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GROUP CONTRACTS**

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Health insurance competition: the effect of group contracts*

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Abstract

In countries like the US and the Netherlands health insurance is provided by private firms. These private firms can offer both individual and group contracts. The strategic and welfare implications of such group contracts are not well understood. Using a Dutch data set of about 700 group health insurance contracts over the period 2007-2008, we estimate a model to determine which factors explain the price of group contracts. We find that groups that are located close to an insurers' home turf pay a higher premium than other groups. This finding is not consistent with the bargaining argument in the literature as it implies that concentrated groups close to an insurer's home turf should get (if any) a larger discount than other groups. A simple Hotelling model, however, does explain our empirical results.

Key words: health insurance, health-plan choice, managed competition

JEL classification: I11, L13

1. Introduction

Group contracts in health insurance are a widespread phenomenon. In countries like the US, the Netherlands, Austria, Israel, Germany, France and Belgium people can choose whether they want to buy insurance individually or via a group like their employer. Such group contracts are typically cheaper than individual contracts. There are a number of hypotheses why this is the case each with different welfare implications (discussed below). Most papers on group

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contracts are based on US data (see e.g. Gabel et al., 2002; Trude et al., 2002). The problem with US data is that (group) contracts differ in generosity. Contracts with different degrees of generosity may also attract different risk groups. This changes the expected cost of the insured customers and affects the price of the insurance contract. These two effects are hard to control for. The main advantage of the Dutch data that we use, is that basic health insurance in the Netherlands is a homogeneous good. Hence we do not need to control for generosity. Further, basic health insurance is both mandatory and risk adjusted. This makes adverse selection issues less prevalent.

We have three main results. First, groups pay a lower price than individuals, and bigger groups tend to pay a lower price than smaller groups. Second, groups that are (geographically) located close to the insurer's home turf pay a higher price than other groups (in the next section we discuss the Dutch situation and explain why the insurer's home is a meaningful concept). Third, an insurer with relatively many group contracts close to home tends to price lower in the individual market. We show that these features are consistent with a simple Hotelling model capturing competition on the insurance market with exogenous costs.

We contrast our explanation with the following insurer-provider-bargaining model. An insurer tries to win group contracts to generate (quickly) a critical mass of customers. Representing a size-able customer base, the insurer can threaten a provider to send these customers to another provider if treatment prices are not reduced. Hence, the argument goes, the insurance premium paid by a group is lower than an individual contract because a group allows the insurer to bargain down treatment prices. Part of these gains due to lower prices is passed on in a lower insurance premium. This bargaining argument is mentioned in papers like Brooks et al. (1997) and Sorensen (2003).

In the Dutch situation this bargaining model is not consistent with the data. In the Netherlands providers are organized on a regional level, and therefore the bargaining power of an insurer depends upon the number of enrollees in the region. An insurance contract with a group that is spread out over the country does not affect the insurer's bargaining position (to the same extent) with any particular provider. According to the bargaining model, such contracts should be more expensive than group contracts that are concentrated in a certain region. Although there are signs that a larger insurer market share in a hospital results in somewhat lower unit prices for hospital services (NZA, 2009), we do not observe lower premiums for groups that are concentrated around hospitals. On the contrary, we find that the premium paid by a group concentrated in the insurer's home region is higher than the premium paid by other groups that are spread out over the Netherlands. Although one could argue that an insurer cannot raise its bargaining power vis-a-vis providers further in its home region by gaining additional customers, this cannot explain this finding. If additional customers in its home region cannot reduce treatment prices further, treatment prices must be low already in its home region. Hence the premium for such a group should be low as well (at least as low as either the premium in regions where treatment prices are higher for this insurer or for groups that are spread out over the country). Since this is not what we find, we cannot use the bargaining model to explain our findings.

The significance of this is not that the bargaining model is irrelevant when it comes to group contracts. Indeed, the reform in the Dutch health insurance market is quite recent and

insurers are still learning how to leverage their bargaining power vis-a-vis providers. In this sense, the bargaining explanation may become relevant over time in the Dutch market. The importance of our findings is that even without the bargaining effect, group contracts affect prices via the strategic interaction between insurers (as captured by the Hotelling model). In countries such as the US, where insurer-provider bargaining plays a more dominant role (see for example Getzen, 2007), these strategic competition effects are present as well. This observation has consequences for the welfare aspects of group contracts.

The welfare consequences of the provider-insurer bargaining model above are ambiguous. First, it is not clear why group contracts should lead to a more efficient delivery of care. For example, consider a group of individuals. Whether these individuals are insured together through a group contract or through individual contracts with the same insurer does not really alter the bargaining position of an insurer versus a provider. In other words, it is not clear why the group contract should get a discount in the first place. This result may change for employer-based groups that tend to exert more bargaining power and obtain higher discounts than a random group of individuals (Lave et. al.1999). To the extent that this is driven by cherry-picking (people working at certain employers may –on average– be more healthy) the discounts can be undesirable from a social point of view.

Moreover, Porter and Olmsted Teisberg (2006: 38) argue that the bargaining effect of group contracts is actually not welfare enhancing. Their reasoning goes as follows. First, they note that the discounts given to groups cannot be explained by efficiency gains. There may be some cost savings in the administration of bigger groups and other economies of scale¹ but not to the extent of the discounts observed in the US. Hence the groups are used to bargain lower prices with providers. But these bargaining gains for insurers are losses for providers and hence do not add social value.² In this sense, any investments made by insurers (say, in marketing and acquisition costs) to win group contracts are socially wasteful. Porter and Olmsted Teisberg actually go one step further and claim that this type of “provider squeezing” by insurers reduces providers’ incentives to innovate. The idea is that insurers’ bargaining power is so much enhanced by group contracts that providers cannot (or hardly) appropriate the gains from innovation. This leads to underinvestment by providers in socially valuable innovations.

Our theoretical explanation of the prices paid by group contracts is not based on bargaining but on price competition for a group in a simple Hotelling model. If an insurer wants to convince a group to accept its contract, it needs to convince the median voter (in this group) to accept the contract. For a group in its home turf this is easy and hence it can ask a relatively high price (but not higher than the price for an individual contract; otherwise no one would accept the group contract). A group that is further away from the insurer’s region (e.g. because it is spread out over the country) has a median voter that is further away from the insurer. Hence a lower price is needed to convince the median voter and win the contract. Further, this has implications for prices on the individual market. As an insurer has more group contracts in its

¹For instance, Pauly and Percy (2000) argue that group insurance in the US is less costly than individual contracts because of lower administrative costs.

