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**SCHOOL OF BUSINESS, ECONOMICS AND LAW**

Master Degree Project in Economics

## **Political Process and its Effect on Price**

Analysis of the effect of price setting process on public dental prices in Sweden

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## **Abstract**

Since the deregulation of prices in 1999 discrepancies in prices for public dental care exist across counties in Sweden, which cannot only be attributed to differences in cost. The political process differs across counties and this paper explores the possibility that the complexity of the political processes in a county has an increasing effect on prices for public dental care. The results show a positive correlation between the number of political steps in the price setting process and public dental prices. Further these public prices have a positive correlation with private prices, showing an effect that carries across into all actors within the Swedish dental care market. Therefore, it is proposed that a delaying organizational strategy can reduce prices for both public and private dental providers and thus reduce cost for the end consumer.

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## 1. Introduction

Prices within the Swedish dental healthcare market vary significantly from county to county, and between public and private practice. The differentiation between private and public companies is not surprising, due to the requirement for public companies to use a cost-based pricing strategy. Cost-based pricing, as stated by Municipality law, states that counties are not to set prices higher than the minimum required to cover their costs (1990:900, ch. 8 §3c). The Dental and Pharmaceutical Benefits Agency sets a reference price that is based on an average of costs per procedure, which is used as the basis for federal compensation and further exists as a baseline for what procedures cost and as a reference point for consumers. Since public companies are required to use cost-based pricing, it can be expected that the reference price will be highly correlated to the price charged by public dental providers across all counties in Sweden. While private providers can be expected to have higher prices than public providers, since they do not have to abide to the cost base principle, they are however competing on the same market and their prices can therefore be expected to correlate. Furthermore, since the reference price represents an average cost this will also heavily be represented in the private prices.

With these assumptions in place, it would be expected that the level of differentiation from county to county and between public and private pricing would be modest in nature. However, as can be seen in previous research, this does not appear to be case (KKV, 2013:10 & Eriksson R. , 2004) “There is a very large dispersion in prices among county councils as can be seen from the minimum and maximum values of price changes” (Eriksson R. , 2004, p. 4). See table A1-A4 in appendix A for graphs showing these prices differences across county prices. Though differences in common costs, i.e. salary, rent etc, can explain some differences, Eriksson (2004) questions whether the large price discrepancies between counties is fully explained by differences in costs, and further brings up that the National Social Insurance Board deems this unlikely.

Since public dentistry is cost-based, in order to understand what additional attributes affect the variation of prices from county to county, it is logical to analyze what additional elements could be contributing to increased costs for each county. Within organizational theory, it has been recognized that overly complex structure, evidenced by numerous steps and authorities

(hierarchical layers), has the potential to deter responsiveness, delay implementation, and increase costs, (Shaw & Schneier, 1998). While, some costs are unavoidable and dependent on situational factors, e.g. rent, salary, it is worth researching if some costs are influenceable, and reflective of potentially unnecessary procedural elements. It is from a delayering perspective of organizational theory that we suspect political process could be a significant influencer of county price differences. Therefore, *the purpose of this study is to see if a significant correlation exists between the number of political steps in the process of price setting and the price of the procedures, not only in reference to public providers but transversely to private providers.* In order to examine this relationship the procedures for price setting are researched by county, via both qualitative and quantitative methods.

Under the assumption that increasing hierarchical levels has the potential to increase the costs within the counties our hypothesis is that:

**H<sub>1</sub>: The number of political steps involved in the price setting process will have a positive correlation with public prices and transversely with private prices.**

### **1.1 Results and contribution**

Since price discrepancies among prices for public providers started to arise after the deregulation of pricing for dental care there has been a discussion on the origin of these. In this paper we present a new way of analyzing the variations across counties using political steps in the price setting process for public providers as a proxy for a potential overly complex political organizational structure. Costs can be related to such a structure and consumers would benefit from having these additional costs removed. Our results show that there is a correlation between more political steps in the decision process and a higher price for public providers. These higher public prices transverse to higher private prices and total higher prices for end consumers. Therefore the application of a delayering organizational strategy by counties can potentially lower the price for consumers.

## 2. Background

In order to gain a detailed understanding of the research premise, three primary areas will be discussed, i.e. price history, dental care market characteristics, delayering perspective in organizational hierarchy and Competitive aspects of the dental care market contribute by providing insight into how private and public providers behave. It is important to fully grasp the structural foundations and legal requirements that influence the pricing process within the Swedish dental market. Finally, it is through the addition of an organizational delayering theoretical perspective, that a new way of analyzing the current situation is possible.

### 2.1 Price History 1999-2014

Before 1999 the state set a ceiling for what dental practitioners could charge for procedures. This price ceiling tended to be a norm instead of the intended maximum price, and in addition the price ceiling system was also slow to adapt to changes in costs. These, among others, negative aspects of the price ceiling led to the deregulation of prices under the dental care reform of 1999. (The Swedish Government, 1998).

