Robert Connor
Douglas R. Wholey
Roger Feldman
William Riley

The Check Is in the Mail: Determinants of Claims Payable Timing among Health Maintenance Organizations

This paper used financial data from health maintenance organizations (HMOs) in the United States from the period 1985 to 2001 to examine the determinants of claims payable—the dollar amount of services rendered to enrollees but for which the HMO has not yet paid providers, such as physicians and hospitals. Claims payable management is important because delaying payments to providers can jeopardize provider operations and reduce HMO operational flexibility. The results show that HMOs manage claims payable with a multi-period perspective designed to evoke favorable responses and to avoid unfavorable ones from external parties, and to maintain flexibility for unexpected conditions. Higher HMO profitability, quicker receipt of premiums by the HMO, increased provider involvement, and greater local control of the HMO lead to faster payment to providers. Implications for HMO managers, providers, employers, and regulators are discussed.

This study investigates the determinants of claims payable management by health maintenance organizations (HMOs) in the United States from 1985 to 2001. Claims payable can be defined as the dollar amount of services rendered to HMO enrollees for which the HMO has not yet paid providers, such as physicians and hospitals. Claims payable management is important because of its broad impact. For providers, it affects how long they wait for payment. A study of 600 HMOs reported an increase in HMO claims payable from 55 days in 1994 to 71 days in 1999 (InterStudy 2000). That means providers were waiting more than two months on average to be paid. Slower claims payment also has been reported in trade journals and the popular press (Pallarito 1999; Banstetter 2001). Long payment delays jeopardize the operations of smaller physician practices and hospitals that do not have sufficient cash reserves (Banstetter 2001).

For regulators, longer HMO claims payable times are an early warning of HMO financial trouble (Christianson, Wholey, and Sanchez 1991; Coyne 1993). Regulators also examine claims payable to see whether an HMO is hiding profits through a budget sleight-of-hand (Mensah, Constantine, and Oaks 1994).

For HMO managers, good claims payable management is essential for solvency and risk management. Most aspects of HMO operations

Robert Connor, M.H.A., Ph.D., *is an associate professor in the Department of Healthcare Management, Curtis J. Carlson School of Management, University of Minnesota.* ***Douglas R. Wholey, Ph.D., M.B.A.,*** *is a professor;* ***Roger Feldman, Ph.D.,*** *is the Blue Cross Blue Shield Professor of Health Insurance; and* ***William Riley, Ph.D.,*** *is an associate professor; all in the Division of Health Services Research and Policy, School of Public Health, University of Minnesota.* *This research received support from the Robert Wood Johnson Foundation under its initiative, Changes in Health Care Financing and Organization.* *Address correspondence to Prof. Connor at Department of Healthcare Management, 3-140 Carlson School of Management, University of Minnesota, 321 19th Ave. S., Minneapolis, MN 55455. Email: conno001@umn.edu*

Inquiry 41: 70–82 (Spring 2004). © 2004 Excellus Health Plan, Inc.
0046-9580/04/4101–0070

cannot be changed quickly to respond to unexpected conditions such as higher medical utilization. For example, premiums that employers pay HMOs and prices that HMOs pay providers generally are fixed by contracts in the short run. HMOs have more short-term flexibility to change how quickly they pay providers. This flexibility reduces operating risk for HMOs.

This paper develops a conceptual framework for HMO claims payable management. Then we estimate a multivariate model of HMO claims payable, using an instrumental variable approach to control for endogeneity of key determinants of claims payable. Finally, we discuss the implications for HMO managers, providers, employers, and regulators.

HMO Claims Payable

There are two components to HMO claims payable. The first is "incurred but not reported" (IBNR) claims for services provided to enrollees for which claims have not yet been received by the HMO (Ryan and Clay 1994). Estimating IBNR can be difficult when enrollment and utilization are changing. Increasing IBNR raises accrued expenses and decreases accounting profit. Over-estimation of IBNR can lead to inflated premiums and potential loss of enrollees who might switch to a competitor; under-estimation can lead to HMO insolvency (Christianson, Wholey, and Sanchez 1991; Coyne 1993; Doray 1996). The second component is "non-IBNR claims payable" for services for which the HMO has been billed but has not yet paid providers. Paying claims quickly decreases HMO cash reserves; paying claims slowly increases cash reserves. HMO profits grow if cash reserves retained longer increase interest earned.

The average number of months between the time a service is provided and the time an HMO pays for that service is called "months in claims payable." This is calculated by dividing the year-end claims payable from the balance sheet by average claims per month from the income statement. This measure is useful for comparing claims payable management among HMOs of different size. It includes both IBNR and non-IBNR claims payable.

HMO claims payable management affects HMO management, regulators, employers and consumers, providers, and investors. Table 1 describes these effects.