²Strictly speaking this assumes that the demand for treatments is relatively inelastic so that there are no dead-weight loss considerations.

own region, the number of inframarginal consumers on its individual market is reduced. This reduces the premium the insurer sets on the individual market. Our data are consistent with this result.

This allows us to derive a condition under which all consumers (both people with group contracts and individual contracts) gain from the introduction of group contracts. Roughly speaking, if group contracts reduce the number of inframarginal consumers more than they reduce the number of marginal consumers, they are a Pareto improvement for consumers.

A seminal paper on group insurance in the US is Pauly et al. (1999). This descriptive paper weighs the pros and cons of individual versus job-based health insurance. The advantages of individual insurance primarily consist of tailor-made policies (given its costs) to individual needs, whereas with group insurance the choices are limited. Further, even if all employees share the same preferences, there is no guarantee that the employer will choose the plan that they all want. In the Netherlands these issues play no role. The government defines the basic package for health care insurance, which is equal for all individuals. There is thus no differentiation allowed between (group or individual) insurance policies for the basic package within the country. Another argument of Pauly et al. (1999) in favor of individual insurance is that in the US this is more portable and permanent than group insurance, meaning that there is no hesitation in changing a job because there is no need to change insurance. In the Netherlands group contracts do not limit the mobility of switching jobs since the benefit package is very similar for all persons and differences in premium between insurers are very small compared to the financial consequences of switching jobs. Also the US argument that employers receive tax advantages for group insurances (Pauly and Percy, 2000) does not hold for the Netherlands. In the Netherlands the employers' contribution to health insurance is independent from the group or individual insurance contracts that employees choose. Such differences between the US and the Netherlands make it more straightforward to interpret the Dutch data.

An important feature of group contracts is that they may trigger competition between insurers. Gabel et al. (2001) show that in the US there has been fierce price competition for group insurance in order to enter new geographic markets and accumulate market share. Our Hotelling model captures this effect and allows us to link it to the effects on the individual market. Marquis and Long (2000) indicate that about one third of group health insurance in the US is directly negotiated with providers. The advantage of these contracts is that possible bargaining gains with providers feed directly through to a lower group premium. Direct negotiating with providers is currently not an option for groups in the Netherlands. Further, our analysis suggests that Dutch insurers either do not have bargaining gains from group contracts or do not transfer such gains to consumers via lower premiums.

The setup of our paper is as follows. The next section introduces the institutional context in the Netherlands and discusses the recent reforms. In section 3 we present our empirical results for group contracts. In section 4 we discuss our estimation results for individual contracts. The Hotelling model is introduced in section 5. Section 6 concludes.

2. The Dutch reform

The introduction of the first elements of managed care competition in the Netherlands started in the early 1990's. The Dutch market for health insurance was split into social and private segments based on an individual's income. The social segment was compulsory and covered all individuals below a defined income threshold (about two-thirds of the population). Not-for-profit health insurance firms (so-called sickness funds) were operating in the social segment and were not allowed to make any profit. In the private segment, private insurers served the remaining one-third of the population that was above the income threshold. Sickness funds had a series of restrictions that private insurers did not have. They had to contract with every hospital in the country, offer a basic insurance package which coverage was set by the government, participate in the risk-equalization scheme run by the government, satisfy solvency requirements and accept any citizen at community-rating premiums (Dijk et al. 2008).

Until 1992 sickness funds had a legal regional monopoly. After 1992 came the introduction of freedom of choice of health insurers. This led to the abolishment of sickness funds' territorial monopolies and allowed new health insurers to enter the market. However, there was hardly any switching of insurers by consumers and almost no competition between sickness funds. Also in our data from 2007 and 2008 it is still the case that the former monopolist has the largest market share in its region. Hence for the former sickness funds we can define a home region.

As of 2006, the Netherlands introduced a model of managed competition for the whole population. The primary reason for the introduction of price competition and freedom of choice of health insurers was to increase the incentives for health insurers to reduce the costs of health care.

Essential features of the new model are a private insurance market, universal mandatory coverage for a basic benefit package, community rating, open enrolment, and a system of risk adjusted premium transfers. The basic health insurance scheme covers "essential care" which is defined by law. Moreover, there is supplementary insurance covering all health services not included in the basic package that can be purchased on a free choice basis. About 90% of the population purchases supplementary insurance either from the same or from another health insurer. Compared to basic health insurance, supplementary insurance is quite small and covers about 10% of total health care costs. Although health insurers may have either a for-profit or not-for-profit status, they are legally obliged to accept everybody applying for the basic package, regardless of age, gender, or health status. While before 2006 group contracts were only available for the privately insured, after 2006 the whole population was allowed to buy a group contract.

Group insurance is quite popular in the Netherlands. In 2006 about 53% of the Dutch population chose to buy group insurance; this percentage rose to 57% in 2007 and 59% in 2008 (Smit and Mokveld, 2008). Health insurers show significant differences in their share of group insurance; this ranges from 0% to 95%.

Since everyone is free to choose an individual contract, group contracts offer a discount on the premium of the basic package compared to individual insurance policies.³

³Such discount has a legal maximum set at 10%. In 2006 the average discount for group contracts was equal to 6,6% rising to 7% in 2007 and 2008. In our sample the legal maximum was binding for few group contracts.

Group contracts are mostly offered by employers. In 2007, 69% of all group contracts were offered via the employer. This percentage has been quite stable since the reform in 2006. Other possibilities to take out group insurance are through patient organizations, although their share still remains quite small, and so-called "pseudo" group insurance, such as groups that have formed on the internet or on the basis of sport associations. In 2007, out of all individuals joining a group contract 1% joined a patient group and 30% had another type of contract (NZa, 2007). Studies by Schut (2006) and NZa (2007) report that access to the market of group health insurance is good in the Netherlands and there are no signals of risk selection by insurers.

Summarizing, on the Dutch health insurance market for basic care insurers sell a homogeneous product and adverse selection issues play no role. Consumers in a region have a tendency to buy from the former local monopolist in that market. Consumers are free to buy insurance on an individual basis or via a group (say, employer) they belong to. These are the elements we will use in the Hotelling model below.