The deregulation of prices allowed discrepancies between actors on the market. A rapid steep increase in prices was considered a risk when deregulating pricing in 1999. However, by having the counties abide by the cost based principle, it was believed that the counties would set a low price and therefore control the increase in price via competition (The Swedish Government, 1998). The prices did rise at a steep rate with a total rise of 71 % 1998-2006, however the increase was at its highest right after the reform when prices rose 16 % in 1999, but leveled off to 3.1 % in 2005 (SOU, 2007:19). If separating public dental services and private dental service the increase in price was 13 % for public and 21 % for private in 1999 (Eriksson R. , 2004).

The current dental care subsidies in Sweden were adopted 1 July 2008 with the purpose of contributing to the general aim of the Dental Health Care Act, which is to maintain good dental health and provide it in an equitable way among the entire population. This was to be better achieved by expanding in the area of preventive measures and providing individuals with costly dental care needs the possibility of treatment at a reasonable cost (RiR, 2012:12). The subsidy, which includes all Swedish residents over 20 years of age, takes form of three steps: A general dental care subsidy, a high cost protection and a special dental care subsidy (SSIA, 2008).

For all procedures included in the dental care subsidy there is a reference price produced by The Dental and Pharmaceutical Benefits Agency (TLV). The reference price functions as a basis for compensation within the dental care subsidy, and in addition acts as a price comparative tool for patients. The reference price is cost based and calculated from required time per procedure, material, and indirect cost i.e. rent, cleaning etc. (TLVFS, 2013:2). Furthermore, the reference price acts as a ceiling for compensation. If the dental care provider charges a price above the reference price, the difference is to 100 % covered by the patient. If the provider charges a lower price, that price is what will be compensated (TLVFS, 2013:2).

One reason that dental care provider's prices often exceeds the reference price is that different materials can have higher cost than the standard material used to calculate the reference price. However, it's unclear to what extent this might cause the providers prices to exceed the reference price (RiR, 2012:12). Providers can consult with patients to choose a different material than the one used in calculating the reference price, however, the level of compensation is not affected and will still only reach the maximum allowed according to the reference price (TLVFS 2013:2).

## **2.2 The Dental Care Market**

The dental health care market is primarily controlled by the Dental Care Act (1985:125), which regulates parts of the dental industry e.g. that the county should plan the dental care provision based on the demand of the population (1985:125 §8) . The Swedish Dental Service (SDS), a publicly managed company, is one type of actor present on the market along with private providers of dental service. The SDS has been assigned special responsibilities, by the Dental Care Act, and are required to provide dental care for children and youths till the year they turn 20 years of age, specialist dental care for adults and dental care for adults that the county sees appropriate (1985:125 §7)

A study performed by the Swedish Competition Agency (KKV. 2013) observed that private firms and clinics have the largest share of the dental market, registering 60 percent of the total amount of treatments performed versus the 40 percent that is registered at the Swedish Dental Services. The largest private actor on the market is Praktikertjänst that performs one third of all adult dental health care treatments in Sweden. The total number of SDS providers is 21; 20 out of these 21 are owned and managed directly by the county, with the last being owned by the

region of Gotland, which is a municipality. The guideline through which a county is able to own and manage a company, such as a dental health care provider, is regulated by the Municipality law (1991:900).

Even though free pricing exists on the dental health care market, since the reform of 1999 mentioned earlier, additional influences on the price setting process exists. A paragraph in the Dental Health Care Act (§4) states that a care provider can collect payment for examination and treatment. The payment should be reasonable considering the nature of the treatment, extent, performance and other circumstances. The publicly owned Swedish Dental Services, in contrast to private clinics, has to follow the Municipality law (chap 3. §1 & §9) which states that the County Council in each county is the highest decision-making political body responsible for matters of principle, as well as other economical questions concerning companies that the county owns. This means that if the SDS wants to change their prices, their proposal has to go through and be presented throughout their county's political system before the final decision of the County Council. This political pathway from the Swedish Dental Services differs depending on which county is observed, although there are some common traits between the counties. For instance all counties have a county executive board that is the political body right before the County Council.

Further, the counties are restricted by the cost base principle that the county cannot collect higher payment than what corresponds to the service (1991:900 chap. 8 §3c). The cost base principle allow for some leeway as it targets the total cost of a public activity, and thus prices for an individual procedure can lie above its cost but on the whole the prices for dental care should be set to avoid economic surplus (The Swedish Government, 1994). The county is also obligated to charge the same price over the entire county according to the equality principle in the municipality law (1991:900). This has the effect that prices can be set in order to create a level of cross-subsidizing, so that some geographical areas subsidize others and the price therefore does not correspond to local cost (SOU, 2007:19).

