at financial management of unexpected, adverse changes in routine, not just catastrophic medical services.

Hedging is managing financial risks of small variations around the means of probability distributions of key economic performance measures that can wipe out profits and threaten solvency. It's not just about low-probability events or tails of the probability distributions of expensive, catastrophic medical events.

To set up the model of health care derivatives-financed Medicare managed care, you have to start with some basic definitions. Earned premiums (total revenue) are the sum of medical losses (ML) and administrative expenses (AE), where medical loss ratio (MLR) is ML divided by total revenue and AE includes profits. Planning for a new benefit period, a provider will price its services to cover expected ML and AE.

For example, an 85 percent ex ante MLR means expected ML are \$8,500,000 of a \$10,000,000 budget with \$1,500,000 for AE. An ex post 90 percent MLR with the same 15 percent administrative ratio equals a 1.05 or 105 percent combined ratio. This means there was a 5 percent loss due to 5 percent higher-than-expected ML (\$9,000,000 ML and unchanged AE).

These are the highlights of the ML health care derivatives financing model:

<sup>n</sup> HCFA auctions blocks of fixed-rate, capitated covered lives to financially sound insurers and providers (health primary dealers or HPDs). HPDs submit multi-year, fixed-rate bids for one, three, and five years or more.

Fixed-rate bids transfer financial risk of higher-than-expected ML from HCFA to HPDs, but the latter don't always like fixed-rate bids because their production costs can unexpectedly change, reducing profit margins. HPDs want to treat patients without financial risk, just as HCFA wants to pay for services without financial risk. What should HPDs do?

<sup>n</sup> They could sell the expected ML portion of the monthly HCFA capitation payment to specialized secondary market firms that subdivide each ML regional pool into 15 PIP-DCG subpools. The specialized firms then sell shares in the subpools to other investors. Each share is a package of, say, ML capitation payments for 100 to 1,000 covered lives.

Pension funds, mutual funds, and others trade or hold them according to risk preferences, portfolio diversification, and/or contrary expectations that ML won't increase as much as HPDs expect. Shareholders commit to pay them their ex post variable ML. Swapping an ML fixed payment for a future ML variable payment is equal to a credit derivative called total return swaps.

<sup>n</sup> HCFA establishes a central clearinghouse to record trading activity in all PIP-DCG shares. The clearinghouse uses state-of-the-art book entry, mark-to-market, margin, settlement, and other record-keeping procedures.

<sup>n</sup> HPDs receive the regular monthly HCFA capitation payment on the first of every month. On that same day they transfer, say, 85 percent of it to the clearinghouse for credit to shareholders' accounts. The clearinghouse marks to market (debits/credits) shareholder and HPD accounts by changes in the Dow Jones

Industrial Average equivalent of an MLR Index or average settlement price of the current month of an MLR futures contract during the swap period.

Whether the settlement price is greater than, less than, or equal to 85 percent, shareholders are debited and HPDs credited that amount. While a benefit period is for one or more years, swaps could be settled every day, week, month, or other interval.

<sup>n</sup> Hedging opportunities are too numerous to discuss here, but shareholders could hedge their variable ML payments with PIP-DCG futures contracts and/or cross-hedge in MLR futures contracts, among others.

Consider the consequences of not hedging. Based on the underwriting cycle and other adverse market factors, many companies have had significant losses due to unexpected MLR changes for which there are no MLR futures contracts to hedge their current period MLR. In response, they may raise prices, cut staff, and/or press suppliers to lower their prices, among other strategies. Hedging avoids or minimizes these conventional responses.

<sup>n</sup> Shareholders resell their shares any time to other investors without interrupting HPDs provision of services. With a trading life of one to several years like government securities, shares will turn over as many times as investors revise their market expectations.

#### Other Possible Consequences

International capital markets and the Federal Reserve want to find replacements for Treasuries used by secondary markets to cross-hedge and benchmark OTC spreads but diminished by federal budget surpluses and debt paydown policies. Since health markets are large, fixed payments will be paid by the government, and variable payments will have suitable payer performance guarantees, respectively, PIP-DCG shares will be very liquid and perhaps very safe.

Replacing Treasuries doesn't depend on the underlying commodity or even whatever about it that's being "priced." Given health derivatives' liquidity and safety, multi-year OTC yield curves could be cross-hedged in multi-year health derivatives markets where performance measures are strongly correlated with interest rates. Time will tell.

The key to derivatives financing of financially distressed national health plans in developed countries—and health services in developing countries—will be selecting appropriate financial performance measures of health services institutions. Then national plans in Canada, Europe, and Asia will increase their efficiency by cross-hedging in U.S. health insurance derivatives markets, unless there's too much basis risk. Then, separate but different contracts will be designed for them.

Financing health care in developing countries will probably be copied from derivatives financing of Native American health services with P.L. 93-638 federal funding because their socioeconomic, demographic, and epidemiological profiles aren't significantly different from those of developing country populations. A new approach to financing health care in developed and developing countries is now available for study. 1