3. Group contracts

In this section we describe the pricing behavior of Dutch group health insurance contracts. The starting point for estimating the pricing behaviour is the following standard linear regression model.

$$p_i = \alpha + X_i' \beta + \varepsilon_i$$

In this model the dependent variable is the price or annual premium p_i paid by consumers for a group contract i for basic health insurance. The set of explanatory variables X_i are modelled as dummy variables which we will explain later. The error term ε_i is assumed to satisfy the standard set of Gauss-Markov assumptions, so that we derive the OLS-estimators for α and β . In the next two subsections we describe our data and estimation results

3.1. Data on group contracts

We have collected premium data for most large insurance group contracts in the Dutch market. The data is collected from 27 health insurers (of a total of 41 insurers). These insurers have reported all group contracts with a market share larger than 1% (compared to their total group population) with a minimum of 10 group contracts. Furthermore, at least three of the reported contracts should be not employer-based (e.g. patient groups and internet group). Since the dataset contains mainly the larger group contracts in the Netherlands this may cause selection bias. For our purpose, this means that if insurers would use different price setting strategies for group contracts with a market share below 1%, our results may not fully capture the effects on the market for small group contracts. However, our main finding is that a Hotelling price competition model dominates a bargaining model in the Netherlands. It is unlikely that the market for very small group contracts (that hardly raise the bargaining power of an insurer vis-a-vis providers) overturns this result.

The idea behind this maximal discount was to generate spillovers from the group market to the market for individual insurance contracts.

The survey yielded 447 group health insurance contracts for 2007 and 343 contracts in 2008. There is a panel of 233 group contracts that are present in both years 2007 and 2008.

Table 1 summarizes some descriptive statistics of the various group contracts for both years. For 2007 we have 251 employer-based contracts that cover about 2.1 million insured and 196 other type of contracts that cover 2.7 million insured. For 2008 these figures are respectively 164 employer-based contracts (1.3 million insured) and 179 other type of group contracts (3.8 million insured). Due to the introduction of out-of-pocket co-payments in 2008, the prices for insurance contracts decreased from 2007 to 2008.

The data covers only four (relatively small) contracts for patient organisations in both years (covering about 16000 insured in 2007 and 7000 insured in 2008). Schut and de Bruijn (2007) have reported at least 45 group contracts with patient organizations in the Netherlands, but most contracts are too small in size and therefore are not reported by health insurers in our survey. In the last row of table 1 we also present the average price for individual insurance contracts which are substantially higher than the prices for group contracts. In section 4 we will focus on the pricing of individual contracts.

Table 1: Descriptive statistics of prices and population of group health insurance contracts

YEAR		2007			
Type of group contract	Number of contracts	Average price	Minimum	Maximum	Number of insured
Employer-based	251	1047.98	1015.20	1179.00	2115616
Patient organization	4	1069.03	1015.20	1143.63	16076
Members of a labour union	43	1082.45	1047.06	1179.00	828026
Internet group	9	1071.31	1017.90	1137.51	58093
Umbrella Organization	58	1060.86	1015.20	1126.08	636352
(Local) Municipalities	27	1070.15	998.44	1143.63	266541
Other	55	1073.91	1025.46	1162.80	933229
Total	447	1067.96	998.44	1179.00	4853935
Individual Contracts		1153.33	1125.00	1224.00	
YEAR		2008			
Employer-based	164	1020.62	952.78	1134.00	1269306
Patient organization	4	1039.11	1004.09	1099.98	7311
Members of a labour union	23	1035.48	984.54	1134.00	503207
Internet group	16	1018.71	952.78	1054.50	353338
Umbrella Organization	50	1015.50	963.36	1114.55	1538232
(Local) Municipalities	24	1021.40	980.10	1099.98	298268
Other	62	1024.41	973.95	1109.40	1117475
Total	343	1025.03	952.78	1134.00	5087137
Individual Contracts		1105.50	1058.64	1198.44	

In our regression model we consider various explanatory variables that may explain why prices differ among group contracts. We distinguish the following factors:

Ownership status of insurer

We distinguish four dummy categories for ownership in the private insurance system. The first are non-profit health insurers, these are former sickness funds that operated before the reforms only in the social health insurance system. The second type are for-profit insurers that operated before the reforms only in the private insurance system (default category). The third type are non-profit insurers that operated in both, the private and social insurance system, before the reforms. The fourth category are new insurers that entered the market after the reforms in 2006. In table 2 we present frequency statistics of the four categories. More than half of the health insurance contracts in our data are delivered by health insurers that operated in both markets, the private and social insurance, before the reforms.

Type of insurance contract

We label group contracts into three dummy categories: in kind contracts, reimbursement (default category) and mixed contracts. With in kind contracts the insurer is legally responsible for providing care while with a reimbursement contract the insured picks a provider and gets reimbursed by the health insurer. In a mixed contract some provision of health care is organized in-kind while other type of costs are reimbursed. Table 2 shows that in both years more than 40% of the contracts were reimbursement contracts. The table reflects the general observation in the market that many insurers changed their in-kind contracts in 2007 into mixed contracts in 2008. Although in practice the differences between the various types of contracts is small, it may reflect signals in the market that in-kind contracts not always guarantee free provider choice. So changing the in-kind contract into an other type of contracts could also have been used by insurers to signal free provider choice to consumers.

Size of group contract

We label the size of group contracts into three dummy categories. We distinguish small group contracts with a population of less than 1000 enrolees (default category); medium group contracts of a population between 1000 and 10000, and group contracts of more than 10000 enrolees. Table 2 shows that most contracts in our data belong to the second category.

Type of group

We distinguish two groups: employer-based groups and other type of groups (default category) as we have reported in table 1. In the category other groups we distinguish different type of groups. There are groups with a common disease, called patient groups, and internet groups, groups that can mainly obtain insurance through the internet. Most of these groups are rather small and therefore only a few of them are included in our dataset. More groups enter the data that are member of a labour union, that operate under an umbrella of a Dutch organisation (some examples are the Dutch sports, Dutch Art organisation or the Dutch Royal Touring Club) or have as common element that they belong to a (local) municipality. In general the size of these groups is larger and therefore more of them enter our data set.

Duration of contract

Groups and insurers can make contracts for one year (default category) or more years (represented by one dummy). Although more than 90% of contracts are one-year contracts it is interesting to see whether they differ in price from long term contracts. Note that we do have some missing observations. For some contracts we could not get information on the contract duration.

Insurer sells other types of insurance

We distinguish three categories: an insurer may sell only health insurance (default category), an insurer may sell health insurance and travel insurance, or an insurer sells health, travel and other types of insurance. Table 2 shows that almost 50% of insurance contracts are with insurers that sell many types of insurance.