### **2.3 Delaying strategies**

The history and regulation connected to the dental market and county governance, creates a situation where political bodies, e.g. the public companies board, arbetsutskott, tandvårdsutskott,



county councils etc., for each county are required to determine what dental prices will be applied by public providers in their county. The number, title and role of political institutions and bodies associated with this process differ among counties, for a comprehensive comparison refer to table A6 in appendix. This variation represents aspects of county organizational structure, which can be viewed in a similar way to traditional corporate hierarchical systems.

It is considered an established ideology that the number of management layers, or in our case political steps, involved in the decision making process can directly affect responsiveness, efficiency and ultimately cost, (Shaw & Schneier, 1998). It is important to note that Shaw & Schneier (1998) acknowledge that value can be created with the addition of managerial layers and that no optimum number of hierarchical steps exists. According, to their research, the true test for excessive layers is based on whether each managerial stage adds some value to the process (Shaw & Schneier, 1998). However, the evaluation of the value added, or the necessity of the various political steps involved in each communities pricing policies, is too vast to be covered within the scope of this research.

Instead, the primary perspective of this research that is relevant is their argument that the application of excessive managerial levels has the potential to result in increased cost, due to characteristics such as: increased bureaucracy, less accountability, inward focus, and decision makers being too removed from day-to-day, excessive reviews, and distorted communication, (Shaw & Schneier, 1998). Since the political hierarchical steps connected to pricing policies of communities is distinctly different among counties, it is worthy of exploring whether or not this variation has a correlating relationship with the resulting price variations.

## **3. Method**

### **3.1 Choice of methods: Qualitative and Quantitative**

The main aim of this thesis is to explore if variations in the political organization could lead to variations in public prices and if that variation in hierarchical layering could transvers into the variation in price discrepancies between private prices and public price in different counties. To do this we performed quantitative analysis on secondary data. However, mixing the quantitative research approach with a qualitative one might help us explore pricing and it's determinants at a greater depth (Muijs, 2011). In addition to analyzing secondary data we therefore performed several interviews with the aim of examining how the political system works and to examine what kinds of political factors might affect the prices set by the Swedish Dental Services. This allowed us to find appropriate instruments to represent political organizational aspects when studying price correlation between public and private actors. One of the advantages of performing interviews is that it gives the researcher an opportunity to learn of the complexity of the business-related phenomena in its core context. This makes it a good complement to quantitative research which dominates the body of scientific work in social sciences (Eriksson & Kovalainen, 2008). For the interviews we constructed a questionnaire that was similar for all counties and types of respondents. This was done in order to help us collect answers that could be compared and analyzed more easily, the questionnaire can be found in appendix B, in both a Swedish and English version.

### **3.2 Sampling & Data Collection**

Due to time constraints, eleven out of twenty-one counties were interviewed providing a representative sample of Sweden, both geographically and demographically. The goal was to interview two different actors from each county: one individual representing the political side of pricing, preferably a politician with insights into dentistry, and one individual representing the Swedish Dental Services, preferably a manager involved in the pricing process. Since The Swedish Dental Services could be managed in two different ways, either as a public administration or incorporated company, we wanted our interview sample to contain both types of management forms in order to see if there were any differences between the two. Nine of the interviewed counties had a public administrated Swedish Dental Service and two of them were incorporated companies. The interviews were primarily conducted over the phone, due to time constraints and distance. Three of the interviews were conducted face to face, here in

Gothenburg. A survey was constructed to email to the remaining counties, which could not be scheduled for phone interviews, containing a limited number of questions that pertained to the most interesting aspects accumulated from the other interviews. Three-to-four individuals in each county were emailed in order to maximize the response rate. In order to obtain information from the counties that didn't respond to interview requests, protocols from different political meetings, together with organizational schemes found on the counties own webpages, were utilized.

### **3.2.1 Interviews – collection of own data**

The most interesting aspect obtained from the interviews conducted with representatives from the 11 counties, and the surveys, was the differing political steps surrounding the dental price setting process when comparing the counties. For instance, some County Councils have delegated the responsibility to decide on the prices to other bodies within the process. The municipality law (ch. 3 §12) states that the County Council can delegate a decision like this, if a clear framework exists that the assigned decision maker has to follow. If the changes in the prices do not fit inside the framework, the final decision is referred back to the County Council. The most common framework that decision makers are given is to follow the reference prices provided by TLV. This delegation aspect raised the question: whether or not all counties who have decided to follow TLV reference prices have a shorter political path, or if that also varies? Some counties following TLV have a shorter path, like Dalarna and Västerbotten. The boards, in those counties, responsible for the SDS are allowed to make the decision to continue to follow the reference prices. However, other counties, that strictly follow TLV, have the same path as prior to the decision of following the reference prices. From these questions we created the variable *politicalsteps*, which we think will be interesting to analyze, as it shows the number of political instances that a new dental price proposal goes through in the county. Based on the assumptions connected to delaying organizational theory, as outlined by Shaw and Schneier (1998), we would suspect that those counties with shorter paths would be able to respond quicker to changes in reference prices, arguably helping them to respond more similarly to the rate at which private clinics are able to react. Also this shorter path could decrease the decisions making process, making their organization more efficient and increasing the possibility to compete with the private actors (KKV, 2013:10). This assumption of increased efficiency is similarly argued for under the delaying organizational theory and is further connected to a lowering of administration costs that, in this case, has the potential to lead to lower prices (Shaw and Schneier, 1998). There are also tendencies that private actors adjust their prices twice a year,

