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Health plan pricing behaviour and managed competition

Rudy Douven, Erik Schut

Erik Schut is affiliated with the Department of Health, Policy and Management (iBMG) at the Erasmus University Rotterdam. The responsibility for the contents of this CPB Discussion Paper remains with the author(s). CVZ is gratefully acknowledged for providing most of the data for this study.

CPB Netherlands Bureau for Economic Policy Analysis
Van Stolkweg 14
P.O. Box 80510
2508 GM The Hague, the Netherlands

Telephone +31 70 338 33 80
Telefax +31 70 338 33 50
Internet www.cpb.nl

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Abstract in English

In the Dutch social health insurance scheme, health plans operate in a managed competition framework. Essential features of this framework are risk adjustment, open enrolment and community rating. The objective is to study how health plans determine their community rated premiums. Using a panel data set for all health plans operating in the Dutch social health insurance market over the period 1996-2004, we estimate a premium model to determine which factors explain the price setting behaviour of health plans. Our empirical results indicate that competition did not play a major role in premium setting by health plans. We find that financial stability rather than profit maximisation offers the best explanation for health plan pricing behaviour. The forecast of next year's health-care expenditure by the government and the adjusted forecast by the insurers' association play a major role in health plans' pricing decisions. The introduction of a national health insurance scheme in 2006 urged all citizens to reconsider their health plan choice. The threat of losing customers had a profound impact on health plans' pricing behaviour. In sharp contrast to the period 1996-2005, in 2006 competition seems to play a dominant role in insurers' pricing decisions. Whether this will be a temporary or a lasting phenomenon is hard to predict.

Key words: Managed competition, Community rating, Health insurance, Health-plan choice
JEL code: I11, I18, L11, D41

Abstract in Dutch

Sinds 1996 bestaat er voor verzekeraars een systeem van gereguleerde concurrentie op de ziekenfondsmarkt. Voor de periode 1996-2004 wordt op basis van paneldata op ziekenfondsniveau onderzocht hoe de premiestelling van ziekenfondsen kan worden verklaard. Uit de schattingen volgt dat concurrentie een ondergeschikte rol speelde bij de premiestelling door ziekenfondsen. Het prijszettinggedrag van ziekenfondsen lijkt veel meer te worden beïnvloed door het streven naar een gezonde financiële positie dan door winstmaximalisatie. De voorspelling van de totale zorguitgaven door de overheid, en de aanpassing van die voorspelling door Zorgverzekeraars Nederland (ZN), lijken een belangrijke rol te spelen in de premiestelling van individuele ziekenfondsen. De invoering van de Zorgverzekeringswet in 2006 heeft geleid tot een radicaal verschillende keuzesituatie voor alle verzekerden. De reële dreiging van een verlies aan verzekerden blijkt van grote invloed op de premiestelling van zorgverzekeraars. In scherp contrast met de periode 1996-2005, lijkt concurrentie een dominante rol te spelen bij de premiestelling. Of dit een tijdelijk of blijvend fenomeen is, valt nog moeilijk te voorspellen.

Steekwoorden: Gereguleerde Concurrentie, Nominale Premies, Zorgverzekeringen.

Contents

Summary

In the Dutch social health insurance scheme, health plans operate in a managed competition framework. Essential features of this framework are risk adjustment, open enrolment and community rating. An important condition for managed competition is that price competition sufficiently motivates health plans to improve the efficiency of health care. The purpose of this paper is to study whether the precondition of sufficient price competition is met.

Previous studies provide evidence that competition is likely to be weak because of low price sensitivity of consumers. If competition would not be sufficient to drive premiums down to the competitive level, the question becomes how health plans determine the community rated premiums. For example, do they raise premiums to increase profits or do they charge premiums that are just sufficient to cover average cost?

We studied health plans' pricing behaviour by constructing a panel data set including information on health insurer characteristics, premium levels and financial performance for all health plans operating in the Dutch social insurance market over the period 1996-2004. Using these panel data, we estimate a premium model to determine which factors explain the price setting behaviour of health plans.

Our empirical results indicate that competition did not play a major role in premium setting by health plans. Despite the lack of effective competition, premiums did not converge towards the monopoly level. Instead, we observe a substantial and persistent premium variation, while in most years the average premium is only somewhat higher than the "administrative premium" as yearly set by the government. The administrative premium is about the break-even price for an average health plan if the government's forecast of total health care and administrative expenditures is correct. The most important drivers for health plans' pricing behaviour appeared to be the legally specified minimum and maximum levels of financial reserves. The forecasts of next year's health care expenditure by the government, and the adjustment of this forecast by the insurers' association, play a major role in health plans' pricing decisions.

In 2006, all Dutch citizens were faced with a radical change in choice setting due to a major reform of the health insurance system. Health insurers anticipated that many customers would reconsider their health plan choice. The threat of a substantial loss of customers had a profound impact on health plans' pricing behaviour. Most health plans charged substantially lower premiums than forecasted by the government. Next to increased competition, this pricing behaviour may also be explained by the government's assurance that in 2006 insurers would be largely compensated if risk-adjusted payments would be insufficient to cover actual costs. This implied that the premium forecast by the government – which is used to determine the total amount of risk-adjusted payments – could serve as a reliable benchmark for setting premiums. In sharp contrast to the period 1996-2005, however, competition seems to play a dominant role in pricing decisions by health insurers in 2006. Whether this will be a temporary or lasting phenomenon is hard to predict.

1 Introduction

During the 1990s, the social health insurance scheme of the Netherlands was profoundly reformed by the introduction of managed competition among non-profit social health plans (sickness funds, health insurers or health insurance carriers).[1] Health plans were allowed to compete on price for a legally standardised basic benefits package. To preserve risk solidarity, health plans were obliged to charge a community rated premium. A system of risk-adjusted premium subsidies was introduced to compensate health insurers for enrolees with predictable high medical expenses. Freedom of choice of health plans was introduced by requiring health plans to accept all eligible applicants during annual open enrolment periods. Furthermore, the legal entry barriers to the social health plan market were largely removed and several new health plans were permitted to enter the market. Finally, to provide health plans with the opportunity to manage care in 1992 the government abolished the obligation for health plans to contract with any willing provider, except for inpatient care institutions. In 2006 the scope of managed competition model was broadened from about two thirds to the entire population by the introduction of a new Health Insurance Act. Since then former social health plans and former private indemnity insurers (mutual as well as for-profit companies) have to compete in providing basic health insurance coverage. The new Health Insurance Act creates much more opportunities to health insurers to offer preferred provider arrangements and to manage care.

The primary reason of the introduction of price competition and freedom of choice of health plans was to increase the incentives for health plans to improve the efficiency of health care. Prior to the reforms in the 1990s health plans were completely retrospectively reimbursed for the medical expenses of their enrolees and consequently had no stake in a more efficient provision of medical care.

Since several other countries (e.g. Germany and Switzerland) followed the Netherlands by introducing managed competition in their social health insurance schemes, an important question is whether the model works as intended. A crucial precondition for this is that price competition sufficiently motivates health plans to improve efficiency. The purpose of this paper is to investigate whether the precondition of sufficient price competition is met. Therefore, we seek to explain the pricing behaviour of health plans. First, we will identify several factors that might explain price setting behaviour of health plans. Then, we will describe the panel data set that was constructed for all health plans over the period 1996-2004. Next we present the estimation results of several premium models, revealing which factors most likely explain the observed price setting behaviour. We will discuss two factors that are particularly interesting: the role of competition and the role of the health care expenditure forecasts by the health

[1] Non-profit does not imply that a health plan is not allowed to generate any profits (surpluses). The profits of a non-profit plan can be used to improve the organisation, to build up reserve capital or to lower future premiums, but may not be distributed to shareholders as is the case of for-profit plans.

insurers association (ZN). Finally, we will discuss the impact on price setting behaviour after the introduction of the new health insurance system in 2006.

2 Potential determinants of pricing behaviour

Until 2006, all health plans offering basic social health insurance were required to be non-profit mutual companies, implying that they were not allowed to distribute surpluses to shareholders. In a market where all competitors are non-profit, pricing behaviour may not be driven by profit maximisation. This may have important implications if the market is not perfectly competitive and competitors have some latitude to set prices above the competitive level. Indeed, previous research findings provide evidence that competition in the Dutch social health insurance market is likely to be weak because of the low price sensitivity of consumers (Schut and Hassink 2002; Schut, Greβ and Wasem 2003; Van Dijk et al. 2006).