Concentration and location of groups

Finally, we come to the variable that we are particularly interested in. Insurance contracts are labeled "nearby" if all enrollees in the group are concentrated in a geographical area about as large as a Dutch province and where this group is located in the insurers' region or main place of business. As explained in section 2, this is a meaningful concept since the Dutch health insurance market is (still) to a large extent divided along regional lines. This is the legacy of the regional monopolies of the former sickness funds.

A bargaining model would predict (if any) a larger discount for nearby group contracts than other type of group contracts. Since an insurer has most individual contracts in its own region his bargaining power vis-a-vis any provider is strongest in its own region. Winning an additional nearby group contract would enhance his bargaining power vis-a-vis the providers in its own region even more. If the bargaining theory is applicable here, this would reduce treatment prices for this insurer and allow for a lower premium. Groups that are not concentrated in a region do not enhance an insurer's bargaining power (vis-a-vis any provider in particular) to the same extent as in its own region and hence are expected to pay a higher premium. Note that there are some signs that insurers with a large market share in a hospital pay lower unit prices for hospital services than insurers with a smaller market share (NZa, 2009). So, we test also whether insurers pass on potentially lower treatment prices (obtained through bargaining with providers) to their concentrated nearby group contracts.

To test this prediction, we compare the premiums for nearby group contracts with other group contracts (that are classified as "other group contracts" in table 2). Table 2 shows that we could label about 20% of the insurance contracts as "nearby". All "other group contracts" cover about 80% of the market. Note that we have some missing observations for this variable because we could not always label contracts into one of both categories.⁴

⁴During our robustness analyses we split the "other group contracts" further up into three different types of group contracts: "concentrated & far away" (contract is in insurers i 's home turf but won by competing insurer j –this hardly happens), "not-concentrated" and "insurer with no local focus". However, the effect of "nearby" on the premium remained positive and significant. Further, the coefficients of the other three groups did not differ significantly from each other.

Table 2. Frequency statistics of explanatory variables

	2007		2008	
	% of total	total	% of total	total
Former sickness fund	10.3%	447	6.4%	343
Former for-profit	18.6%	447	21.3%	343
Non-profit (both systems)	57.5%	447	65.6%	343
New insurer	13.6%	447	6.7%	343
Reimbursement	40.0%	447	41.4%	343
In-kind	46.8%	447	24.8%	343
Mixed	13.2%	447	33.8%	343
size<1000	32.0%	447	22.2%	343
1000<size<10000	45.0%	447	46.0%	343
10000<size	23.0%	447	31.8%	343
Employer	56.2%	447	47.8%	343
Duration	92.2%	410	96.9%	327
Health insurance	11.4%	447	13.4%	343
Health & travel	39.2%	447	37.9%	343
Health & travel & more	49.4%	447	48.7%	343
Nearby	22.1%	410	18.7%	325
Other group contracts	77.9%	410	81.3%	325

3.2. Estimation results for group contracts

We estimated several versions of the linear regression model using OLS with robust standard errors (S.E.).⁵

⁵In regressions with robust S.E. the estimated coefficients are the same as in the standard OLS linear regressions but the estimates of the S.E. are more robust to meet assumptions concerning normality and homogeneity of variance of the residuals. We also performed seemingly unrelated regressions (SUR) and the results (not reported) were similar.

Table 3. OLS estimates of group price contracts for basic health insurance

	All data	2007	2008
Constant	1124.1 [5.6***]	1118.2 [7.8***]	1090.2 [7.2***]
Former sickness fund	33.1 [4.6***]	29.7 [5.9***]	33.9 [7.7***]
Former both	-3.3 [3.7]	-8.4 [5.4]	0.9 [5.0]
New insurer	-17.2 [6.2***]	-9.9 [7.7]	-38.8 [6.8***]
In-kind contracts	-11.3 [3.2***]	-8.3 [4.4*]	-19.3 [3.7***]
Mixed contracts	7.4 [3.8]	10.8 [6.5*]	9.5 [4.4**]
1000 < size contract <10000	-12.0 [3.9***]	-7.7 [5.8]	-17.9 [5.2***]
10000 < size contract	-11.6 [4.4**]	-6.6 [6.4]	-17.9 [5.9***]
Employer	-10.8 [2.2***]	-12.2 [3.1***]	-12.4 [2.6***]
Duration	-7.5 [4.4*]	-5.1 [6.2]	-16.9 [6.2***]
Health & travel insurance	-42.8 [3.7**]	-37.6 [4.9***]	-49.9 [5.4***]
Health & other insurances	-29.9 [3.4***]	-31.1 [4.6***]	-28.6 [4.4***]
Nearby	5.5 [2.6**]	8.1 [3.6**]	4.6 [3.4]
Year Dummy 2008	-50.7 [2.0***]	-	-
R^2	0.63	0.36	0.59
Number of observations	687	375	312

Robust standrard errors are expresed in brackets. Significance is indicated with the following gnificance levels: *=0.1, **=0.05, ***=0.01.

In table 3 we report our estimation results for both years, and for 2007 and 2008 separately. Differences in the estimates between 2007 and 2008 can be used as an indication for robustness of our results but may also be the result of changing behaviour of health insurers or consumers (see the discussion of in-kind contracts below for a possible example of learning over time).

Ownership status of insurer

The upper part of table 3 shows that former sickness funds charged a much higher premium than other insurers. Many of these non-profit insurers entered the reforms with limited financial

reserves compared to private insurers, and therefore were not able to use aggressive pricing strategies (Douven and Schut, 2006). Private insurers may have a stronger focus on making profits by gaining market share in the short run. Since especially in the early years after the reforms groups strongly responded to price (Douven et al. 2007), it is likely that private insurers have incurred substantial losses by gaining market share with low prices for group contracts.⁶ Our results indicate that especially new insurers follow aggressive pricing strategies to gain as much market share as possible in their early years.

Type of insurance contract

In-kind contracts were significantly cheaper than reimbursement and mixed contracts. Although most in-kind contracts still include all health care providers (NZA, 2008), the general perception of the Dutch consumers was that in-kind contracts imply a restriction in provider choice. Such restrictions lower administrative costs for insurers and may make it easier to channel consumers to preferred providers (Sorensen, 2003, Zweifel et. al., 2006). Our finding that in-kind contracts are cheaper in 2008 than 2007 may indicate that insurers make more use of selective contracting and that consumers learn that a restriction in provider choice yields a premium discount in return.⁷

Size of group

Table 3 also shows that the size of a group matters. At first sight this is consistent with a bargaining model where a bigger group allows the insurer to bargain more aggressively with providers. However, as shown in the next section, it is also consistent with a model of insurer competition with exogenous costs. Note that the effect of group size turns out to be non-linear. The main gain is in moving beyond 1000 participants. The next step to more than 10,000 does not lead to further price reductions.