once when the reference prices change and again when the SDS adjusts to these changes in January (RiR, 2012:12). If a shortened political path could lead to SDS changing their tariffs immediately following the reference prices changes this could lead to private providers only adjusting their price once a year, which has the potential to decrease price disparity.

### **3.2.2 Quantitative Data description**

The primary data are trimmed actual prices charged for each dental care procedure on a clinic level in each county, as reported to the SSIA, for the first quarter of each year in the period of 2009-2013. This price data originates from when the dentists report to the SSIA of all the procedures performed and the prices charged for each patient. Reporting this is to make the patient eligible for receiving reimbursement from the dental care financial support system.

The reason for why the prices that we analyze are the trimmed actual charged instead of the reported actual charged price is due to some very extreme and unlikely outliers are found in the data; one dentist has reported charging 113 million SEK for a procedure with a reference price of 210 SEK. This seems more like an reported error than an actual charged price, so reported prices higher than ten times over the reference prices for that actual year are trimmed to have the value of exactly ten times over the reference price.

The dataset is considered panel data covering all clinics in the country over several years of time. Actual charged prices are used instead of listed prices since there could be deviations between the actual charged price that the patient faces and what is stated in the official pricelist. For instance, the SDS uses what is called latitudes within procedures for different severity of the procedure which might leads to the dentist charging a higher or lower price than what the price list states (Grönqvist, 2012). Table 1 below specify the data sources and the definitions for the variables used in the analysis.

The price data covers the first quarter each year since counties change their prices once a year, in most cases January 1<sup>st</sup>, or in the fall right after TLV have published the changed regulations regarding the Dental Care Benefits plan containing updated reference prices. Private providers tend to update their prices twice a year, once with the release of the new reference prices and again when the respective county updates the prices. Thus during the first quarter of the year all providers have adapted to the reference price and the private has adapted to the public prices

(KKV, 2013:10). The trimmed private price will be the dependent variable in the regressions that are performed. The trimmed public price and the reference price will be the independent variables. Further, an interaction term with year and reference price is also included to control for changes in the reference price.

Table 1: Shows the variables used in the regressions and the sources of these variables

| Variable   | Definition   | Source   |  |
|--|--|--|--|
| <b>Dependent variables</b>                                       |  |  |  |
| <i>log_private_price,</i><br><i>private_pack1, private_pack2</i> | Private prices. The mean trimmed charged price at a clinic level for each dental procedure or the mean price charged for package 1 and package 2 at a clinic level<br>Transformed into logarithms. | SSIA   |  |
| <b>Independent variables</b>                                     |  |  |  |
| <i>log_ref_price, ref_pack1,</i><br><i>Ref_pack2</i>             | The yearly reference price that is the base price within the dental care subsidy scheme, transformed into logarithm. For each procedure analyzed and the two packages 1 and 2.                     | TLV  |  |
| <i>log_county_price,</i><br><i>public_pack1, public_pack2</i>    | The mean trimmed price charged by The Swedish Dental Services for each dental procedure and the two packages for each county and each year.<br>Transformed into logarithm.                         | SSIA   |  |
| <i>year*referenceprice</i>                                       | Year variable interacted with the reference prices, to control for the yearly change   | SSIA   |  |
| <b>Instrument variables</b>                                      |  |  |  |
| <i>pol_maj (Right, Joint, Left)</i>                              | The variable indicating which political affiliation that have majority in each county, divided into three dummy variables: Taking the value 1 if Joint, Right or Left, and 0 otherwise             | SALAR  |  |
| <i>taxratecounty</i>   | The county tax rate for each county in percentage  | Statistics Sweden  |  |
| <i>Public_adm</i>  | A dummy variable for management form of The Swedish Dental Services in each county, taking value 1 if public administration and 0 if corporation   | Interviews, surveys                                      |  |
| <i>politicalsteps</i>  | The total amount of political bodies the pricelist proposal passes before the final decision is made; the final step is mostly the County Council.   | Interviews, survey, and political documents and protocol |  |

| <b>Control variables</b> |   |                   |  |
|--------------------------|---|-------------------|--|
| <i>tertiary</i>          | Share of individuals with university and higher educational level as their highest attained educational level | Statistics Sweden |  |
| <i>log_pop_income</i>    | Mean population income for each country   | Statistics Sweden |  |
| <i>pop_dens</i>          | Number of residents per sq. kilometers  | Statistics Sweden |  |