Theories of HMO Claims Payable Management

Independent-Period Cash Flow Maximization

HMOs can have multiple objectives: improvement of enrollee health and quality of care, profit maximization (or maximization within a corridor), cash flow maximization (or maximization within a corridor), market dominance, or a combination of these. Cash flow occurs when an HMO receives cash or pays cash, which is usually different than when it earns revenue or records an expense. Managing cash is important because organizations can operate with accounting losses, but not without cash. Claims payable management is an important part of cash flow management. For these reasons, we use cash flow management as the theoretical basis for understanding claims payable management by HMOs.

According to corporate finance theory, organizations should maximize "net present value" (NPV) by maximizing the sum of discounted future cash flows (Brealey and Myers 1991). If HMO cash flow management in a time period did not affect future results, then HMO managers would maximize NPV by independently maximizing cash flow in each period. This would be a relatively simple model for cash flow management and is consistent with a common image of HMOs taking as long as possible to pay providers. However, reality is probably not that simple; there are lagged responses to HMO actions by external parties.

Multi-Period Cash Flow Management with Political Visibility

The dynamics among HMOs, providers, buyers, and regulators often involve multi-period contracts and lagged external responses to HMO financial performance by regulators and negotiators. Thus, a model of independent cash flow maximization in each period is inadequate to model HMOs' claims payable management. We propose a multi-period model of HMO cash flow management with lagged responses from external parties. One motivation for the multi-period model is the "political visibility hypothesis," which states that profitable firms in politically sensitive sectors use accounting methods to decrease their reported income (Mensah, Constantine, and Oaks 1994). An HMO that expects high profits which could cause negative responses by external

Table 1. HMO claims payable issues: who cares and why?

HMO claims payable issue	Actor				
	HMO managers	Regulators	Employers and consumers	Providers	Investors
Slow payment to providers by HMO can hurt providers, particularly if HMO has strong market power and providers have low cash.	*	**	**	***	*
Slow payment to providers by HMO can cause negative responses from providers, employers, and regulators—lower premiums and higher provider prices in future years.	***	*	**	*	***
Slow payment to providers by HMO during good times leaves HMO with little flexibility during lean times (premiums and provider prices are fixed by contract).	***	**	*	**	***
Quick payment to providers by HMO with low cash can lead to financial failure.	***	***	**	**	***
Underestimation of IBNR (claims that have not yet been received by an HMO) can lead to overstated profits, low cash reserves, and failure.	***	***	**	**	***
Overestimation of IBNR (claims that have not yet been received by an HMO) can cause understated profits and undue concessions (premiums too high and provider prices too low) by external parties focusing on profits.	*	***	***	***	*
Overestimation of IBNR can cause understated profits and negative responses by investors focusing on profits.	*	***	***	***	*

Notes: * = Not very important to actor; *** = very important to actor.

parties in future periods may reduce observed profits by increasing estimated IBNR. Also, an HMO that expects high cash reserves which could cause negative external responses in future periods may reduce observed cash reserves by paying providers quickly during good years.

In a multi-period model, HMOs may manage claims payable strategically by creating cooperative long-term relationships with providers. Such relationships may enable the HMO to "hide cash" by speeding up payments in good years when profits and/or reserves are high (to avoid losing cash later through regulator or buyer responses), and "retrieve cash" by slowing payments in lean years when profits and/or reserves are low. When external parties do not allow an HMO to accumulate reserves for flexibility during lean years, then this cyclical waltz of claims payable management and interest-free loans between HMOs and their providers can serve the same function. Table 2 shows the effects of changes in claims payable on cash flows from a multi-period perspective. Some effects are negative, opening the possibility of a negative relationship between HMO financial performance and claims payable.

Profit margin is a key measure of HMO financial performance that is monitored by regulators and thus is prominent in our model. Profit margin and claims payable can be endogenous. In one direction, profit margin can change claims payable. Paying providers rapidly in good years can be an investment in provider good will; in leaner times, an HMO "borrows" money at low cost from providers by extending claims payable. In the other

Table 2. Effects of changes in non-IBNR and IBNR claims payable on current and future cash

Increase in non-IBNR claims payable:	
+	Increased months in non-IBNR claims payable means delayed payment which increases HMO's current cash
−	Increased cash now may trigger responses from regulators, buyers, and providers that reduce future cash—especially if over a "ceiling" monitored by external parties
−	Delayed payment to providers may trigger responses that reduce future cash—especially if providers demand higher prices
+	Increased cash now may avoid responses from investors that would otherwise reduce future cash through higher interest on debt—especially if below "floor" monitored by investors
Increase in IBNR claims payable:	
~	No direct effect on current cash
+	Decreases current profit that may avoid responses from regulators, buyers, and providers that would otherwise reduce future cash through lower premiums or increased provider prices–especially if over profit "ceiling" monitored by external parties
−	Decreases current profit that may trigger response from investors that reduces future cash through higher interest on debt—especially if below "floor" monitored by investors

Notes: + = positive effect; ~ = uncertain effect; − = negative effect.

direction, claims payable can change profit margin. The longer an HMO takes to pay claims, the more reserves it accumulates and the more investment income it earns. Because we were interested in estimating the causal relationship from profit margin to claims payable, we used an instrumental variable methodology to control for profit margin endogeneity.