Type of group

Employer-based groups are significantly cheaper than other groups, which was also indicated by Schut and de Bruijn (2007) and NZA (2008). Several reasons may play a role here. Most employers do not only negotiate on the price for basic health insurance but negotiate also on supplementary insurance or other specific benefits such as prevention or reintegration measures. To the extent that price competition concentrates on the segment of basic health insurance (e.g. because this segment with homogeneous goods is more transparent for both employers and employees/consumers), insurers compete fiercely to win such contracts. Such a contract then gives access to more lucrative add-on contracts like supplementary insurance (a heterogeneous product) for employees and reintegration services with the employer. Another difference is that it is easier for insurers to risk rate employer-based groups since these contracts are more access restricted while other groups are more open in their acceptance of membership.

Duration of contract

Although not significant, the variable duration shows the expected sign and longer contracts are less expensive than annual contracts.

Insurer sells other types of insurance

⁶DNB (2008) has reported losses of health insurers of about 500 million euro in 2007 on basic health insurance.

⁷We have no explanation for the fact that mixed contracts are significantly more expensive than reimbursement contracts.

We find strong evidence for cross-selling of insurance contracts. Insurers that offer also travel and other type of insurance set substantially lower prices than other insurers. This can be explained by the fact that consumers tend to buy insurance policies from the same insurer. Two arguments play a role here. First, the transparency argument, the homogeneous product basic health insurance is more transparent than other types of insurance. Second, basic health insurance is mandatory while other types of insurance are not. It seems that health insurers are willing to price basic health insurance aggressively since winning such a contract can lead to the sale of other –more profitable– insurance policies.

Concentration and location of groups

The bargaining model sketched in the introduction predicts that nearby groups (concentrated in an insurer’s home region) pay a lower (or at least not higher) premium than other groups. Our regressions show the opposite result. Groups close to an insurer’s home turf pay a high premium. The result for the year 2008 is less significant which may indicate that the effect is vanishing over time.

We performed other regressions to see whether the results are robust to different specifications. As explained in footnote 4 we further subdivided group contracts that are not “nearby”. We also extended our model by adding dummy variables representing the six insurer “mother” concerns in the Netherlands (most health insurers are “daughters” of one of these companies). These insurer-specific characteristics picked up some variation, but our basic result on nearby of groups did not change.

4. Individual contracts

We already mentioned in the previous sections (see also table 2) that prices for group contracts were substantially lower than for individual contracts. The idea of this section is to analyse whether group contracts influence the price setting behaviour of insurers for the individual insurance premiums, and especially whether a high percentage of “nearby” group contracts increases prices for individual contracts. In the latter case there are negative spillovers from the group market on the individual market. The bargaining model sketched in the introduction does not feature predictions for individual prices. One possible explanation for a negative spillover effect is the so-called “waterbed effect” (see, e.g. Inderst and Valletti (forthcoming)). The Dutch 10% limit for the gap between prices for group and individual contracts for an insurer can be interpreted as an attempt to reduce such negative externalities.

To test this hypothesis we compare the price of the individual contracts of an insurer with the percentage of “nearby” contracts of this insurer. A note here is that we have much less observations on prices on individual contracts than on group contracts, because each insurer is allowed to set only one price for the individual contract. In table 4 we present some descriptive statistics of our data. The frequency statistics are in line with statistics that we presented in table 2⁸. The percentage of “nearby” group contracts of insurers ranges from 0% (38% of the

⁸Note that some individual insurers appear more than once in the dataset because they provided different type of individual insurance contracts (in-kind, reimbursement or also mixed contracts) with different prices.

cases in 2007 and 45% of the cases in 2008) to 93.9% in 2007 and 84.7% in 2008.⁹

Table 4. Frequency statistics of explanatory variables

	2007		2008	
	% of total	total	% of total	total
Former sickness fund	6.9%	29	10.3%	29
Former for-profit	17.2%	29	17.2%	29
Non-profit (both systems)	58.6%	29	62.1%	29
New insurer	17.2%	29	10.3%	29
Reimbursement	41.4%	29	41.4%	29
In-kind	44.8%	29	24.1%	29
Mixed	13.8%	29	34.5%	29
Health insurance	13.8%	29	17.2%	29
Health & travel	31.0%	29	34.5%	29
Health & travel & more	55.2%	29	48.3%	29
	Max	Min	Max	Min
Nearby	93.9%	0%	84.7%	0%
Prices for individual contract	1198	1059	1224	1125

We performed similar OLS estimations as in the previous section but now with the price of individual contracts as dependent variable. Table 5 shows the results. Note that many of the results are similar to the results in table 3. The main difference is that the "nearby" variable has a negative impact on the individual price for basic health insurance. Although the results are not always significant, the sign is always negative and opposite to the sign in table 3.¹⁰ Therefore, an insurer with many "nearby" groups in the market sets a lower price for individual contracts than other insurers. Yet, the price charged for the "nearby" groups is higher than the price charged to other groups. The next section introduces a model to explain these findings.

⁹ Note that since we do not have all group contracts of all insurers, the percentages here should be interpreted with some caution. The percentage represents the number of consumers of an insurer having a "nearby" group contract divided by the number of consumers in all group contracts of this insurer. We see this as being suggestive of the percentage of people in the insurer's region that have a (not necessarily "nearby") group contract. Although the latter is the theoretically speaking relevant percentage (see below), we do not have it. To illustrate, for a group contract that is spread out over the country we do not know how many people in a certain region bought this contract.

¹⁰ Since the results of the regressions are based on only 58 observations, some caution with respect to these results is necessary. We performed some robustness analysis by using different definitions for the "nearby" variable, but in all cases we found a negative effect (although the result was not always significant).