If competition is not sufficient to drive premiums down to the competitive level, the question becomes how health plans determine the community rated premiums. Do they raise premiums to increase profits or do they charge premiums that are just sufficient to cover average cost? Are there persisting differences among health plans in costs and premiums over time? Do different health plans follow different pricing strategies? To answer these questions we investigate what factors could have explained pricing decisions by health plans over the period 1996-2004. We distinguish the following potential determinants.

Cost of providing insurance coverage

First, pricing decisions are likely to be based on the cost of providing insurance coverage. All health plans were required by law to offer the same standardised benefits package. Moreover, although health plans had some room for selective contracting and managing care they hardly used these opportunities (Lieverdink, 2001, CTZ 2004a, 2004b, 2005).[2] Hence, health plans offered essentially the same insurance product. The cost of providing this product may vary across health plans for two reasons. First, the risk profile of the insured population may differ. Although these differences were substantially reduced by the system of risk-adjusted premium subsidies, they were not completely equalised. Insofar differences in risk profile were not compensated by the risk-adjustment system health plans faced different costs of providing basic coverage (see also Douven, 2004). A second potential source of cost variations are differences in administrative expenses. Administrative expenses may vary because of differences in service level, marketing expenses or administrative efficiency. However, since health plans are also involved in providing long term care and supplementary insurance the administrative expenses of providing basic insurance may not reflect the true cost. While health plans are not put on risk for medical long term care expenses, they are responsible for the administrative expenses. All administrative expenses that exceed the budget for providing long term care feed through to a health plans' financial reserves and might result in higher premiums (CTZ, 2000). Although

[2] In recent years, most advances in managing care are made in contracting maternity care (CTZ 2005) Selective contracting with general practitioners and obstetricians has not been used due to a shortage of practitioners and contractual arrangements about quality of care were still in its infancy (CTZ 2004a) .

basic and supplementary health insurance are formally separated and offered by different legal entities, both entities are always part of the same company. More than 90 percent of health plan enrolees buy supplementary health insurance coverage and almost all of them (98 percent) from the same company. Due to the joint marketing and administration of basic and supplementary insurance, companies can easily shift administrative costs from basic to supplementary health insurance (and *vice versa*).[3] Therefore, the community rated premium of basic insurance may not only depend on the administrative expenses of providing basic health care insurance, but also on the administrative expenses for supplementary and long term care insurance.

Health plans' objectives

Second, pricing decisions by health plans are likely to be influenced by the goals they pursue. All health plans are mutual companies and are legally prohibited to distribute profits to shareholders. Because there are no residual claimants, health plans' objectives may differ from profit maximisation.[4] For instance, small independent regionally based health plans often propagate their adherence to "social objectives", while large health plans that are part of a large insurance holding company may be more profit-oriented, reflecting the overall goals and strategies of the holding company. New entrants, on the other hand, may be primarily interested in gaining market share rather than making profit.

Prices of closest competitors

A third potential determinant that is likely to influence pricing behaviour is the level of competition and in particular the price setting behaviour of closest competitors. Health plans' incentive to cut premiums comes from the expectation of increased sales. A health plan that cuts premiums anticipates that some consumers will respond by switching from rival plans.[5] If a sufficient number of consumers are inclined to search for lower-priced health plans, the opportunities for health plans to raise community-rated premiums will be effectively constrained. A survey investigating consumer choice of health plan, however, revealed that consumers tend to stick with a once chosen health plan for a long time (Laske-Aldershof et al. 2003). This is consistent with empirical findings in the US that buyers of insurance tend to have a strong preference for maintaining the status quo (Samuelson and Zeckhauser 1988). Moreover, the same survey indicates that Dutch consumers have a clear preference for the

[3] The problem of cost shifting has been recognized by the Health Insurance Authority (CTZ), which is charged with the supervision of the social health insurance schemes (CTZ 2002). The CTZ finds evidence of a large variation between companies in the ratio of administrative costs of basic and supplementary health insurance and concludes that accounting rules to allocate administrative costs are often unclear, particularly in case health plans belong to a large holding company.

[4] Frech (1996) argues that there is ample evidence that Blue Cross and Blue Shield plans, being the largest non-profit health insurers in the US, pursue different objectives than commercial insurers even though they operate in the same market. In the Dutch health plan market until 2006 the potential for diverging market conduct was even larger than in the US since all health plans were non-profit and therefore spill over effects from for-profit firms were absent.

[5] Usually, by charging a lower price sellers can also increase sales because buyers will buy more and new buyers will be attracted to the market. Health plans do not have this option, however, since coverage is standardised and mandatory for a legally defined population.

largest or most well-known health plan that is located in their region of residence. Hence, health plans may be particularly sensitive to the pricing behaviour of the geographically closest competitors, despite that all but one have extended their statutory working area to the entire country (implying that they have to accept all Dutch applicants).

Level of price competition in the supplementary health insurance market

Since health plans often sell basic and supplementary health insurance as a combined product, the extent of competition in the supplementary health insurance market may have an impact on pricing behaviour in the basic health insurance market. Since supplementary health insurance products are much more heterogeneous than standardised basic coverage, consumer search costs are much higher, raising the opportunity for health plans to set supracompetitive prices. Health plans may use these profits to cross subsidise basic insurance if the basic insurance market is more competitive.

Price signals

Pricing behaviour may also be influenced by price signals set by the government and the insurers' interest association (Zorgverzekeraars Nederland). Each year the government makes a forecast of next year's total health care expenditure covered by health plans to determine the total amount of risk-adjusted premium subsidies and the so-called "administrative premium". The administrative premium is a fixed amount per individual that is not compensated for by risk-adjusted subsidy. If the government's forecast is correct an average health plan would have to charge the administrative premium to their enrolees in order to break even. Once the administrative premium is determined by the government, the insurers' interest association recalculates governments' forecast of health care expenditures which can be used by health plans to assess whether the administrative premium really reflects the average break-even price. Both forecasts may serve as a focal point for health plans' premium decisions.

Focal points may be very useful for health plans to reduce forecasting errors in predicting health care cost inflation and to reduce uncertainty about rivals' behaviour. Both unanticipated fluctuations in health care expenses – often associated with shocks caused by health policy changes – and unpredictable pricing strategies by competitors appear to be the driving forces behind the persisting underwriting cycles (periodic wide swings in premiums and profitability) often observed in health insurance markets (Grossman and Ginsburg 2004). Price signals that serve as focal points may mitigate underwriting cycles if the signal is correct, but may also reinforce underwriting cycles if price signals are distorted by substantial forecasting errors. On the downside, release of information by the government and the insurers' interest association about focal points can facilitate tacit collusion. Health plans that want to coordinate premiums will find it easier to set a community rated premium on which they can implicitly agree. Hence, focal prices may lead to higher-than-competitive prices.

Financial reserves

The magnitude of the financial reserves constitutes another potential determinant of health plans' pricing behaviour. Differences in accumulated reserves may lead to different pricing strategies. For instance, health plans with large financial reserves may lower premiums to gain market share at the expense of profitability, while health plans with limited financial reserves may opt for high premiums to regain a sound solvency position. Grossman and Ginsburg (2004) explain that the accumulation and subsequent spending down of financial reserves by the non-profit Blues plans – as opposed to commercial insurers who had to distribute excess reserves to shareholders – helped to drive the underwriting cycle.

In the Netherlands government regulations on financial reserves may restrict price setting behaviour by health plans. The government not only requires that financial reserves should meet at least a certain minimum solvency margin, but since 2001 also that financial reserves do not exceed a certain maximum level. Hence, health plans close to the minimum level may be forced to raise premiums, while the opposite holds for health plans close to the maximum level. Obviously, if the maximum reserve requirement would be a binding constraint for a substantial number of health plans, this would be a strong indication that price competition is not very effective.

3 Data and descriptive statistics

In order to estimate the effect of the potential determinants of health plan pricing behaviour on actual premiums, we constructed an unbalanced panel of 32 social health plans over the period 1996-2004. The year 1996 was chosen as starting year because, since then, health plans have been increasingly put at risk for the medical expenses of their enrolees and began to set different out-of-pocket premiums. The panel is unbalanced since the number of health plans fluctuated over time due to mergers and entry of new health plans.

Basic features of the social insurance market are presented in table 3.1. Over the entire period the number of health plans decreased, particularly during the first years of the new Millennium. After an initial increase, the number of small health plans seems to have decreased as well. Almost all health plans leaving during the sample period merged with other insurers, while new insurers entering started always with a relatively small population. The data show a clear trend of health plans becoming larger and the market becoming more concentrated. This is confirmed in the last row by the concentration measure HHI (Herfindahl-Hirschmann index), which shows an upward trend.[6]

Children under the age of eighteen are not required to pay out-of-pocket premiums. Since only adults pay an out-of-pocket premium we calculated cost and financial reserves also per "premium paying" (adult) enrolee. Dividing costs and financial reserves by the number of adult enrolees resulted in some cases in extreme outliers for very small health plans. We excluded therefore twenty-one annual observations from our sample of small health plans with a population smaller than 6000 adult enrolees. Health plans set their out-of-pocket premium for the next year at the end of the previous year. By setting their premium we assume that health plans use only information of past (or current) year(s). For a lot of variables, such as financial reserves and administrative costs, it is therefore sufficient to have only information until the end of 2003.