Another key financial measure that is monitored by regulators and may interact with months in claims payable is cash reserves. In one direction, cash reserves can change claims payable. Paying providers rapidly in periods of otherwise high reserves can temporarily "hide" cash from regulatory scrutiny and build provider good will. If reserves decline in later years, then delaying payments to providers may retrieve the "hidden" cash. In the other direction, claims payable can change cash reserves. The longer an HMO takes to pay claims, the more reserves it retains and accumulates. As in the case with profit margin, we used an instrumental variable methodology to control for cash reserves endogeneity. Since data on cash reserves were not available for the first four years of the panel data, the model with cash reserves was estimated as a sub-analysis.

We expect power over providers to affect claims payable. HMOs use their buying power to obtain lower prices from providers (Feldman and Wholey 2001) and they also may use this power to delay provider payments. As with profit margin and cash reserves, power over providers is likely to be endogenous. An HMO that exercises high amounts of market power over providers will be less attractive to providers, and providers will be less willing to contract with the HMO. This will decrease the HMO's power over providers. Because of the endogeneity, we used an instrumental variable approach for power over providers.

Finally, the speed with which purchasers pay their premiums is an exogenous variable that may affect claims payable. We have argued that claims payable is a way for HMOs to adjust to the ebb and flow of cash positions. As purchasers take longer to pay, an HMO can maintain cash flow management targets by delaying provider payment, lengthening claims payable. This means that the speed with which HMOs receive premium payments may affect the speed with which they pay providers. We did not use an instrumental variable approach to estimate the speed with which purchasers pay their premiums because this is largely controlled by the purchasers and not the HMO.

Methods

Empirical Model

The main study model was a multivariate regression that estimated months in claims payable as a function of HMO profit margin, HMO power over providers, HMO months in premiums receivable, other HMO characteristics, and HMO market characteristics. A sub-analysis was done

including cash reserves because cash reserves were not available for the period 1985-88.

We used an instrumental variables approach for HMO profit margin, power over providers, and cash reserves because they may be endogenous. Following earlier research, HMO enrollment as a proportion of total service area population was the primary instrument for HMO buying power over providers (Feldman and Wholey 2001). A higher proportion is expected to increase HMO buying power and has the properties required of a good instrument—it is correlated with measures for buying power over physicians and hospitals, but weakly correlated with prices and medical utilization rates. Other variables used as instruments were: federal qualification; profit status; the natural logarithm of HMO enrollment; the number of HMOs; HMO penetration; the number of HMOs times penetration; potential entry (the number of HMOs that are licensed to operate in a state and are not operating in a market); and unemployment. Federal qualification and profit status may affect consumers' perceptions of the product, which affects profit margins. The natural logarithm of enrollment captures scale economies, which affect power over providers and profit margins. HMO market structure and potential entry operate through their effect on competition among HMOs (Wholey, Feldman, and Christianson 1995). Unemployment affects HMO power relative to purchasers and providers (Maude-Griffin, Feldman, and Wholey 2002). Because state regulations requiring rate approval and consumer representation on an HMO's board may reduce an HMO's ability to negotiate lower prices, we included indicators for these regulations in the list of instruments.

Data

HMOs are the unit of analysis for this study. Five types of data were collected from HMOs in the United States from 1985 through 2001: HMO financial and utilization data; nonfinancial HMO characteristics; market area characteristics; state wage data; and state regulatory characteristics. These data have been described in previous papers (Wholey, Feldman, and Christianson 1995; Feldman, Wholey, and Christianson 1996, 1998; Wholey et al. 1996; Feldman and Wholey 2001).

Financial and utilization data came from annual reports filed with state regulators and collected by American International Healthcare (1985–1987) (American International Healthcare 1985–1988), Health Care Investment Analysts (1989–1997) (Health Care Investment Analysts 1989–1998), and InterStudy (1999–2001) (InterStudy 1999–2001). Nonfinancial HMO characteristics came from the InterStudy Census (InterStudy 1985–1987, 1988–2001), including HMO location, founding year, model type, not-for-profit status, federal qualification, national affiliation, counties where the HMO operates, and enrollment by Metropolitan Statistical Area (MSA) from 1992 through 1996 or by county after 1996. County-level market measures come from the Area Resource File (Bureau of Health Professions 1999). State-level wage data came from the Bureau of Labor Statistics (Bureau of Labor Statistics 2001a,b). State HMO regulations came from reports compiled by Aspen Publishers (Aspen Systems Corporation 1985–1994; Health Law Center 1998; Levy 1999).