The control variables shown in table 1 are used to control for factors that might influence variations in demand, between the regions, that might affect prices. Variations in highest attained educational level as well as variations in mean income could influence the prices set by private providers and thus omitting these variable would bias the results. Grönkvist (2012) found that higher education and higher income increases demand for preventive care and prosthetic care and this might influence the prices set. Even variation in population density might influence demand. For instance, lower distances to the nearest clinic might reduce demand whereas higher population density might affect market structure and competition which could increase demand.

### 3.2.3 Choice of procedure and package

Decisions on which treatment procedures and groups of procedures to analyze were made with regards to previous literature, e.g. Grönqvist (2012), as well as frequency of procedures performed yearly collected by SSIA. In addition recommendations were obtained by consulting Bengt Lindén, clinic manager and dentist at Brånemarkkliniken in Gothenburg for. Dr Lindén recommended the list of treatment packages that he and his colleagues at the county of Västra Götaland most likely will use in the future when comparing Västra Götalands dentistry prices with reference prices and the prices of other counties (VGR, 2014). From this list we picked two packages. Further, the choice of individual treatments was made in order to reflect two different types of procedures, preventive treatment, and prosthetics. The reason for this selection is due to the different nature of the two kinds of treatments. The cost of prosthetics is based on specific and more expensive materials whereas the main cost in preventive procedures is labor costs (TLV, 2013). The explanations of the treatments and packages are found below in table 2 and 3.

**Table 2: Explaining the contents of the treatments analyzed and their frequency for year 2012-2013**

| <b>Treatment codes</b> | <b>Treatment info</b>                     | <b>Frequency 2012</b> | <b>Frequency 2013</b> |
|------------------------|---|-----------------------|-----------------------|
| 101                    | Standard examination, by dentist          | 2 634 499             | 2 575 448             |
| 102                    | Complete examination, by dental hygienist | 981 600               | 1 017 522             |

|     |                           |         |         |
|-----|---------------------------|---------|---------|
| 801 | Laboratory prepared crown | 432 584 | 467 504 |
| 804 | Fixed dental prosthesis   | 93 926  | 113 941 |

| Treatment packages nr | Treatment codes       | Content  |
|-----------------------|-----------------------|--|
| 1                     | 101+341+705+706       | Examination and treatment of periodontal disease and two fillings                          |
| 2                     | 101+121+401+801*2+804 | Examination, 1 x-ray, 1 extraction off a tooth and one a fixed dental restoration (Bridge) |

Table 3: The treatments packages being analyzed

The table 4 displays some descriptive statistics, from the dataset used, for the procedures picked to be analyzed in this thesis. It is observed that the mean prices for each procedure differ when comparing public and private providers for all procedures. Furthermore, the amount of clinics covered in the analysis is displayed in the table A5 in appendix. Approx. 80 percent of the clinics are privately managed and 20 are publicly administered.

Table 4: Descriptive statistics for procedures used in the samples

| Procedure | Observations | mean public prices | mean private prices | ref price |
|-----------|--------------|--------------------|---------------------|-----------|
| 101       | 17589        | 685                | 692                 | 658       |
| 102       | 8670         | 604                | 617                 | 607       |
| 121       | 16107        | 47                 | 50                  | 40        |
| 341       | 15074        | 397                | 421                 | 383       |
| 401       | 17239        | 802                | 909                 | 793       |
| 705       | 17347        | 1004               | 1119                | 1002      |
| 706       | 17119        | 1329               | 1559                | 1310      |
| 801       | 16814        | 4916               | 5372                | 4663      |
| 804       | 14436        | 2113               | 2484                | 1995      |
| Total:    | 140395       | 1321,889           | 1469,22             | 1272,333  |

### 3.3 Empirical Strategy

#### 3.3.1 Specification

As mentioned previous both the public prices and reference prices are correlated with the private prices on the dental market. In order to evaluate how they affect private prices we include both of them into our base specification, although, the reference price affects the public price as well making it harder to interpret the relationship. This correlation is likely due to the reference price being calculated to only cover costs, similar costs that both private and public actors face. The

public prices can therefore be expected to correlate to a lesser degree with private prices as the correlation due to common costs will be captured by the reference price. The specification that will be tested contains the dependent variable private price, the independent variables for the *public price*, the *reference price*, and the interaction term *year\*referenceprice* that controls for yearly changes in the reference price. Variable  $X_{it}$  is a vector of control variables, containing the variables of *elementary schooling*, *higher education*, *mean population income*, and *population density* varying on a county level as well as every year. The first two variables control for aspects that may affect the general demand and procedure specific demand as higher education and income shifts demand from reparative to preventive and prosthetic as presented by (Grönqvist, 2012). The population density variable controls for general effects on prices that is related to factors determining price levels in different densely populated areas.