Table 3.1 Number and size of health plans

	1996	1997	1998	1999	2000	2001	2002	2003	2004
Population size (millions)	9.8	9.9	9.9	9.9	10.3	10.3	10.2	10.1	10.2
Total number of health plans	27	29	29	29	26	24	21	21	21
Number of health plans leaving	0	0	2	0	3	2	4	0	0
Number of health plans entering	1	2	2	0	0	0	1	0	0
Health plans with population <10.000	3	5	6	6	2	1	0	0	n.a.
Health plans with population < 50.000	5	7	8	8	6	5	4	4	n.a.
Health plans with population < 100.000	6	8	10	10	7	6	6	6	n.a.
Health plans with population > 500.000	7	7	8	8	9	9	7	7	n.a.
Health plans with population > 800.000	2	2	3	3	4	4	6	5	n.a.
HHI	622	622	663	663	707	711	893	886	n.a.

[6] The HHI is equal to the sum of the squared market shares of all health plans.

3.1 Dependent variable: Out-of-pocket premiums

Health plans get revenues from two different sources. Health plans receive money directly from the government, who collects this money through income-related taxes, and obtain money from charging community-rated out-of-pocket premiums (*PCOM*). The money from the government comprises the risk-adjusted capitation payments plus an administrative budget minus a fixed flat rate per adult enrolee, the administrative premium (*PADM*). An average health plan that charges an out-of-pocket premium equal to the administrative premium would break even if the government's forecast of total medical and administrative expenses are correct. After the announcement of the administrative premium, the insurers' association provides its own expenditure forecast, which can be used by health plans to calculate an adjusted administrative premium. We define *PDIF* as the difference between the official and adjusted administrative premium.

Table 3.2 shows the annual administrative premium (*PADM*) and characteristics of the annual community-rated out-of-pocket-premiums (*PCOM*). From the table follows that the mean out-of-pocket premium charged by health plans was always higher than *PADM*. Although in the years 1997, 1998, and 2001-2004 at least one health plan charged a lower premium than *PADM*. Large fluctuations in *PADM* are due to changes in government policy. For example the government may decide to increase the size of the administrative premium and, as a result, has to transfer less money directly to health plans. In 1997 and 1998 *PADM* was considerably reduced by the introduction of a co-payment scheme, and subsequently increased after the abolition of this scheme in 1999. In our panel estimations $PCOM_i - PADM$ will be the dependent variable. The table shows that there is still a large variation in the mean of this variable. We included *PDIF* in the last row of table 3.2. We observe lower values and less variation in the last row of table 3.2. Lower values imply that the adjusted administrative premium was in every year, except in 2001, higher than the official administrative premium.

Table 3.2 Administrative and community-rated out-of-pocket premiums

	1996	1997	1998	1999	2000	2001	2002	2003	2004
PADM : Annual administrative premium set by government (in euros)	121	71	71	134	141	147	155	257	222
$PCOM_i$: Annual out-of-pocket premium for compulsory insurance charged by health plan *i* (in euros)									
Mean	156.0	98.2	98.1	179.0	189.6	163.6	182.6	344.7	304.6
Standard Deviation	4.0	7.8	8.1	12.6	16.5	26.2	25.1	32.8	30.9
Maximum	163.9	108.4	108.4	200.1	223.3	223.3	238.8	390.0	358.2
Minimum	147.6	65.3	65.3	156.6	156.6	132.1	114.0	239.4	215.4
Mean $PCOM_i$ - *PADM*	35.0	27.2	27.1	45.0	48.6	16.6	27.6	87.7	82.6
Mean $PCOM_i$ - *PADM* - *PDIF*	9.3	11.5	7.0	16.9	18.8	20.0	11.0	27.7	42.6

3.2 Explanatory variables

In section 2, we distinguished several factors that may explain health plans' pricing behaviour. In the next subsections we describe how we measured each of these factors.

3.2.1 Uncompensated medical expenses

As discussed in section 3.1, by calculating the risk-adjusted capitation payments the government projects for each health plan its expected medical expenses for the next year. Of course, health plans may have higher or lower medical expenses than predicted by the government and may recover (expected) deficits/surpluses by charging a higher/lower out-of-pocket premium. We define the variable uncompensated medical expenses as the difference between a health plan's actual medical expenses (including retrospective compensation and equalisation payments) and the medical expenses predicted by the government.[7] Table 3.3 presents some characteristics of the uncompensated medical expenses per adult enrolee (*UMEX*). The mean of *UMEX* indicates that on average, except 1997 and 2001, medical expenses were higher than the risk-adjusted capitation payments, especially in 2002 and 2003 medical expenses turned out to be much higher than predicted by the government.

Table 3.3 Uncompensated medical expenses

	1996	1997	1998	1999	2000	2001	2002	2003
$UMEX_i$: Annual medical expenses per adult enrolee not compensated by the general fund for health plans (in euros)								
Mean	13.6	– 3.4	24.9	10.6	3.2	– 0.6	37.1	38.2
Standard Deviation	9.4	21.3	17.8	18.7	45.5	43.9	33.9	40.0
Minimum	– 9.9	– 4.9	– 2.4	– 4.5	– 116.6	– 124.8	– 66.3	– 98.7
Maximum	28.0	25.5	46.0	40.4	98.1	62.8	78.4	76.1

3.2.2 Administrative expenses

The money that health plans directly receive from the government includes also a budget to cover administrative expenses. Table 3.4 shows the difference between the actual administrative expenses and the administrative budget per adult enrolee (*ADMC*). The table shows that for almost all health plans administrative expenses exceed the administrative budget determined by the government.[8] For some health plans the losses are for some years more than 100 euros per adult enrolee. Note that administrative expenses are less volatile, and therefore better

[7] Health plans do not bear full risk on medical expenses that are higher or lower than the risk adjusted payments as determined by the government. In the case of retrospective compensation the government bears some of the risk and in case of equalisation payments the risk is spread over all insurers (Douven 2004)

[8] Administrative expenses for carrying out long term care are included in the figures. Due to economies of scale the administrative budget per enrolee of large health plans were somewhat smaller than those of small health plans.

predictable, than medical expenses since administrative expenses can generally be better controlled by health plans.

The last row of table 3.4 indicates the mean gains or losses per adult enrolee that remain after subtracting all medical and administration expenses from the community-rated premium. The fluctuation in the overall financial results suggests that an underwriting cycle may be present. In three of the eight years we observe underwriting losses. Especially in 2001 and 2002 many insurers incurred a substantial loss. This was presumably partly caused by a profound change in hospital finance from global budgeting to an open-ended reimbursement. This change was introduced in 2001 by the government to reduce hospital waiting list and resulted in rapid hospital cost inflation. However, the last row in table 3.4 does not tell the whole story about insurers' profitability, since health plans obtain additional revenues from returns on invested reserve capital.

Table 3.4 Uncompensated administrative expenses

	1996	1997	1998	1999	2000	2001	2002	2003
$ADMC_i$: Annual administrative expenses per adult enrolee not compensated by the administrative budget (in euros)								
Mean	8.1	14.5	16.5	17.0	31.6	41.5	39.9	26.2
Standard Deviation	12.8	13.9	15.9	16.0	35.3	26.1	28.3	28.9
Maximum	46.9	46.2	57.3	53.2	165.1	98.9	133.6	129.9
Minimum	– 2.8	0.2	– 0.5	1.9	5.6	4.8	8.8	– 11.8
Mean $PCOM_i$ - $PADM$ - $UMEX_i$ - $ADMC_I$	13.3	16.1	– 14.3	17.4	13.8	– 24.3	– 49.4	23.3

3.2.3 Financial reserves

Health plans are required by law to maintain a minimum level of financial reserves. The required solvency margin equals about 8% of the annual medical expenses for which the health plan is at risk.[9] As an indicator of a health plan's wealth we use the freely available reserve capital (*FRES*), which are the financial reserves per adult enrolee minus the required solvency margin.[10] Table 3.5 reveals that the mean sharply decreased in 2002 and 2003. This was caused by losses incurred on medical and administrative expenses (see table 3.4) and by the crash in the stock market.[11] Table 3.5 also shows that in five years some health plans were in financial

[9] Part of the medical expenses (e.g. fixed hospital costs and individual costs exceeding a certain threshold) are largely retrospectively compensated or equalised. Since this proportion has been steadily reduced over time, health plans' financial risk increased from 13% in 1996 to about 53% in 2004 (Prinsze et al, 2005). Consequently the required solvency margin increased concurrently.