Table 5. OLS estimates of individual price contracts for basic health insurance

	All data	2007	2008
Constant	1198.5 [11.5***]	1201.2 [7.8***]	1143.7 [18.4***]
Former sickness fund	21.4 [16.8]	8.5 [24.4]	40.2 [26.1]
Former both	-2.7 [9.3]	-4.0 [10.5]	2.9 [15.6]
New insurer	-31.2 [12.2**]	-24.1 [13.2*]	-35.7 [23.2]
In-kind contracts	-19.6 [7.9**]	-13.0 [9.0]	-30.1 [14.4*]
Mixed contracts	-7.9 [8.8]	0.6 [12.9]	-15.7 [12.8]
Health & travel insurance	-29.6 [11.3**]	-37.3 [13.2**]	-19.9 [19.7]
Health & other insurances	-20.8 [10.1**]	-35.5 [11.7***]	-3.7 [17.8]
Nearby	-35.8 [20.1*]	-11.4 [25.4]	-80.2 [37.1**]
Year Dummy 2008	-48.2 [6.8***]	-	-
R^2	0.60	0.49	0.48
Number of observations	58	29	29

Robust standard errors are expressed in brackets. Significance is indicated with the following significance levels: *=0.1, **=0.05, ***=0.01.

5. Hotelling model

The regressions above feature three results on which we focus here. First, bigger groups (*ceteris paribus*) pay a lower price. This is consistent with a bargaining model as more customers generate bargaining power for the insurer, leading to lower treatment prices and premiums. Second, in the Dutch situation providers are organized at the regional level. Hence the bargaining model would suggest that groups concentrated in the insurer's home region pay a lower price. However, we find that "nearby" groups tend to pay a higher price than other groups¹¹. Third, an insurer charges a lower price on the individual market if it has relatively many "nearby" group contracts.

We offer a theory of group and individual prices based on spatial competition on an Hotelling

¹¹Another possible theory that explains higher prices would be that hospitals have all the market power and that insurers with a large market share in a hospital have to pay higher unit prices for hospital services than insurers with a smaller market share. As explained in section 3 this theory contradicts the empirical finding that a large market share in a hospital in general leads to lower unit prices (NZa, 2009).

beach. We show that this model can account for the three results from our regressions above. Moreover it allows us to address the normative question: under which conditions are all customers (both in group and individual contracts) better off with the introduction of group contracts.

The intuition driving the model is the following. We assume that when deciding on group contracts, the median voter is pivotal in making the choice between contracts (two in this case). Although it is not obvious that group decision making is well described by a median voter model, it is a reasonable assumption to make. To illustrate, an employer may want to choose the contract that is preferred by the majority of its employees. Recall that in the Netherlands the employer contribution to health insurance is independent from the (group or individual) contract chosen by its employees. Hence there is nothing to gain for the employer by choosing a contract that is disliked by the majority of its employees.

When bidding for a group contract concentrated in its home turf, an insurer knows that the median voter in this group is biased in favor of its contract. Hence it can offer a relatively high price and still win the contract. With groups that are scattered over the country or when an insurer does not have a home turf, the median voter is harder to convince which leads to a lower price for the contract.

Similarly, when a group increases in size by spreading out geographically, the median voter tends to move away from the insurer. This ensures that the insurer has to offer a lower price to win the group contract.

Finally, prices for individual contracts are determined by the ratio of inframarginal over marginal consumers. Nearby contracts reduce the number of inframarginal customers thereby leading to lower individual prices.

5.1. Group contracts

To formalize this intuition, consider the Hotelling beach in figure 1 with travel costs t and length 1. Two insurers I_a, I_b are located at the far left and right sides of the beach resp. Both insurers have identical constant marginal costs equal to c .¹² The travel costs t capture the regional orientation of the Dutch insurance markets. Before the reform, sickness funds were organized at the regional level. As discussed in section 2 people in a region formerly serviced by a sickness fund, tend to stay with that sickness fund. This is captured in the following way. A consumer at distance $x \in [0, 1]$ away from I_a values the disutility of buying insurance from I_a at price p_a as

$$p_a + tx$$

and for I_b at price p_b this expression becomes

$$p_b + t(1 - x)$$

Note that we can ignore the value of insurance itself since it is the same for both insurers (and both individual and group contracts). Further, buying basic insurance is mandatory in

¹²In a bargaining model this cost would be endogenously determined by provider-insurer bargaining over treatment prices. However, we claim that the results presented in the previous section are consistent with a model with exogenous costs.

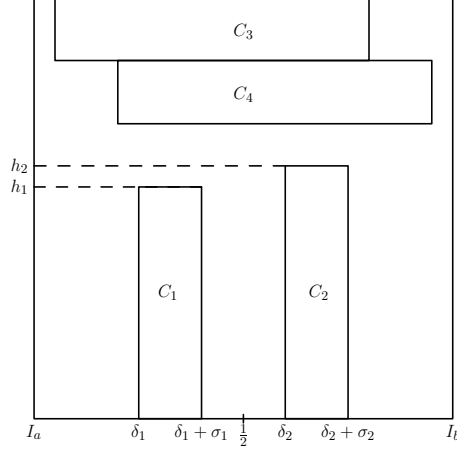


Figure 1: Insurance market with 2 insurers, I_a, I_b , two “nearby” contracts C_1, C_2 and two other group contracts C_3, C_4 .

the Netherlands hence we also do not need to consider whether a consumer values insurance enough to buy it in the first place.

The consumer indifferent between buying from I_a and I_b lives at a distance \bar{x} from I_a :

$$\bar{x} = \frac{1}{2} + \frac{p_a - p_b}{2t} \quad (5.1)$$

Hence even if $p_a > p_b$ there are still people close to I_a (that is people at a distance $x \in [0, \bar{x}]$ away from I_a) that keep on buying insurance from I_a . This captures the regional bias mentioned above.

Consumers are uniformly distributed over the beach with density 1 (hence total mass of consumers is normalized to 1). We consider four group contracts on the Hotelling beach: C_1, C_2, C_3, C_4 .

Group C_1 is a “nearby” group for insurer I_a . The consumer of C_1 closest to I_a is a distance δ_1 away from I_a ; the consumer furthest away is located at $\delta_1 + \sigma_1 < \frac{1}{2}$. The density of C_1 is denoted by h_1 . Hence the median voter of C_1 is located at $\delta_1 + \frac{1}{2}\sigma_1$. The best offer that I_b can make to the median voter is a price equal to c and hence the median voter’s disutility from buying I_b ’s contract equals $c + t(1 - \delta_1 - \frac{1}{2}\sigma_1)$. A price equal to (or slightly below)¹³

$$p^{C_1} = c + t(1 - 2\delta_1 - \sigma_1) \quad (5.2)$$

makes sure that I_a wins this group contract.¹⁴

¹³If insurers first set individual prices and then group prices, it may be the case –due to the max. discount of 10%– that $p^{C_1} = 0.9p_a^i$ where p_a^i denotes the individual price of insurer I_a . We ignore this possibility as the 10%-constraint is not binding for most group contracts in our data.