For the model that did not include cash reserves, data were available for 5,528 of 8,898 (62.1%) HMO year-state observations identified through the InterStudy Censuses.[1] Missing were 1,925 (21.6%) cases because there were no matching financial data for the InterStudy Census report. There were 604 (6.8%) cases with missing data for claims payable. Months in claims payable less than zero or greater than 12 also were coded as missing. There were 470 (5.3%) cases with missing data for power over providers due to lack of data on hospital and ambulatory use. There were 16 (.18%) cases with missing profit margin data, 291 (3.3%) with missing data for premiums receivable per member month and 60 (.67%) cases with unreliable enrollment data where InterStudy and the financial files reported very different enrollments. In the final data set, 763 different HMOs appeared from one to 17 times. The average number of observations per HMO was 7.2.

We examined the pattern of missing data using probit regression, correcting for the data being clustered by HMO. Measures of HMO characteristics, HMO market structure, and indicators for each year were included in the regression. Data were more likely to be complete from larger HMOs, federally qualified HMOs, HMOs of the independent practice association (IPA) type, HMOs with higher ratios of enrollment to the population in the areas served, and HMOs offering an open-ended product. In contrast to locally

affiliated HMOs, data were less likely to be available from Blue Cross-affiliated HMOs and HMOs affiliated with national firms. Compared to 1985, data availability was significantly better from 1987 to 1993. Without correction, these results might not be equally generalizable for smaller HMOs and might underestimate the effects of financial, operating, and market factors on claims payable if these relationships were stronger for smaller HMOs. Thus, we used Heckman's two-step procedure to measure and control for selection effects (Greene 1993). The Mills ratio was significant and negative in the instrumental variable equation for profit margin, but was not significant in the instrumental variable equations for power over providers or cash reserves (in the sub-analysis) or in the equation for claims payable months. With selection correction, the results were generalizable for all factors related to completeness of the data.

Since HMOs operate over a number of geographic markets, we used a two-step procedure to aggregate market-level measures to the HMO level. First, we used hospital service areas (HSAs), and then we constructed weighted averages of the market measures for all HSAs where an HMO operated. HSAs are based on a clustering algorithm created by Makuc et al. (1991) that minimized geopolitical border crossing for hospital admissions. They grouped counties in the contiguous United States into approximately 800 HSAs. HSAs are an improvement over using MSAs or counties as market areas because they take into account the patterns by which individuals consume health care. HSA-level measures were constructed as weighted averages of all counties in the HSA, with the weights being the proportions of the HSA's total HMO enrollment in each county. County data were aggregated into HSAs using a crosswalk between counties and HSAs.

The second step of measuring market characteristics at the HMO level took account of the fact that most HMOs operate in several HSAs. Market characteristics at the HMO level were constructed as weighted averages of market measures for all HSAs where an HMO operated. The weights used are the proportions of an HMO's total enrollment in each HSA.

To construct HMO market characteristics, we obtained data from InterStudy and the Group Health Association of America (GHAA) (GHAA 1989–1992) on the markets served by HMOs and HMO enrollment in those markets (Baker, McGee, and Shadle 1984; Hartwell et al. 1986). This information was linked to HSAs in a two-step process that involved prorating HMO enrollment to counties and then aggregating the county-level data back to HSAs. Three sources of information were used to prorate enrollment: a) a list of the counties served by each HMO in each year, which were available for 1989 to 1992 from GHAA and for 1985 to 1987[2] and 1992 to 1998 from InterStudy; b) enrollment by MSA served, available for 1992 through 1998 from InterStudy; and c) county-level enrollment, available for 1997 to 2001 from InterStudy. Our procedure was to use the most accurate of the three sources. First, county enrollment was used if it was provided. Then, an HMO's reported MSA enrollment was prorated to the MSA's constituent counties. Finally, enrollment that was not allocated by the prior two steps was prorated over all the remaining counties that the HMO served. All prorating was based on county population weights (e.g., an HMO operating in two counties with populations of 100,000 and 200,000 would have one-third of its reported enrollment allocated to the smaller county and two-thirds to the larger county).

Measures

Claims payable months was measured as the amount in claims payable on the balance sheet divided by one-twelfth the sum of physician expenses, other provider expenses, emergency room and outside-area expenses, referral expenses, and inpatient expenses. Profit margin was measured as net income after taxes and extraordinary items, divided by total revenue. We measured cash reserves as the sum of short-term assets, restricted assets, and long-term assets—per member per month, standardized to 1982-1984 price levels.

HMO power over providers was constructed using principal components, combining measures of HMO buying power for hospital services and HMO buying power for physicians' services (Feldman and Wholey 2001). HMO buying power for hospitals was measured by hospital days purchased by the HMO divided by days purchased by all payers in the HMO's market area. HMO buying power for physician services was

measured by ambulatory visits purchased by the HMO per 1,000 active physicians in its market.[3]

Premiums receivable months was measured as the premiums receivable amount on the balance sheet divided by one-twelfth of total commercial, Medicare, and Medicaid premium revenue on the income statement.