$$privateprice_{it} = \beta_0 + \beta_1 publicprices_{it} + \beta_2 refprice_{it} + \beta_3 year * referenceprice + X_{it} + \varepsilon_{it}$$

Mean trimmed prices are used for the public prices to even out differences in measurement errors and the use of latitudes. Also, all price variables are transformed into logarithms to simplify the interpretation of the results and make them more comprehensible, e.g. a one percent increase in mean public prices will give an expected percentage increase in mean private prices by  $\beta_1$ .

### 3.3.2 Instrument Variables

Since this study aims at examining how hierarchical layering might affect public prices we will instrument public prices using our developed variable *politicalsteps*. This will then predict public prices and the effect will be shown in the first stage of the instrument variable regression. The second stage of the regression will show the effect of the instrumented variable *log\_public\_price* and the additional independent variables on private prices. *log\_public\_price* can additionally be suspected of endogeneity due to the characteristics in the management of The Swedish Dental Services, i.e. there might be factors in the error term,  $\varepsilon_{it}$ , which might affect the public pricing. For instance, laws, regulations, political intentions and process may be in place and public administrations must abide to and could affect public prices, but will not have an effect on private practices.

To control and try to solve for this endogeneity problem we will instrument *log\_public\_price* with additional instruments other than *politicalsteps*. These additional instruments used in the IV



regression to predict *public prices* are *public\_adm*, *pol\_maj*, and *taxratecounty*. Table 1 specifies the natures and source of the instrument variables. This gives the instrument regression:

$$\log publicprices_{it} = \alpha_0 + \alpha_1 politicalsteps_{it} + \alpha_2 publicadm_{it} + \alpha_3 polmaj_{it} + \alpha_4 taxratecounty_{it} + \alpha_5 X_{it} + \varepsilon_{it}$$

These are political variables likely correlated with the decision making process in the counties and thus the public prices, see table 5 for descriptive statistics. The variable *politicalsteps* reflects the amount of political bodies, in each county, that the price proposal goes through including the final decision of the County Council. It is thought that a lower amount of steps indicates a more efficient county organization, which, could imply that the dental care organization also would be more efficient and, thus, might be able to charge lower prices. This is in line with the organizational theory mentioned earlier. The observed minimum amount of steps is 1 and the maximum 5 with an average of 2,6. *Public\_adm* is a dummy variable that equals 1 if the management form of the Swedish Dental Service in that county is public administration and 0 if it is run as a corporation. In Sweden 68 percent of the 21 Swedish Dental Services are run as public administrations and 32 percent as corporations. A corporation could be considered being more efficiently administered than public administered Swedish Dental Services, on the other hand a corporative administered dental care may have a more commercial approach with profit margins. In addition a corporative administration may not use the municipality account system and therefore not benefit from different tax rules and access to funds that public administrations can. This leads us to expect that a corporative administration has a positive effect on price. The variable *Pol\_maj* is divided into 3 dummy variables covering three possible political blocks that could have political majority in the County Council; *right*, *left*, and *joint*. It would be expected that a right majority would have a decreasing effect on prices and a left majority an increasing effect on public prices. In Sweden at the moment almost 50 percent of all County Councils have a right political majority. The effect of county tax rate on public prices is assumed to be positive, this due to efficiency assumption. A lower tax rate would imply a more efficient County Council and this efficiency might be transferred down to the corporation and businesses administered by this county.

Table 5: Descriptive statistics for the instrument variables

| political instrument | observations | mean  | st. dev. | min  | max  |
|----------------------|--------------|-------|----------|------|------|
| Tax rate county      | 411223       | 10.97 | 0.73     | 9.72 | 12.1 |