¹⁴Assuming that $p^{C_1} < p_a^i$ where I_a ’s individual price is determined below. If this is not the case, then customers in C_1 will buy the individual contract. Comparing equations (5.2) and (5.10) below, this condition boils down to $1 - 2\delta_1 - \sigma_1 < 2F^i/f^i$. If this condition is not satisfied, I_a offers the group C_1 the individual contract.

The consumer closest to I_a in group C_2 is at a distance δ_2 from I_a and hence distance $1 - \delta_2 < \frac{1}{2}$ from I_b . The median voter in C_2 is at a distance $1 - \delta_2 - \frac{1}{2}\sigma_2$ away from I_b . Similar reasoning as above gives us:

$$p^{C_2} = c + t(2\delta_2 + \sigma_2 - 1) \quad (5.3)$$

Finally, consider the two groups that are not clearly in either insurer's home turf: C_3, C_4 . Distance from I_a to C_3 's closest consumer is δ_3 and the median voter is at a distance $\delta_3 + \frac{1}{2}\sigma_3 > \delta_1 + \frac{1}{2}\sigma_1$ from I_a . As drawn in figure 1 (in particular, $\delta_3 + \frac{1}{2}\sigma_3 < \frac{1}{2}$), the same reasoning as above gives¹⁵

$$p^{C_3} = c + t(1 - 2\delta_3 - \sigma_3) \quad (5.4)$$

and similarly with $\frac{1}{2} > 1 - \delta_4 - \frac{1}{2}\sigma_4 > 1 - \delta_2 - \frac{1}{2}\sigma_2$:

$$p^{C_4} = c + t(2\delta_4 + \sigma_4 - 1) \quad (5.5)$$

First, consider the difference in price paid by a nearby group and a group that is not clearly in an insurer's home turf. Here we do the comparisons for I_a , but clearly by symmetry the same results hold for I_b . The nearby group pays a higher price: $p^{C_1} > p^{C_3}$. Because the median voter of C_3 is further away from I_a than the median voter of C_1 , it is easier for I_a to convince group C_1 to buy its group insurance. Hence it can charge C_1 a higher price than C_3 and still win the contract.

Our second finding in the empirical analysis is that bigger groups pay a lower price. Since increasing the density of a group by raising h_i ($i = 1, 2, 3, 4$) does not affect the position of the median voter, it has no effect on the price paid by the group. In our model bigger groups pay a lower price, if the group size is increased by adding customers to the group that are more price sensitive than the median voter (*i.e.* that are further away from the insurer). One way to formalize this for group C_1 is to consider an increase in σ_1 . Indeed, it follows from equation (5.2) that $\frac{\partial p^{C_1}}{\partial \sigma_1} < 0$. Hence our explanation for the observation that bigger groups pay a lower price is that in bigger groups, *ceteris paribus*, the median voter is further away from the insurer that wins the contract.

5.2. Individual contracts

To characterize the individual prices, we first introduce some notation. Let $g_i(x)$ denote the density of group $C_i, i = 1, 2, 3, 4$ at position x :

$$g_i(x) = \begin{cases} 0 & \text{if } x \in [0, \delta_i) \\ h_i & \text{if } x \in [\delta_i, \delta_i + \sigma_i] \\ 0 & \text{if } x \in (\sigma_i + \delta_i, 1] \end{cases} \quad (5.6)$$

¹⁵Here we need two assumptions. First, as above, it must be the case that $p^{C_3} < p_a^i$, otherwise customers in C_3 close to I_a prefer to buy I_a 's individual insurance. But now we also need that $p^{C_3} + t(\delta_3 + \sigma_3) < p_b^i + t(1 - \delta_3 - \sigma_3)$. If this does not hold, customers on the far right of C_3 will buy individual insurance from I_b instead of buying the group contract from I_a . This will –endogenously– reduce σ_3 , thereby shifting the median voter of C_3 to the left. This process stops once a value is found for σ_3 such that $p^{C_3} + t(\delta_3 + \sigma_3) = p_b^i + t(1 - \delta_3 - \sigma_3)$.

For the cumulative distribution function we then have

$$G_i(x) = \begin{cases} 0 & \text{if } x \in [0, \delta_i) \\ h_i(x - \delta_i) & \text{if } x \in [\delta_i, \delta_i + \sigma_i) \\ h_i\sigma_i & \text{if } x \in [\sigma_i + \delta_i, 1] \end{cases} \quad (5.7)$$

The density function of customers for individual contracts can be written as

$$f^i(x) = f(x) - \sum_{j=1}^4 g_j(x) \quad (5.8)$$

where in our case $f(x) = 1$ for $x \in [0, 1]$ as we assume a uniform distribution of consumers over the Hotelling beach of length 1. The cumulative distribution function is then given by

$$F^i(x) = \int_0^x f^i(x)dx = F(x) - \sum_{j=1}^4 G_j(x) \quad (5.9)$$

with $F(x) = x$ in our example with a uniform distribution.

Insurer I_a chooses its price p_a^i for the individual market to maximize

$$(p_a^i - c)F^i\left(\frac{1}{2} + \frac{p_b^i - p_a^i}{2t}\right)$$

The first order conditions for p_a^i, p_b^i can be written as

$$p_a^i - c = 2t \frac{F^i\left(\frac{1}{2} + \frac{p_b^i - p_a^i}{2t}\right)}{f^i\left(\frac{1}{2} + \frac{p_b^i - p_a^i}{2t}\right)} \quad (5.10)$$

$$p_b^i - c = 2t \frac{1 - F^i\left(\frac{1}{2} + \frac{p_b^i - p_a^i}{2t}\right)}{f^i\left(\frac{1}{2} + \frac{p_b^i - p_a^i}{2t}\right)} \quad (5.11)$$

Thus we find that insurer I_a charges a lower individual price ($p_a^i < p_b^i$) if and only if

$$F^i\left(\frac{1}{2} + \frac{p_b^i - p_a^i}{2t}\right) < 1 - F^i\left(\frac{1}{2} + \frac{p_b^i - p_a^i}{2t}\right) \quad (5.12)$$

Since we assume a uniform distribution F , this inequality holds if insurer I_a “looses” more customers due to group contracts on its individual market. Evaluated at $p_a^i = p_b^i$, this would be the case if

$$\sigma_1 h_1 + G_3\left(\frac{1}{2}\right) + G_4\left(\frac{1}{2}\right) > \sigma_2 h_2 + \sigma_3 h_3 - G_3\left(\frac{1}{2}\right) + \sigma_4 h_4 - G_4\left(\frac{1}{2}\right) \quad (5.13)$$

Hence we have the result that an insurer with many group contracts (among its infra-marginal individual customers) charges a lower price on the individual market. As explained in footnote 9, we cannot identify inequality (5.13) in our data. Hence in section 4 we approximate this inequality by

$$\frac{\sigma_1 h_1}{\sigma_1 h_1 + \sigma_3 h_3} > \frac{\sigma_2 h_2}{\sigma_2 h_2 + \sigma_4 h_4}, \quad (5.14)$$

the percentage of nearby contracts in all group contracts for an insurer. If group contracts are –more or less– distributed among insurers in proportion to their infra-marginal market, this approximation works fine.