[10] The data of reserve capital in a certain year is surrounded with uncertainty because it may take several years before the books of that year can be closed.

[11] One important caveat of the data is that variables such as *UMEX*, *ADMC*, *FRES* and others are obtained from different data-sources and are constructed at different points in time. For example, data for *FRES* comes from the annual balance sheet of health plans and are already available before the final settlement of accounts for *UMEX* appear. Insurers therefore use estimated values of *UMEX t*o complete the annual balance sheet. For our analysis this means that constructed variables such as $PCOM_i$ - $PADM$ - $UMEX_i$ - $ADMC_i$ should be seen as indicators and not as actual values.

trouble since the minimum of *FRES* was below zero. In 2003, four health plans had to borrow money to meet the required solvency position. We expect that a health plan with *FRES* that is close to or even below zero will have to increase next year's premium relative to its competitors.

Since 2001, the law imposes also a maximum limit to the financial reserves of a health plan.[12] As a rule of thumb one could say that the maximum level of reserves is equal to about 2,5 times the required minimum solvency margin. If a health plan's financial reserves exceed the maximum limit it has to return the surplus to the government or has to reduce its out-of-pocket premium. For a health plan, the latter strategy is of course more attractive. In our panel we use the variable *RRES*, which is the residual reserve capital per adult enrolee that a health plan can accumulate before the maximum margin is reached. Although the maximum limit to financial reserves was imposed in 2001, health plans may well have anticipated to this regulation in the preceding year. Therefore, in our panel we chose 2000 as starting year. We expect that if a health plan's *RRES* is close to zero – implying that its financial reserves approach the maximum limit – it will reduce next year's premium relative to its competitors. Table 3.5 shows that *RRES* increases over time, but that there is a large variation among health plans. Each year some health plans are close to the maximum limit.

Table 3.5 Financial reserve position of health plans (euros, per adult enrolee)

	1996	1997	1998	1999	2000	2001	2002	2003
$FRES_i$: Freely available reserve capital per adult enrolee (net of the required solvency margin) for health plan i (in euros)								
Mean	64.9	79.9	55.3	65.6	81.1	77.3	49.1	44.8
Standard Deviation	41.0	71.1	43.1	56.7	61.9	62.7	58.3	54.0
Maximum	191.2	362.5	134.8	159.4	218.6	239.1	177.2	177.7
Minimum	4.8	7.1	– 31.2	– 47.4	– 36.4	1.2	– 38.1	– 27.8
$RRES_i$: residual reserve capital per adult enrolee that can be accumulated until the maximum limit is reached, for health plan i (in euros)								
Mean					101.2	132.6	175.3	197.6
Standard Deviation					108.1	100.9	97.0	109.6
Maximum					376.6	358.1	391.8	480.0
Minimum					– 49.2	12.2	– 7.0	– 12.4

[12] Not all financial reserves fall under the scope of this regulation.

3.2.4 Competition

We discern three variables to examine the role of competition in health plans' pricing decisions. First, as explained in section 2, health plans may be particularly sensitive to the pricing behaviour of its geographically closest competitors because enrolees tend to look primarily at the most well known regional health plans. We first defined for each health plan a set of its regionally closest competitors. Then we constructed for each health plan a variable that indicates whether the health plan charged a relatively low or high premium compared to its closest competitors. This variable can be constructed in a number of ways; one could compare the health plans premium with the average (or minimum) premium of its competitors or with the average (or minimum) premium of all health plans in the market. We will report the outcomes for these variables in our paper qualitatively. In our estimations in the paper we will report the results of a dummy variable. This dummy variable, *PCOMP*, is one if in a certain year the premium of this health plan is higher than the average premium of its competitors, and zero otherwise. In Appendix A we present the table for each health plan and, as we constructed them, their main competitors.

Second, we examine the sensitivity of health plans to a loss of market share. If premium competition plays a role then we expect that health plans that lose market share are more willing to reduce premiums to regain it. We measure the change of market share by the annual change in the number of adult enrolees per health plan (*GPEE*). Table 3.6 shows a large and skewed variation in *GPEE*, which can be explained by mergers and by the presence of a number of very small health plans that can easily double their enrolment.

Table 3.6 Market share and annual growth rate of health plans

	1996	1997	1998	1999	2000	2001	2002	2003
$MSHA_i$: Market share of health plan *i* (in %)								
Mean	4.17	4.17	4.35	4.35	4.00	4.17	4.76	4.76
Standard Deviation	2.99	3.00	3.24	3.24	3.58	3.58	4.57	4.53
Maximum	11.79	12.15	12.29	12.40	12.31	12.56	15.12	14.77
Minimum	0.11	0.13	0.15	0.18	0.09	0.10	0.10	0.19
$GPEE_i$: Annual growth rate of the number of adult enrolees of health plan *i* (in %)								
Mean	5.0	5.3	5.5	1.9	8.1	5.4	2.0	10.4
Standard Deviation	12.3	10.5	18.5	3.8	20.5	12.1	8.6	37.6
Maximum	49.7	38.5	86.4	15.7	95.1	47.4	32.3	168.9
Minimum	– 3.6	– 3.0	– 1.9	– 1.6	– 3.9	– 3.3	– 5.2	– 4.2

A third variable we distinguish is the market share of a health plan (*MSHA*), which is defined as the number of enrolees divided by the total number of enrolees. Large health plans may have competitive advantages due to economies of scale in administration, in purchasing care or in reducing insurance risk. Therefore, large health plans may be inclined to charge lower premiums. Of course in a competitive market this strategy is only sensible if consumers are sufficiently price sensitive. On the other hand large health plans may have more market power, which may enable them to set higher prices. Thus we expect the market share variable to be negatively related to premium if price competition is effective, and a positive relation when price competition is not effective. Table 3.6 shows that the largest health plan has a market share of more than 10% of the market and the smallest health plan a market share of about 0.1% of the market.

3.2.5 Supplementary insurance premiums

As explained in section 2, pricing decisions by health plans for basic insurance may be influenced by pricing of supplementary insurance since these products are closely linked and some cross subsidisation is possible through the allocation of administrative expenses. If customers are more sensitive to the price of supplementary coverage, health plans might be willing to reduce supplementary insurance premiums at the expense of basic insurance premiums (by shifting administrative expenses to the basic insurance scheme) or *vice versa*. If cross-subsidisation is important, we expect that supplementary health insurance premiums are inversely related to basic insurance premiums (all other things equal).

Data on supplementary coverage and premiums were derived from a commercial database for insurance agents (ROLLS), supplemented with information obtained directly from a number of health plans which were not included in that database (or not during the entire period). From 2002 onwards data is obtained from a website that compares premiums and the extent of coverage for a broad range of insurance products, including health insurance (www.independer.nl). Most health plans offer a choice between three or four, and some even more, different supplementary benefit packages.

Premiums of the various supplementary benefit packages are highly correlated. For the empirical analysis we used premiums charged for the most popular supplementary benefits package (*PSUP*), including at least regular dental care and prolonged physiotherapy. A cautionary note here is that supplementary benefits packages are not identical but vary across health plans. Hence the observed premium variation might be partly explained by variation in coverage. Although health plans are allowed to risk rate, most of them still charge community-rated premiums for supplementary coverage and almost all health plans do not charge premiums for children under the age of 18. Table 3.7 shows that supplementary premiums have increased substantially over time. The large increase in 2004 can be largely explained by a reduction of the mandatory basic benefit package and the concurrent expansion of supplementary insurance coverage.

Table 3.7 Premiums for supplementary insurance

	1996	1997	1998	1999	2000	2001	2002	2003	2004
$PSUP_i$: Annual premiums for supplementary insurance charged by health plan i (in euros)									
Mean	59.7	64.3	66.8	74.5	83.4	89.0	105.5	116.0	172.5
Standard Deviation	21.5	22.0	21.7	18.4	26.7	29.6	23.0	32.7	46.8
Maximum	98.0	98.0	108.0	117.1	179.7	196.0	186.0	204.0	288.0
Minimum	27.2	27.2	27.2	39.5	49.8	54.2	67.2	69.6	99.0

3.2.6 Health-plan objectives

As explained in section 2, health plans may differ in the goals they pursue, which may result in differences in pricing behaviour for different types of health plans. In our panel estimations we will distinguish among four types of health plans that may pursue different goals (see appendix A for more detailed information). The first types are small independent regionally based health plans that propagate their adherence to "social objectives". These health plans might not be interested to engage in price competition to gain market share. Second types are large traditional health plans that operate mainly nationally. These health plans might be more interested in gaining market share than in making profits. The third category we discern consists of health plans that are part of a large multi-line insurance company. We expect that these health plans might be less willing to sacrifice profitability for gaining market share and thus may charge relatively high premiums. Finally, we identify new entrants, since they are expected to follow the most aggressive pricing strategy in order to realise a rapid increase of market share.