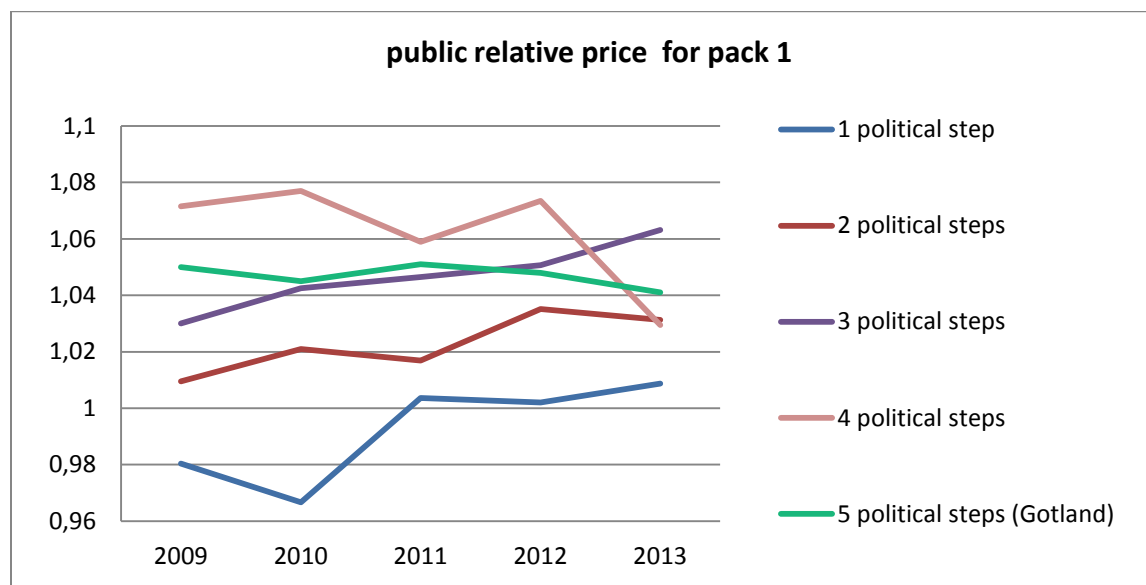
|                                 |        |      |      |   |   |
|---------------------------------|--------|------|------|---|---|
| <b>Political step</b>           | 414343 | 2.64 | 0.92 | 1 | 5 |
| <b>Public administration</b>    | 414343 | 0.68 | 0.47 | 0 | 1 |
| <b>right political majority</b> | 414343 | 0.58 | 0.49 | 0 | 1 |
| <b>Left political majority</b>  | 414343 | 0.27 | 0.44 | 0 | 1 |
| <b>Joint political majority</b> | 414343 | 0.15 | 0.36 | 0 | 1 |

## 4 Results

The aim of this section is to see how the prices for public and private providers behave across counties with different number of political steps in the process of setting dental care prices. This will be shown in graphs and regression results. The prices used in the graphs are relative to the reference price so they are divided by this and thus the value 1 represents the reference price. As mentioned in the methodology section, political steps refer to the number of political bodies a dental care price proposal goes through for public dental care prices. The variables for prices in the regressions are all transformed to log for comprehensive analyses. The coefficient for the variable *politicalsteps* is in level, so the interpretation for this variable is less straight forward.

### 4.1 Results Packages

Graph 1: Table 7: The relative price btw public prices and reference price for each political steps for package 1



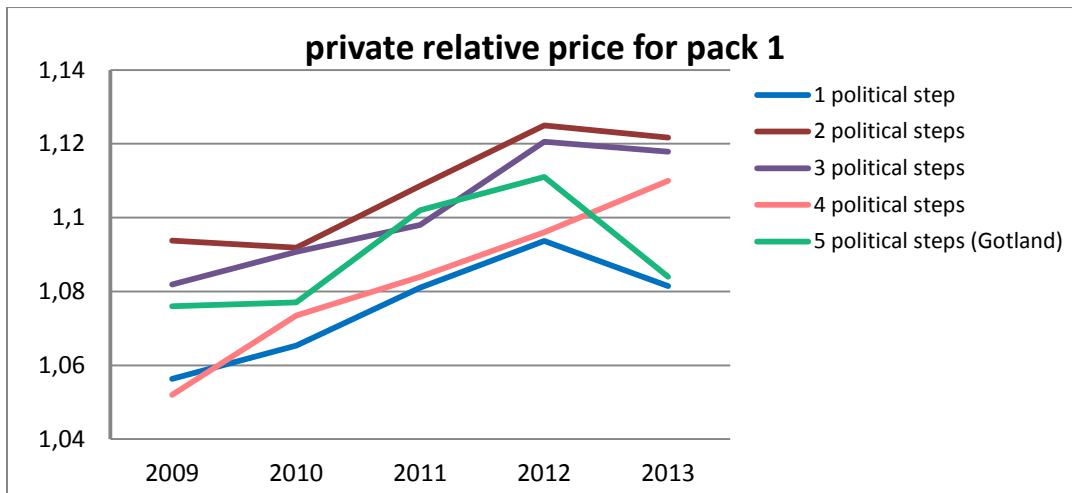
Graph 1 depicts how the prices for public dental providers in counties with different political steps in the process of setting the dental tariffs move over the timeframe studied for package 1 (101, 341, 705 & 706). One political step lies under or very close to the reference price. Two political steps lay 2-4% over the reference price and under higher number of political steps. Three and five steps move together at 4-5% over reference price and four political steps consisting of Halland and VGR has the highest prices.