Other HMO characteristics that may affect months in claims payable are HMO model type, for-profit status, age, and payer mix. Physicians in HMOs that contract with medical groups (group, staff, network, and mixed model HMOs) draw a greater proportion of their patients from the HMO than do physicians in IPA-type HMOs, which contract mainly with physicians in solo or very small group practices (Wholey and Burns 1993). This results in HMOs and physicians being more interdependent in non-IPA type HMOs. Greater interdependency may cause differences in provider payment rates. We included dummy variables in the model for group, staff, network, and mixed-model HMOs relative to the omitted category of independent practice associations. HMOs less than two years old generally have different operating characteristics (Feldman, Wholey, and Christianson 1996) and younger insurers generally are less accurate in estimating IBNR (Aiuppa and Trieschman 1987), so we included dummy variables for HMOs less than two years old and for HMOs two to four years old. We also included the proportions of an HMO's enrollment from Medicare and Medicaid.[4]

Wage rates from the Bureau of Labor Statistics occupational wage surveys and average charges for a physician office visit and a hospital day were included in the regression to control for market characteristics that might be related to input prices. HSA-level measures for the average charges for a physician visit and a hospital day were constructed by averaging prices for all HMOs operating in an HSA.

Other variables included in the model were indicators for year relative to 1985, income per capita, community hospital days per 1,000 population, and indicators of state HMO regulations (from Aspen Systems) such as consumer representation in governance, rate approval, reserve requirements, and grievance policies. Income was aggregated in a weighted average from counties to HSA (using county population as weights) and HSA hospital days were obtained per 1,000 HSA population; then income and days were aggregated in a weighted average from HSAs to HMO (using HMO enrollment by HSA as weights).

Instrumental Variables

The instruments performed well. In the equation for power over providers, the significant instruments were the HMO's proportion of total service area population ($\beta = 3.19$; $T = 20.96$), HMO penetration ($\beta = 3.38$; $T = 11.72$), the interaction of the number of HMOs and penetration ($\beta = -.08$, $T = -2.97$), unemployment ($\beta = .02$, $T = 2.51$), and rate approval required ($\beta = .19$, $T = 3.19$). The significant instruments in the equation for profit margin were the HMO's proportion of total service area population ($\beta = -66.35$, $T = -11.79$), federal qualification ($\beta = -10.26$, $T = -5.34$), potential entry ($\beta = .55$, $T = 5.14$), number of competing HMOs ($\beta = -.63$, $T = -2.91$), the interaction of the number of HMOs and penetration ($\beta = 2.16$, $T = 2.00$),and rate approval required ($\beta = 5.80$, $T = 2.56$). When the sub-analysis including cash reserves was estimated, the significant instruments for cash reserves were the HMO's proportion of total service area population ($\beta = 19.18$, $T = 4.69$), the natural logarithm of the HMO's total enrollment ($\beta = -4.52$, $T = -5.33$), the number of competing HMOs ($\beta = .43$, $T = 2.69$), and rate approval required ($\beta = -5.05$, $T = -2.94$).

The pooled panel data initially resulted in an unbalanced design with HMOs appearing from one to 17 times so errors might not be independent and autocorrelation might be present. The unbalanced design and non-independence of errors were addressed with a random effects estimator.[5]

Results

Figure 1 shows the mean number of months and 95% confidence intervals in claims payable during the study period for IPA and non-IPA-type HMOs. The average number of months is very consistent with reports that payments were taking 71 days in 1999 (InterStudy 2000). IPA-type HMOs consistently have a greater number of months in claims payable than do non-IPA HMOs.

Table 3 presents the results of the main model of claims payable. There is a significant negative relationship between profit margin and months in claims payable. This supports a multi-period theory of cash-flow management and application of the "political visibility hypothesis" to HMOs. It

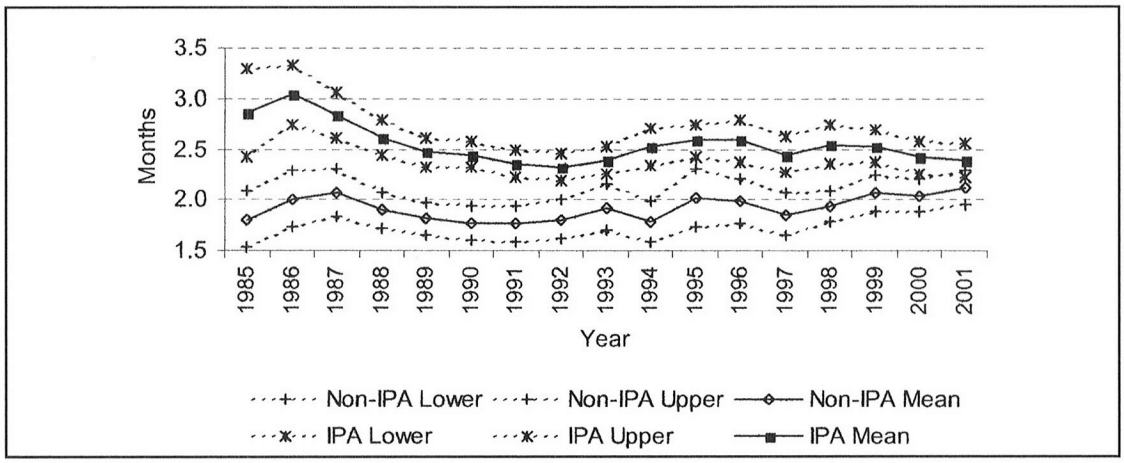

Figure 1. Number of claims payable months by year and HMO type (means and 95% confidence intervals)