4 Panel data estimations

4.1 Five different estimation models

We apply five different types of (unbalanced) panel data models for explaining the dependent variable $PCOM_i - PADM$. Since health plan have to set next year's premium at the end of the current year, we use one year lagged explanatory variables in our panel data estimations. The first model (Model A) is the fixed (period and cross section) effects model. In this model both 8 year and 27 health plan dummies are included in the estimation model. The year dummy captures time-effects that are constant for all individual health plans. The fund dummies capture individual health plans effects that are constant over time. It should be noted that the year dummies eliminate any cross-section invariant variables, such as *PDIF*, from the model. In the second model (Model B) we apply only the fixed fund effects and therefore can include *PDIF* in our estimations. In model C we substitute random fund effects for the fixed fund effects in model B. In model D we replace the random fund effects of model C by four fixed group effects, each group representing different types of health plans. Finally, in model E we ignore all fund and period effects and run a pooled OLS-regression with only one constant. The idea behind these five estimation models is not to obtain the "correct" model but to show possible effects of the explanatory variables. The "true" effect of an explanatory variable on the dependent variable is difficult to measure when it is correlated with the fixed or random effects. The five models present therefore for each explanatory variable a range of possible effects.

4.2 Constructing explanatory variables

The explanatory variables are in some cases split up into parts. For example *UMEX* is split up in $UMEX^+$, positive values of *UMEX* and negative values are set to zero, and $UMEX^-$, negative values of *UMEX* and positive values are set to zero.[13] The idea behind this split up is that health plans may respond different to gains and losses.

Since *FRES* and *RRES* are strongly (negatively) correlated we assign a health plan uniquely to one of the following three reserve capital groups: $FRES^{<50}$, $FRES^{>50}$ or $RRES^{<50}$. Our hypothesis is that health plans that are close to the required solvency margin, or close to the maximum margin, are likely to respond differently when setting their out-of-pocket premium than health plans that are safely away from both margins. We constructed for health plans close to the required solvency margin a group $FRES^{<50}$, which equals *FRES* for observations lower than 50 euro. Similarly, for health plans close to the maximum margin we constructed the group $RRES^{<50}$ which equals *RRES* for all values smaller than 50 euros. Finally, $FRES^{>50}$ contains all

[13] This procedure is not followed for *ADMC* since almost all values of *ADMC* are positive (see table 3.4).

other health plans that are not assigned to the other two groups.[14] The cut off point of 50 euros is rather arbitrary, but we will report results of other cut off points as well.

For *GPEE*, the annual growth rate of the number of adult enrolees of a health plan, we will use only negative values (and set the positive values to zero). The hypothesis is that health plan with negative growth rates might charge a lower premium in the next year in order to attract new customers. This variable is named $GPEE^{-}$.

In estimation model D we grouped health plans by distinguishing four different types of health plans: health plan that are part of a larger concern, health plan that operate mainly nationally or regionally and new (relatively small) health plans that entered the market during the sample period (see Appendix A).

Finally, in model D and E we left out four explanatory variables. The reason is twofold. First of all the sign of these variables in model A, B and C indicated that there was no reason of a causality but only of a (insignificant) correlation. Second, some values of the explanatory values were missing and leaving them out increased our number of observations with 11.

4.3 Estimation results

Table 4.1 summarises the results. First of all we find positive values for $UMEX^{+}(-1)$. The estimated coefficients in models A to E imply that a health plan that lost money on medical expenses charged for every lost euro between 0.15-0.59 euro higher premium next year. The values are lower than one implying that not all uncompensated medical expenses of the previous year feed through to the premium. The positive coefficient of $UMEX^{+}(-1)$ increases from estimation model A to E, suggesting that $UMEX^{+}(-1)$ is positively correlated with the fixed effects in model A, B and D, and with the random effects in model C. A likely reason may be that imperfect risk adjustment leads to structural differences in uncompensated medical expenses across health plans. These structural differences maintain over the years and are partly captured by the fixed or random cross-section effects.[15] We observe a similar pattern for $UMEX^{-}(-1)$, but we find coefficients ranging from −0.04 and 0.18, which turn out to be lower than the estimated coefficients for $UMEX^{+}(-1)$. This suggests that health plans react asymmetrical to gains and losses and those losses feed through to the premium faster than gains.[16] The estimated coefficients for $ADMC(-1)$, ranging from 0.03 - 0.36, imply that

[14] Technically $FRES^{<50}$ ($RRES^{<50}$) equals $FRES$ ($RRES$) for observations lower than 50 euros and equals 50 euros for all other observations. Finally, $FRES^{>50}$ is equal to $FRES-50$ and zero for all health plans belonging to the other two groups.
[15] In Douven (2004) it is also shown that during the period 1993-2001 structural differences across health plans exist.
[16] Coefficient tests reject (at a 5% level) in all five models the hypothesis that the coefficient of $UMEX^{+}(-1)$ equals the coefficient of $UMEX^{-}(-1)$.

Table 4.1 **Estimation results of *PCOMi -PADM* for 1996-2004 (standard errors in parentheses, * indicates that estimators are significant at a 5% level).**

Dependent variable*:*
PCOM$_i$ *-PADM*

	Estimation Method				
	Model A:	Model B:	Model C:	Model D:	Model E:
Model	Panel effects: fixed period, fixed fund	Panel effects: no period, fixed fund	Panel effects: no period, random fund	Panel effects: no period, fixed grouping funds	Panel effects: no period, no fund
Estimation	OLS	OLS	EGLS	OLS	OLS
Explanatory variables					
Constant	30.0	2.9	– 2.1	–	6.6
	(15.0)	(11.1)	(7.5)		(6.2)
$UMEX_i^{+}(-1)$	0.15	0.28*	0.40*	0.56*	0.59*
	(0.09)	(0.08)	(0.07)	(0.06)	(0.07)
$UMEX_i^{-}(-1)$	– 0.04	0.04	0.13	0.03	0.18*
	(0.09)	(0.08)	(0.07)	(0.08)	(0.07)
$ADMC_i(-1)$	0.10	0.03	0.17*	0.36*	0.30*
	(0.09)	(0.08)	(0.06)	(0.06)	(0.06)
$RRES_i^{<50}(-1)$	0.39*	0.27*	0.25*	0.10	0.18
	(0.10)	(0.09)	(0.08)	(0.09)	(0.10)
$FRES_i^{<50}(-1)$	– 0.40*	– 0.43*	– 0.31*	– 0.35*	– 0.22*
	(0.09)	(0.09)	(0.08)	(0.08)	(0.07)
$FRES_i^{>50}(-1)$	– 0.06	– 0.03	– 0.03	– 0.03	– 0.05
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
$GPEE_i(-1)^{-}$	0.19	0.9	– 0.9	–	–
	(1.58)	(1.5)	(1.3)		
$PCOMP_i(-1)$	5.2	4.8	7.2*	–	–
	(2.8)	(2.7)	(2.6)		
$PSUP_i$	1.5	2.9*	1.4*	–	–
	(1.3)	(0.6)	(0.5)		
$MSHA_i(-1)$	– 1.8	– 1.5	0.2	–	–
	(2.1)	(2.1)	(0.6)		
PDIF	–	0.79*	0.77*	0.85*	0.80*
		(0.08)	(0.08)	(0.09)	(0.09)
New fund dummy	–	–	–	– 8.2	–
				(7.0)	
Regional fund dummy	–	–	–	15.4*	–
				(6.3)	
Concern fund dummy	–	–	–	9.3	–
				(6.7)	
National fund dummy	–	–	–	14.4*	–
				(6.6)	
R^2	0.895	0.885	0.797	0.759	0.735
Adjusted R^2	0.858	0.852	0.782	0.744	0.724
Durbin-Watson	1.75	1.85	1.49	1.25	1.17
Number of observations	164	164	164	175	175
Cross-sections included	27	27	27	28	28

administrative expenses are not yearly passed on fully to the premium. The low coefficients, however, may partly be explained by our bias in measuring administrative expenses since, as we explained in section 2, health plans can easily shift administrative expenses from basic to supplementary and long term care insurance. The increasing coefficients from model A to model E suggests that $ADMC(-1)$ is also correlated with the fixed and random effects.