5.3. Welfare implications

The Hotelling model above gives a simple explanation for the three results we found in the data. A natural question now is: who benefits from the introduction of group contracts? In the model above, people with a group contract are better off than people with an individual contract, but it may still be the case that everyone (both individual and group customer) is better off with the introduction of group contracts in the health insurance market.

In the model above, if there are no group contracts, both insurers charge the same price¹⁶

$$p_a = p_b = c + t \quad (5.15)$$

Hence the introduction of group contracts leads to a Pareto improvement for consumers if and only if the next two inequalities hold

$$2t \frac{F^i(\frac{1}{2} + \frac{p_b^i - p_a^i}{2t})}{f^i(\frac{1}{2} + \frac{p_b^i - p_a^i}{2t})} < t \quad (5.16)$$

$$2t \frac{1 - F^i(\frac{1}{2} + \frac{p_b^i - p_a^i}{2t})}{f^i(\frac{1}{2} + \frac{p_b^i - p_a^i}{2t})} < t \quad (5.17)$$

Or equivalently (and simplifying notation): $F^i/f^i, (1 - F^i)/f^i < \frac{1}{2}$. In words, it has to be the case for both insurers that group contracts reduce the number of infra-marginal consumers (F^i and $1 - F^i$ resp.) by more than the number of marginal consumers (f^i). The intuition for this is straightforward. When considering to increase its price, an insurer faces the following trade off. A higher price leads to higher profits over “existing” (or infra-marginal) consumers but reduces the number of consumers at the margin. To the extent that group contracts reduce the former number of consumers more than the latter, the insurance premium falls on the individual market. Since people in a group contract are better off than people with an individual contract, everyone benefits from the introduction of group contracts in this case.

To illustrate this with the example above, consider the case of a symmetric equilibrium ($p_a^i = p_b^i$). Then prices on the individual market are lower with group contracts (than without) if and only if

$$\frac{F^i(\frac{1}{2})}{f^i(\frac{1}{2})} = \frac{\frac{1}{2} - \sigma_1 h_1 - (\frac{1}{2} - \delta_3) h_3 - (\frac{1}{2} - \delta_4) h_4}{1 - h_3 - h_4} < \frac{1}{2}$$

or equivalently

$$\sigma_1 h_1 > \delta_3 h_3 + \delta_4 h_4$$

An increase in σ_1, h_1 and a fall in δ_3, δ_4 reduces the number of infra-marginal consumers on the individual market. An increase in h_3, h_4 reduces the number of consumers at the margin where insurers compete on the individual market.

In the Netherlands, policy makers tried to increase the spillovers from the group market to the individual market by stipulating that the price difference between the two types of contracts should be below 10%. The analysis above suggests another way to maximize spillovers from

¹⁶This follows from equation (5.10) with $p_a = p_b = c + 2tF(\frac{1}{2})/f(\frac{1}{2}) = c + t$ for the uniform distribution.

the group to the individual market. Group contracts should affect infra-marginal consumers more than marginal consumers. In the Dutch context where historically most insurers have a home region, this implies stimulating group contracts that are concentrated in a geographical sense. That is, an employer with a clear regional focus is a better group contract (with an eye on spillover on the individual market) than a contract for all people playing tennis the Netherlands.

6. Discussion and conclusions

In 2006 the Dutch health insurance system has been profoundly reformed towards a system of managed competition. The main idea of the market reform was to increase the possibilities for insurers to improve quality and reduce costs of health care delivery. Health insurers obtained therefore several tools to manage care. One of these tools is group contracts which may enable health insurers to exert stronger bargaining power versus health care providers.

The goal of this study is to explain the factors behind the premiums of different group contracts. Our estimation results show that some well-known factors such as the generosity of the insurance contract, whether an insurer sells other types of insurance, and the ownership status of an insurer are important determinants for the price of a group contract. The main idea of the study was to find out whether the effect of a group contract on an insurer's bargaining vis-a-vis providers leads to lower prices for group contracts. Our presumption was that health insurers can extract discounts from providers more easily with "nearby" contracts; that is, groups concentrated within an insurers home turf. This would be consistent with the bargaining argument in the literature, which states that groups create bargaining power for an insurer with local health care providers such that the insurer can give a discount to the group.

However, we find that groups that are located in an insurer's home turf tend to pay a higher price for their group contract than groups which are more spread out over the country. This is inconsistent with the bargaining story above. Although it is possible that insurers are able to bargain somewhat lower prices due to a large market share in a hospital, we find that this possible effect is dominated by a competition effect that redistributes possible bargaining gains to more price sensitive groups. We present a simple Hotelling model that is consistent with three main findings from our empirical analysis. First, "nearby" groups pay a higher price than other groups. Second, bigger groups tend to pay a lower price. Third, an insurer with relatively many "nearby" contracts, charges a lower price on the individual market. Our model shows that in some cases lower prices in the group market spill over to lower prices for the individual market. Regional groups that mainly reduce the number of infra-marginal consumers tend to reduce prices on the individual market. Groups spread across regions reduce the number of price sensitive consumers at the margin of the individual market. This tends to raise individual prices.

Managed care and selective contracting has not yet materialized in the Netherlands. Health insurers in the early years after the reform may have managed to bargain treatment prices somewhat down, but certainly not to the extent that are reported in the US-literature in which managed care organizations lower costs with 10-20 percent compared to indemnity insurance

(Getzen, 2007). Health insurers have just begun to invest in managed care activities. It is likely to take several years before they are able to bargain more aggressively with providers which have market power in the Netherlands.

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