suggests adjustment of non-IBNR claims payable and is consistent with HMOs paying providers more quickly during good years and more slowly during lean years. This explanation depends on a long-term relationship between HMOs and their provider networks, which is also supported by a finding of longer payment times among younger HMOs discussed subsequently. Competitive economic agents often must interact repeatedly before they realize the potential advantages of cooperative behavior. In this context, younger HMOs may not yet have realized the long-term cooperative advantages of paying providers more quickly during good years.

The effect of power over providers is insignificant, but the unexpected negative sign still merits comment. We explored this finding by estimating a model that added an interaction of power over providers and profit margin. In this model, power over providers had an insignificant positive effect, profit margin had a significant negative effect, and the interaction of power over providers and profit margin had a significant negative effect. The significant negative effect of the interaction can be interpreted either as reinforcing the political visibility argument, with dominant HMOs being more visible, or as supporting a "physician capture" argument, with HMOs having a lot of power over providers but also being highly dependent on them.

The effect of premiums receivable on claims payable is positive and significant. For example, a two-week increase in the lag time of premium payments to an HMO generally causes a one-week increase in lag time of HMO payments to providers. The extent to which an HMO "passes along" lags in payment may be analogous to the extent to which firms "pass along" the cost of taxes to their vendors or customers.

The results show that group, staff, network and mixed-model HMOs pay claims faster than IPAs. Group model HMOs pay claims nearly a full month faster. In contrast to nationally affiliated and Blue Cross HMOs, locally affiliated HMOs have fewer months in claims payable. These results with respect to HMO model and local control suggest that close relationships between HMOs and providers lead to faster payments to providers. There is no difference in months in claims payable between for-profit and not-for-profit HMOs.

HMOs in operation less than two years do not pay significantly faster or slower than more mature HMOs, but HMOs in operation between two and four years pay more slowly. This may reflect the interaction of two effects. First, younger HMOs may have higher months in claims payable due to: less-efficient claims payment processes; higher IBNR estimates due to rapid growth and uncertainty; and fewer well-established cooperative relationships with their providers. The cooperative HMO-provider cycle of faster payment during good years and slower payment during lean years may take time to evolve. Second, HMOs just starting out may pay providers very quickly to attract a panel, yet HMOs that pay too quickly at first may go out of business before year two. These two effects may combine causing HMOs age two to four to have the highest months

Table 3. Means, standard deviations (SDs) and instrumental variable regression of determinants of months in claims payable

Variable	Mean	SD	Estimate	*T*-statistic
Dependent variable: months in claims payable	2.226	1.218		
Instrumental variables				
Power over providers[a]	−.002	.946	−.048	−.890
Profit margin	−5.131	26.509	−.018*	−6.790
Months in premiums receivable	.474	.476	.370*	9.830
HMO characteristics				
Group type HMO	.065	.246	−.522*	−4.750
Staff type HMO	.060	.237	−.423*	−4.610
Network type HMO	.118	.323	−.181*	−2.730
Mixed type HMO	.158	.365	−.225*	−4.190
For-profit	.700	.458	.083	1.270
Affiliated with national firm	.142	.349	.152*	1.970
Affiliated with Blue Cross	.463	.499	.152*	3.050
Less than 2 years old	.088	.283	.159*	2.250
2 to 4 years old	.132	.339	.134*	2.690
Offers open-ended product	.332	.471	.055	1.140
Proportion of total enrollment due to Medicare	.040	.083	−.442	−1.730
Proportion of total enrollment due to Medicaid	.058	.163	.498*	3.860
Community characteristics				
Provider supply[b]	.021	.991	.008	.180
Provider income[c]	−.022	.977	−.202*	−3.870
Income per capita	21.906	5.837	.023	2.490
Hospital days per thousand in community	887.791	275.720	.000	−.010
Capitalization and reserve regulations present	1.720	.671	−.010	−.210
State does not have specific HMO regulation	.087	.282	−.120	−1.230
Year				
1985 (contrast)	.029	.167		
1986	.047	.212	−.036	−.350
1987	.065	.246	.149	1.420
1988	.070	.256	.072	.670
1989	.073	.261	.243*	2.150
1990	.070	.255	.379*	3.270
1991	.063	.243	.372*	3.160
1992	.062	.241	.400*	3.210
1993	.058	.235	.475*	3.620
1994	.056	.230	.488*	3.450
1995	.058	.234	.338*	2.250
1996	.061	.239	.281	1.780
1997	.060	.238	.256	1.530
1998	.066	.248	.260	1.540
1999	.060	.237	.499*	2.630
2000	.056	.229	.517*	2.560
2001	.046	.211	.507*	2.450
Mills ratio			.072	.310
Intercept			1.081*	4.110
Instruments				
Log of enrollment	1.334	1.492		
Federally qualified	.532	.499		
Share of population	.081	.109		
Number of HMOs	9.220	4.670		
Penetration	.186	.096		
Number of HMOs * Penetration	1.876	1.488		
Potential entry	9.650	7.496		
Unemployment rate	5.332	1.746		