High coefficients for medical and administrative expenses suggest that health plans react very strong on yearly cyclical fluctuations, while low coefficients would indicate that health plans are not able or willing to translate higher cost into higher premiums. This could mean that competition is effectively constraining premiums and may force health plans to reduce costs in the long run.

Our findings suggest that a sound solvency position is an important long term health plan objective. We find significant (on a 5% level) negative coefficients for $FRES^{<50}(-1)$ in all five estimation models implying that health plans with a critical solvency position charge higher premiums to retain a sound solvency position. For example, a health plan with a solvency position equal to the required solvency margin sets premiums about 10-20 euros higher than health plans without a critical solvency position. We also find that health plans with a reserve capital close to the maximum margin charge lower premiums than health plans with a larger distance to the maximum margin. A health plan at the maximum of its reserves charges about 5-20 euros lower premiums. As one would expect, health plans close to the maximum margin prefer to return the excess of capital to the insured, instead of returning it to the government. In all five models, health plans with a sound solvency position charge somewhat lower premiums, although the effects are small and not significant.[17]

Since the coefficient of $GPEE_i(-1)^-$ is not significant in any of the three models (and even changes sign) we conclude that we have to reject our hypothesis that health plans losing enrolees charge lower premiums in the following year. This does however not mean that no health plan follows this strategy. The positive sign in model A and B may indicate that some health plans charge lower their premium after loosing enrolees while others do not.

The estimated coefficients of the premium for the closest competitors (*PCOMP*) show that health plans charging higher premiums than their competitors do not charge lower premiums in the following year. On the contrary, we find that most health plans charging a higher premium than their competitors do so every year.[18] This result is in line with a relatively high and positive Spearman correlation coefficient for nominal premiums.[19]

The positive and sometimes significant coefficient for *PSUP* implies that we find no evidence for cross subsidisation with supplementary premiums. We therefore reject our hypothesis that health plans with low nominal premiums for the basic benefit package charge

[17] Changing our cut-off point of 50 euros to 25 euros or 75 euros yielded similar results but with lower R^2's

[18] We found the same result for other constructions of competitiveness variables.

[19] See also Van Dijk et al. (2006).

(to recover potential losses on the nominal premium) higher premiums (than average) for the supplementary package.

Interestingly enough, the difference between the official and adjusted administrative premium (based on the insurers' association forecast) *PDIF*, seems to play an important role. We find a coefficient close to one in all four estimation models B, C, D and E. This suggests that health plans incorporate the mark-up (on top of the administrative premium calculated by the government) of the insurers' association forecast almost fully when setting their own nominal premium.

Finally, we find in model D that new funds charged on average about 20 euros lower premiums than health plans that operated already on the market before 1996.[20] New health plans could follow such a price strategy because their medical expenses were much lower than of the incumbent health plans.[21]

Our results show that the explanatory variables are correlated with the individual fixed health plan effects. Using model selection criteria, such as the adjusted R^2 or Akaike's information criteria, however give only slightly higher values for model A than for model B, while the values are substantially higher than for model C, D and E. On the other hand, because of this correlation the "true" effects of *UMEX* and *ADMC* may not be adequate in model A and B but may be better captured by model D and E. At least economic intuition would suggest certain causality between *UMEX* and *ADMC* and premiums.

We performed sensitivity and robustness analysis by constructing other type of variables, considering different time periods and different type of estimators. This sensitivity analysis, of course, yielded different estimators but they never changed drastically. We believe that our general results are well captured in our estimations presented in table 4.1.

[20] We tested the hypothesis that the coefficient for the new fund dummy (8.2) equals the coefficient for the regional (15.4), concern (9.3) or national fund dummy (14.4). In all three cases these hypothesis are rejected at a 5% level.

[21] These large differences in medical expenses were partly caused by inadequacies in the risk adjustment system. For example, in the year 2000 the privately insured lower-income self employed were legally obliged to obtain social health insurance coverage and most self employed opted for the cheaper new health plans (Schut et al. 2003). Self employed appeared to have much lower medical expenses than average and therefore an indicator of being self-employed or not was included in the risk adjustment system in 2003.

5 Discussion

From the previous section, two issues are particularly important and warrant further discussion. First, we will discuss the role of competition in health plans' pricing decisions. Next, we will expand on the role of the premium forecast by the insurers association on health plans' pricing behaviour.

5.1 The role of competition

Our empirical results indicate that competition did not play a major role in premium setting by health plans. First, health plans did not respond to a loss of enrolees by reducing their premiums relative to those of their competitors. Next, premium differences among closest competitors were quite stable over time. Third, health plans with higher costs were able to translate a substantial part of these costs into higher premiums while health plans with profitable medical expenses were more reluctant to pass these on to their premiums. In fact, the most important drivers for health plans' pricing behaviour were the legally specified minimum and maximum levels of financial reserves. Health plans just above the minimum solvency margin were significantly more likely to raise their relative premiums, while health plans close to the maximum ceiling were significantly more likely to reduce their relative premiums. The limited role of competition in pricing behaviour is consistent with the low price elasticity of health plan choice, as observed by several studies as mentioned in section two.[22] Apparently, consumers are not sufficiently price sensitive to constrain health plans' pricing behaviour.

If premiums are not effectively constrained by competition, one would expect that all health plans – except those being close to the maximum reserve limit - would charge high premiums and would make huge profits. Instead of all premiums tending towards a monopoly level, we observe substantial and persistent premium variation, while until 2002 the average premiums did not deviate strongly from the administrative premium (see Figure 5.1). This suggests that not all health plans act as profit maximisers and that the legal prohibition of for-profit goals might have had a mitigating effect on health insurance premiums. Thus "social objectives" or objectives such as gaining market share may have played a role as well. The latter objective would be consistent with our finding that entrants charged significant lower premiums than the incumbents. These lower premiums may have had a mitigating effect on the premiums of the incumbents.[23]

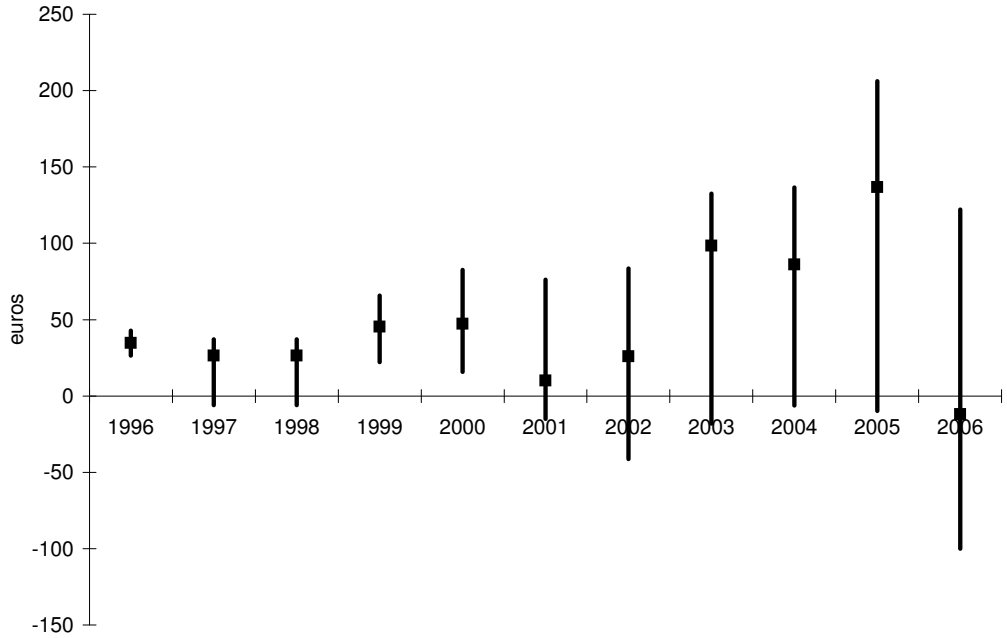
Moreover, rather than substantial profits we observe that health plans incurred substantial losses in medical expenses in 2001 and 2002, resulting in decreasing financial reserves. The most likely explanation for this observation is, however, that all health plans severely

[22] These studies report price elasticity's until 2001. A recent survey shows that the proportion of enrolees switching health plans is slightly but steadily increasing from 2001 to 2005 (Laske-Aldershof and Schut 2005).