Table 3. (continued)

Variable	Mean	SD	Estimate	*T*-statistic
Rate approval required	.784	.411		
Consumer representation on board required	.276	.447		

[a] First principal component constructed from measures for HMO buying power over hospitals and physicians, 90% of the variance explained.
[b] First principal component constructed from beds and physicians per capita, 50% of variance explained.
[c] First principal component constructed from inpatient per diem, physician charge per ambulatory visit, hourly wage for nurses and secretaries, 70% of variance explained.
Model F(38,5490)= 20.20 ($p < .01$).
* $p < .05$.

in claims payable. These HMOs are old enough to have survived the fast-paying initial years, but have not yet established long-term cooperative relationships with providers.

The indicator variables for the years 1986 through 2001 compared to 1985 show an increase in months in claims payable of about one-fourth month (joint test that all year effects are equal to zero is rejected, $F = 2.62$, $p < .05$). The increase is also consistent with an earlier finding by InterStudy that the median number of days in HMO claims payable grew from 55 in 1994 to 71 in 1999 (InterStudy 2000), and anecdotal reports in the trade press (Pallarito 1999; Banstetter 2001). The pattern of year effects also suggests cyclicality, with claims being paid faster in 1985 through 1988, and 1997 and 1998.[6] These periods followed low points in profit margins. This is consistent with HMOs paying providers faster after increasing premiums to address severe profitability problems.

Since data for cash were unavailable for 1985 through 1988, we did not include cash in the presented results, but we did conduct a sub-analysis on the limited sample including cash reserves. The effects of profit margin were marginally weakened (the *t*-statistic for profit margin decreased to −1.82). The association between cash reserves and claims payable was negative but not significant ($\beta = -.03$, $T = -1.08$). The weakening of the profit margin effect could be due to excluding four years of data or the collinearity between cash reserves and claims payable caused by their accounting relationship (increasing cash reserves or decreasing claims payable are substitutable uses of revenue).

Discussion

Multi-Period Theory Supported

The results show that HMOs do not just maximize single-period cash flows or always take as long as possible to pay providers. HMO management of claims payable involves a multi-period perspective, with HMOs using claims payable to manage potential responses from external parties and to maintain operational flexibility to deal with unexpected conditions. These strategies depend on long-term HMO-provider relationships and are influenced by physician involvement.

Power over Providers and Claims Payable

The lack of an observed direct effect of HMO power over providers on claims payable is surprising. One would think that an HMO with more power over providers would pay providers more slowly. However, there may be indirect effects of power on claims payable operating through HMO profit margin, and/or a trade-off between provider payment levels and promptness. It has been documented that greater HMO power over providers results in lower payment for providers (Feldman and Wholey 2001). Lower payments increase the HMO's profit, which reduces claims payable. The indirect effect working through profit margin may dominate any direct effect of power on claims payable in our model. There may also be a trade-off in providers' willingness to accept lower payments, versus payment delays in response to HMO power. Providers may accept lower payment rates or longer delays, but not both equally. These reasons could explain the lack of an observed direct effect of HMO power over providers on claims payable.

Premiums Receivable Affect Claims Payable

The results show that the speed with which HMOs receive premium payments from employers affects the speed with which they pay providers. On average, a two-week increase in lag time to receive premiums causes a one-week increase in lag time to pay providers. This suggests that HMOs manage inflows and outflows together, and that HMO claims payable trends should be viewed in the context of the entire health financing sequence.

Long-Term Relationships between an HMO and Providers

The results show that the degree of provider involvement and local control affect the speed of payment to providers. Group-model HMOs pay providers almost a full month sooner than IPAs. Local control also is associated with faster payment. The relationship between profit and claims payable also has implications for providers. HMOs that pay slowly during lean years and quickly during good years are acting rationally. HMOs that pay slowly during good years may be in, or headed toward, risky financial condition.