[23] Unfortunately we do not have information about the time of announcement of premiums in each year. The premium(s) of the health plan(s) that first announce(s) their premium(s) may be used as benchmark by other health plans.

underestimated the escalation of medical expenses due to the relaxation of the budgetary restrictions by the government. In addition health plans did not anticipate the crash of the stock market that reduced their financial reserves. This may also explain why all health plans substantially raised their premiums (in comparison with the administrative premium) in 2003, 2004 and 2005 (see figure 5.1).

Figure 5.1 Variation of nominal premiums and distance to administrative premium (■ = mean distance).[24]



5.2 The role of the insurers association's forecasts

The considerable uncertainty about health care cost inflation, may also explain why we find an important impact of the forecast of total health care expenditures by the insurers' association on health plans' pricing behaviour. Figure 5.2 compares next year's forecast of total medical expenses by the government and by the insurers association with the realised expenditures (which are scaled to zero). In all years except 2001 the government forecasts of total medical expenses were too low (probably because the government tends to overestimate the effects of policy measures to reduce health care expenditure growth), with the largest gaps in 2002 and 2003 (about 50 euro per adult enrolee). The insurers association projected higher forecasts which proved to be more accurate (according to usual forecast criteria) but often exceeded actual expenditure growth. According to our panel estimations, health plans seem to follow the insurers association forecast quite closely. This corroborates our finding that health plan pricing

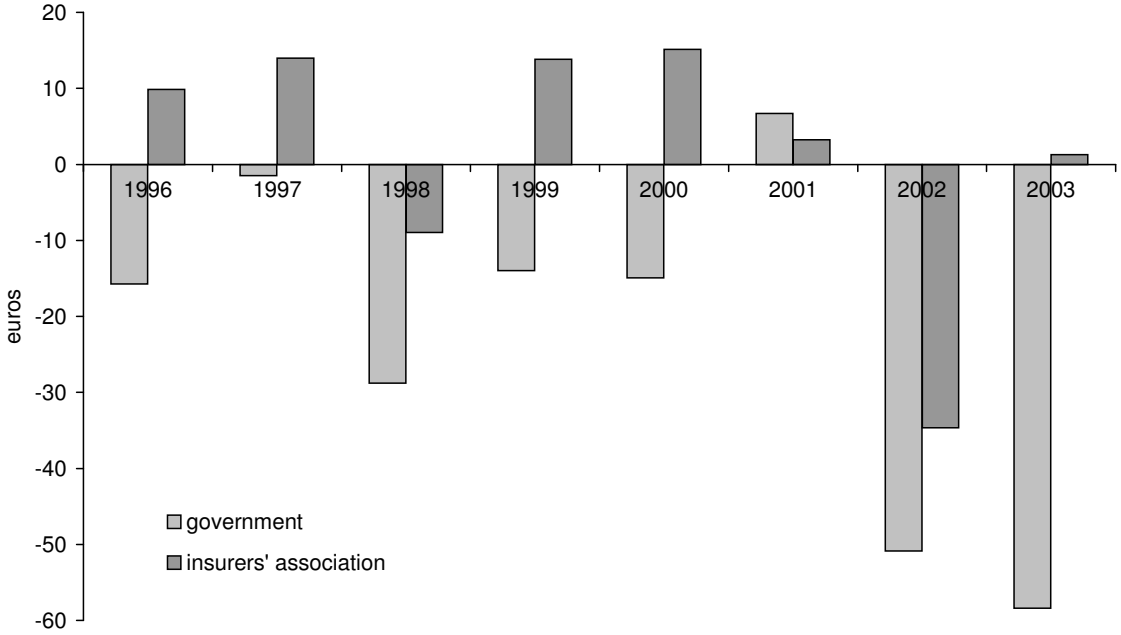
[24] For 2006, we have used premiums for individual and collective contracts in the figure. Furthermore, we have estimated the impact of administrative expenses in the administrative premium since health plans no longer receive budgets for their administrative expenses in 2006.

behaviour is much more influenced by safeguarding a sound financial position than by price competition.

The price signals by the insurers association may reduce uncertainty and forecasting errors by individual health plans and thus may enhance financial stability. For 2002, however, both the government and the insurers association, produced substantial forecast errors. These errors not only have reinforced the underwriting cycle but health plans may also have anticipated on possible forecast errors by charging higher premiums in subsequent years (see figure 5.1).

Price signals may also facilitate tacit collusion, since they make implicit price agreements much easier.[25] This may particularly be so if competitive pressure is low, as appears to be the case in the Dutch social health insurance market.

Figure 5.2 Medical expenses forecasts of the government and insurers' association (distance to actual values)



[25] See Ivaldi *et. al.* (2003) for the economics of tacit collusion.

6 The impact of the new health insurance system

In 2006, the Dutch health insurance system has been profoundly reformed. The new mandatory national health insurance scheme permits any non-profit or for-profit health insurer meeting certain standards to offer basic health insurance coverage. Hence, the former distinction between social and private health plans has been abolished. Consumers pay for on average 50 percent of the cost of basic insurance by a community-rated premium that has to be determined by health insurers. In 2005 the government estimated that the average community rated premium would have to be about 1100 euro per adult enrolee in 2006 (children until 18 years of age are "free"). Low-income groups will receive a subsidy if the average community rated premium charged by the health insurers exceeds a certain proportion (e.g. 4% for single adults) of their actual or a legally determined threshold income (e.g. in case no income is earned). The other 50% of the cost of basic health insurance is financed by income related contributions from employers, pensioners and the self-employed. Health insurers can compete for customers by offering lower flat rate premiums and by different preferred provider arrangements and HMO's.

Consumers can switch insurers at annual open enrolment periods and a prospective risk adjustment scheme will compensate health insurers for enrolling predictably high-risk individuals (these risk-adjusted compensations are paid out of the health insurance fund that is filled with the income related contributions). Health insurers are allowed to offer premium discounts for group contracts (up to 10 percent of a similar individual contract) and for people who opt for a voluntary deductible that may vary between 100 and 500 euro per year (in discrete steps of 100 euro). These deductibles are on top of a mandatory no claim rebate of 255 euro per year for the entire population.

Both former social health plans' enrolees and the former privately insured were obliged to choose a new health insurance contract for basic insurance and could opt for supplementary insurance. However, people who did not make a choice before March 2006 are automatically covered for the same benefits by the same health insurers as in 2005. Nevertheless, for all Dutch citizens in 2006 the choice setting radically changed and by the end of 2005 it was widely expected that many customers would reconsider their choice of health plan (Deloitte 2005). Indeed, two recent surveys among about 600 and 1070 respondents conducted in January 2006 show that already 9-10 percent of the people had switched to another health plan and another 25-40 percent were considering to do so (TNS NIPO 2006a, Delnoij et al. 2006). Furthermore, half of these respondents mentioned price as the most important reason for (considering) switching. At the end of February 2006, a following survey among 600 respondents indicated that about 25 percent of the people had switched to another health plan (TNS NIPO 2006b).

The threat of a substantial loss of customers seems to have had a profound impact on health plans' pricing behaviour. As shown in Figure 5.1, in 2006 for the first time health insurers charged lower premiums for individual contracts than the administrative premium calculated by the government. Anticipating that many customers would reconsider their health plan choice,

most health insurers appear to have set their premium as low as possible. Another plausible reason for undercutting the administrative premium is that in 2006 the government decided to take away the risk that the administrative premium was set too low.[26] In addition, the health plan that first announced its premium for 2006 (the "first mover") did so much earlier than in previous years and got much more media exposure. This might well have contributed to more intense price competition because it triggered other health plans to follow soon and to undercut the first mover's premium. Furthermore, several health plans offered large premium discounts (up to 10% or about 100 euro per individual per year) for group contracts. These group contracts were not only employment-based but were offered also to other groups, sometimes with a large number of potential insured such as the major labour unions (in total about 1,5 million members), the national sport federation (in total about 1,5 million members), and a large cooperative bank (in total about 1,5 million members). Group contracts were even offered to interest associations for the elderly and several specific groups of chronic patients (e.g. diabetes and rheumatoid arthritis).[27] For almost all group contracts premiums are set far below the administrative premium forecast, which is supposed by the government to be the break-even price. Since most individual premiums are below this break-even premium, insurers cannot compensate the expected losses on group contracts by cross-subsidisation from individual contracts. Thus losses have to be financed out of the financial reserves.[28] The health insurers association already warned in the press that most health plans would incur substantial losses in 2006, which could result in an 18 percent premium increase in 2007 (Bassant 2005, *NRC Handelsblad*, January 4, 2006).

Thus, in sharp contrast to the period 1996-2005, competition seems to play a dominant role in pricing decisions by health insurers in 2006.[29] An important question is whether this is a temporary effect due to the shock effect of the profound health insurance reform or whether competition will have a lasting impact on health plan pricing behaviour.

On the one hand, several factors can be distinguished that may enhance a future role of competition. First, the 2006 health insurance reform increased the awareness among the

[26] The administrative premium in 2006 is estimated according to the rules of the social health insurance system. Since the risk adjustment system had to be extended to the former private health insurers, the accuracy of the system could not be fully guaranteed (Douven 2005). Therefore, the government has decided to fully retrospectively compensate health plans' risk-adjusted budgets for a possible wrong prediction of total medical expenses. Furthermore, the government has decided to compensate 90 percent of a more than 35 euro deviation between the actual and compensated medical expenses per enrolee in 2006. This implies that health plans did not have to take into account the possibility of a wrong forecast by the government and can use the focal point of the government as a correct starting point for premium setting. This also explains why the forecast of the insurers' association for total health care expenditures became irrelevant for premium setting in 2006. This aspect, as well as the decrease in health plans' individual risk, increases certainty (or reduces risk) in health plans' premium calculations and is therefore likely to reduce the level as well as the variation of premiums.

[27] Group contracts with high-risk groups such as elderly and patients with several chronic diseases are feasible because insurers are compensated for these risks by the risk-adjustment scheme.

[28] Former private health insurers have substantial financial reserves because the required solvency margin was reduced from 24 percent of total premiums in 2005 to less than 8 percent in 2006.

[29] Contrary to what might be expected, competition did not result in a lower premium variation (measured by the variance) than in previous years. A plausible explanation for this is that the unequal distribution of financial reserves enabled several health insurers to charge premiums substantially below the break-even price.

population of the possibility to switch health plans. Second, group contracts are likely to play a much larger role[30] and these groups are likely to be much more price sensitive than individual buyers. Third, the increased possibilities for health plans to manage care may intensify efforts to improve the efficiency of care delivery. Fourth, the entry of former private for-profit insurers may have an important spill-over effect on the behaviour of non-profit health insurers.[31] Non-profit health plans might be forced to follow potentially more aggressive pricing strategies and cost reduction efforts by for profit health plans. Fifth, reliable consumer information about premiums and performance of health plans is steadily improving and easier accessible, which may enhance effective consumer search. Finally, there may be an income effect. Since for former social health plan enrolees the community-rated premiums were raised from about 400 to 1100 euro per year, the impact of these premiums on their budget substantially increased, which might induce them to search for lower premiums.

On the other hand, other factors can be discerned that may reduce future competition. First, increasing policy differentiation in basic and supplementary insurance may increase search cost. Empirical and experimental studies show that more choice and greater complexity of choice after a certain point will inhibit action and reduce the quality of choices that are made (Frank and Lamirand 2005). Second, health plans may increasingly practice selective underwriting for supplementary health insurance, since supplementary coverage is likely to expand and making profit is likely to become more important. Selective underwriting for supplementary insurance is likely to discourage consumers to switch health plans because consumers clearly prefer to buy both basic and supplementary insurance from the same health plan. Finally, the increase in community rated premiums (in comparison with the social health insurance market before 2006) may lead to smaller differences in *relative* premiums between health plans. This may reduce consumer price sensitivity and the incentives for health plans to compete on price. Economic psychological experiments demonstrate that consumers are quite sensitive to relative price reductions (Tversky and Kahneman 1981) which is corroborated by a choice experiment in the Dutch health insurance setting (Schut and Laske-Aldershof 2001).

[30] Before 2006, group contracts played a minor role in social health insurance. Group contracts were not allowed for basic insurance (the mandatory sickness fund scheme) and in the supplementary health insurance market only 14 percent of the enrolees had a group contract. In 2005 about 55% of the insured in the private indemnity insurance market had a group contract (VEKTIS, 2005). The vast majority of these group contracts were employment based.

[31] Former sickness funds have to remain non-profit for a period ten years if they want to keep the financial reserves that were accumulated before the reform (since these reserves are considered to be "public money"). If they convert to a for-profit status within a period of ten years after the introduction of the Health Insurance Act (2006) they will have to return these financial reserves to the state.

7 Conclusion

We estimated a premium model to determine which factors explain the price setting behaviour of health plans in the Dutch social health insurance scheme during the period 1996-2004. Our empirical results indicate that competition did not play a major role in premium setting by health plans. Despite the lack of effective competition, premiums do not converge towards the monopoly level. Instead, we observe a substantial and persistent premium variation, while in most years the average premium is only somewhat higher than the "administrative premium" as yearly set by the government. The administrative premium is about the break-even price for an average health plan if the government's forecast of total health care and administrative expenditures is correct. The most important drivers for health plans' pricing behaviour appeared to be the legally specified minimum and maximum levels of financial reserves. The forecast of next year's health care expenditure by the government and the adjusted forecast by the insurers' association play a major role in health plans' pricing decisions. This also supports the supposition that health plan pricing behaviour is much more influenced by safeguarding a sound financial position than by price competition.

In 2006, all Dutch citizens were faced with a radical change in choice setting due to a major reform of the health insurance system. Health insurers expected that many customers would reconsider their health plan choice. The threat of a substantial loss of customers had a profound impact on health plans' pricing behaviour and most health plans charged substantially lower premiums than forecasted by the government. The expectation that many customers would reconsider their health plan choice, appears to have triggered health plans to set their premium at the lowest possible level. In particular group contracts were offered below the break-even price at the expense of health plans' financial reserves. Another plausible reason for undercutting the administrative premium is that in 2006 the government decided to take away the risk that the administrative premium was set too low.

Thus, in sharp contrast to the period 1996-2005, competition seems to play a dominant role in pricing decisions by health insurers in 2006. Whether this will be a temporary or lasting phenomenon is hard to predict. We discerned several factors that are likely to enhance future price competition but other factors that are likely to reduce it.

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Appendix A

In table A.1, we describe for each health plan its regional closest competitors as we constructed them. A regional competitor is set between brackets if it has merged.

Table 7.1 Health plans and selected regional competitors

Health plan	Selected regional competitors
Unive	ZK Spaarneland (ZK Achmea), PWZ, Groene Land
OHRA	Amicon, Anoz, Topzorg
Anova	Zilveren Kruis
ZAO	PWZ, Zorg & Zekerheid
OZ	CZ groep, VGZ, Trias, ZK-Achmea
DSW	ZK-Achmea, Azivo, Delta Lloyd
Anoz	Groene Land, Amicon
Agis	Zilveren Kruis, Groene Land, Amicon
Salland	Groene Land, Amicon, Anoz (Agis)
NZC	ZAO
Topzorg	Amicon, Ohra
Pro-Life	Anova, ZK Achmea
Stad Rotterdam	Achmea, DSW, OZ
ONVZ	Zorg & Zekerheid, Agis
Anderzorg	Geove
OZB	Amicon, Groene Land
Nederzorg	Agis
Trias	OZ, Zilveren Kruis, VGZ, Agis
Nuts	Azivo, DSW
Azivo	Nuts, DSW
ZK Spaarneland	Unive, PWZ, Zorg & Zekerheid
ZK Noordwijk	Unive, Zorg & Zekerheid
Geove	Anderzorg, Groene Land
ZON	Groene Land, Salland
PWZ	Unive, ZK Achmea (ZK Spaarneland), Agis
De Friesland	Anoz (Agis), Groene Land
Zorg & Zekerheid	Agis, Trias
Groene Land	Amicon, Anoz (Agis), Geove, De Friesland
VGZ	CZ, OZ, Zilveren Kruis, Amicon
ZK Achmea	DSW, OZ, CZ
CZ groep	OZ, VGZ, Zilveren Kruis
Amicon	Anoz (Agis), Groene Land, VGZ

In table A.2, we grouped health plans by distinguishing four different types of health plans: health plan that are part of a larger concern (i.e. health plans that deliver other type of indemnity insurance), health plan that operate mainly nationally or regionally and new (relatively small) health plans that entered the market during the sample period.

Table 7.2 Type of health plan

Type of health plan	Health plan
Regional health plan	Amicon (before 2000), Anova, ANOZ, Azivo, De Friesland, DSW, Salland, Topzorg, Trias, ZAO, ZK Spaarneland, ZK Noordwijk, Zorg & Zekerheid,
National health plan	Agis, Amicon (after 2000) CZ-groep, Geove, OZ, Unive, VGZ, ZON.
New entrant	Anderzorg, Nederzorg, ONVZ, OZB, Stad Rotterdam.
Concern	Het Groene Land, Nuts, OHRA (Delta Lloyd-OHRA concern), PWZ, ZK Achmea.