Implications for HMO Managers

The importance of claims payable management is not new to HMO managers, but this study sheds light on national trends and industry practice. The speed of employer premium payments to HMOs affects the speed of HMO payments to providers. This evidence may be useful when HMOs negotiate with employers about the timing of premium payments. This study also shows that HMO managers should develop long-term cooperative relationships with their provider networks involving "give and take" on the level and speed of provider payments. HMO managers should resist myopic, short-term cash flow maximization that results in adverse responses from regulators and providers for years to come. Paying providers more quickly (particularly during profitable years) can generate good will that increases future cash flows as well as financial flexibility for difficult years in the future. Providers also may be willing to accept lower payment rates in return for quicker payment. Multiyear, rolling-average standards for the speed of claims payment in HMO-provider contracts could benefit both HMOs and providers—giving HMOs operational flexibility and giving providers standards for prompt payment. HMOs will face increasing challenges with respect to payment speed from "consumer directed health plans" (CDHPs) that pay providers immediately. HMOs should prepare to negotiate payment speed in response to such competition and even consider offering such accounts themselves.

Implications for Providers

HMOs with greater provider involvement and local control tend to pay providers faster. Providers should consider this when contracting with different health plans and when opportunities arise to participate in health plan governance. Providers negotiating with an HMO should emphasize that it also can be in the HMO's best interest to pay providers relatively quickly—especially during good years. This can generate external good will for the HMO by providers and regulators. It also can give the HMO cash flow flexibility when difficult years come. HMOs generally are taking longer to pay claims, currently an average of more than two months. Providers who face unreasonable payment delays and little ability to negotiate with a large HMO may wish to consider participating in one of the new consumer directed health plans that pay providers immediately.

Implications for Employers

Employers making coverage decisions should consider how quickly an insurer pays providers. Metrics for speed of claims payment should be included in their coverage contract. If an employer has few plans to choose from and plan payment lags are unsatisfactory, then the employer may wish to consider health account arrangements in which providers receive payment immediately. Employers also should realize that how quickly they pay the HMO affects how quickly the HMO pays providers.

Implications for Regulators

HMO regulators can be compared to chefs. Chefs periodically taste a dish to see whether it has too little or too much of the key ingredients. HMO regulators periodically measure HMO financial indicators to see whether financial profitability and reserves are too low (potential for future bankruptcy) or too high (potential abuse of market power). This study

shows that months in claims payable is an important indicator to monitor. Consistently long lags in claims payment can be an early warning signal of financial trouble—even when an HMO is currently profitable. HMOs that always take a long time to pay claims may lack the financial flexibility to deal with difficult years in the future. HMOs that speed up their payments to provider networks during profitable years may be financially better off than one would think by looking at their profitability and cash reserves alone. Also, HMO profit margin often is adjusted by changes in the way IBNR claims payable is estimated. This is another reason why profit margin should not be considered in isolation from months in claims payable.

Recommendations for Further Investigation

Given the importance of HMO claims payable for both HMOs and the health care system as a whole, additional investigation is warranted. Questions for future research include: What patterns of reserves and claims payable will predict HMO failure? Do the effects of payment delay on providers' financial health differ by type of provider? What are the pros and cons of provider-dominated HMOs with quicker payment times? Can providers negotiate price increases with HMOs in return for multi-year flexibility in claims payable standards? Are providers willing to accept lower prices for quicker payment, with the extreme version of quick payment being consumer directed health plans?

Notes

1 The number of HMOs differs from raw InterStudy counts because InterStudy sometimes has multiple reports for an HMO by geographic area within a state. Since financial results are reported at the state level, the InterStudy census reports are aggregated to the state level.

2 From 1985 to 1987, the vector of counties that each HMO operated in was constructed from InterStudy HMO Censuses, which showed the MSA where each HMO was headquartered, and from a series of reports by InterStudy on MSAs where each HMO operated (Hartwell et al. 1986). Each HMO was coded as serving all counties in the MSAs where it was reported. The availability of an explicit listing of counties where each HMO operated in 1988 resulted in a significant increase in counties with operating HMOS between 1987 and 1988.

3 Since HMOs are less likely to report ambulatory use than hospital use, and since the correlation between power over providers for ambulatory use and hospital use was .78, ambulatory power over physicians was imputed using Stata's impute command to avoid losing cases. Ambulatory power was imputed in 797 of the cases used in the analysis.

4 The random effects estimator was complemented with Stata's XTIVREG. To avoid losing cases, the proportion of enrollment from Medicaid was imputed in nine cases. The proportion of enrollment from Medicare was imputed in seven cases.

5 The random effects estimator was implemented with Stata's XTIVREG. We also estimated the models with fixed effects and the inferences were similar.

6 Average profit margins by year from 1985 to 2001 are: −14.89 (1985), −27.50 (1986), −21.92 (1987), −12.03 (1988), −2.95 (1989), 1.46 (1990), 1.32 (1991), 2.03 (1992), .67 (1993), 1.90 (1994), −5.62 (1995), −5.11 (1996), −5.47 (1997), −5.52 (1998), −3.02 (1999), −1.62 (2000), −.75 (2001). Very low profit margins in the mid-1980s were due to a large number of HMO start-ups (Wholey Christianson, and Sanchez 1993), which have high expenses relative to revenues. The HMO age indicator variables capture the effect of start-ups on claims payable.

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