The first stage of the regression on package 1, table 6, has a positive and statistically significant coefficient for political steps which indicates that the number of political steps in the price setting process has a positive effect on the prices charged by the county. For complete regression results of all instruments see appendix table 7-12. The marginal effect of increasing political steps with one additional political body would be represented by an increase in price by 14.2%. The coefficient for reference price is large and positive and clearly the variable with highest correlation. The marginal effect of increasing the variable ref\_pack1 by 1% on public\_price is 1.56%.

| First Stage Package 1 (101, 341, 705 & 706) |              |
|---|--------------|
| VARIABLES                                   | public_pack1 |
| politicalsteps                              | 0,138711***  |
| ref_pack1                                   | 1,561116***  |

Table 6: first stage of the 2sls, regression on public prices

Graph 2: The relative price btw private prices and reference price for each political steps for package 1



Graph 2 shows the same as graph 1 but with the private dental provider's prices for package 1. Here there is a general upward trend until 2012 for providers in counties of all steps. Private providers in counties with one political step in their price setting process lies lower than providers in counties with more steps. Private providers in counties represented by two political steps have the highest relative price for package 1. The relative private prices for counties with steps three, four and five move between political step one and two, and political step five is the most volatile.

The regression on private prices, table 7, shows negative and statistically significant coefficient for public prices, instrumented with political variables including political steps. The coefficient for reference prices is positive and with a much higher magnitude showing high correlation for private providers as well. Complete regression results are available in appendix table A7-A12.

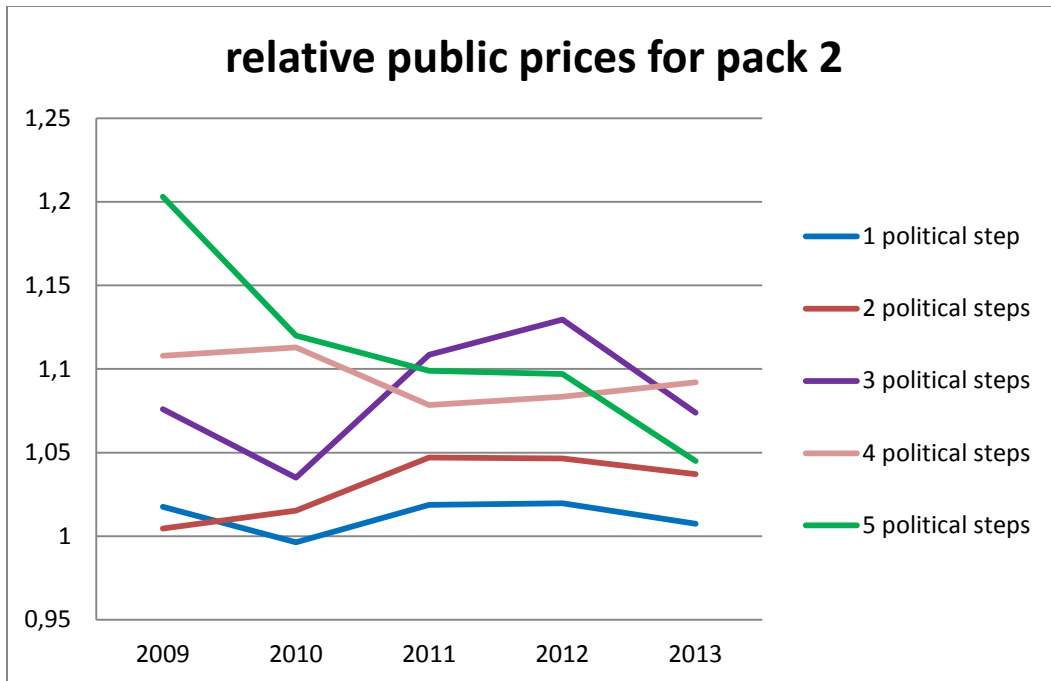
| Second Stage Package1<br>(101, 341, 705 & 706) |               |
|--|---------------|
| VARIABLES                                      | private_pack1 |
| public_pack1                                   | -0.210***     |
| ref_pack1                                      | 1.601***      |

Table 7: second stage of the 2sls, regression on private price

#### 4.1.1 Discussion package 1

Graph 1 (public) shows some tendency that counties with higher number of political steps have higher prices. Private prices seem to react little to public prices in respect of both trend and magnitude for package 1. The exception is counties with one political step where the private providers have the lowest price. The low responsiveness by private providers to public is confirmed by the large gap between the coefficients for public price and reference price in the regression on private prices. In addition, the large coefficient for the reference price in the first stage of the regression on public prices, in combination with the large coefficient for reference price in the second stage of the regression on private prices, indicates that there are little county specific common costs for public and private providers. Furthermore, the graphs points to that the developments of the private prices are different from both the public prices and the reference prices.

Graph 3: The relative price btw public prices and reference price for each political steps for package 2



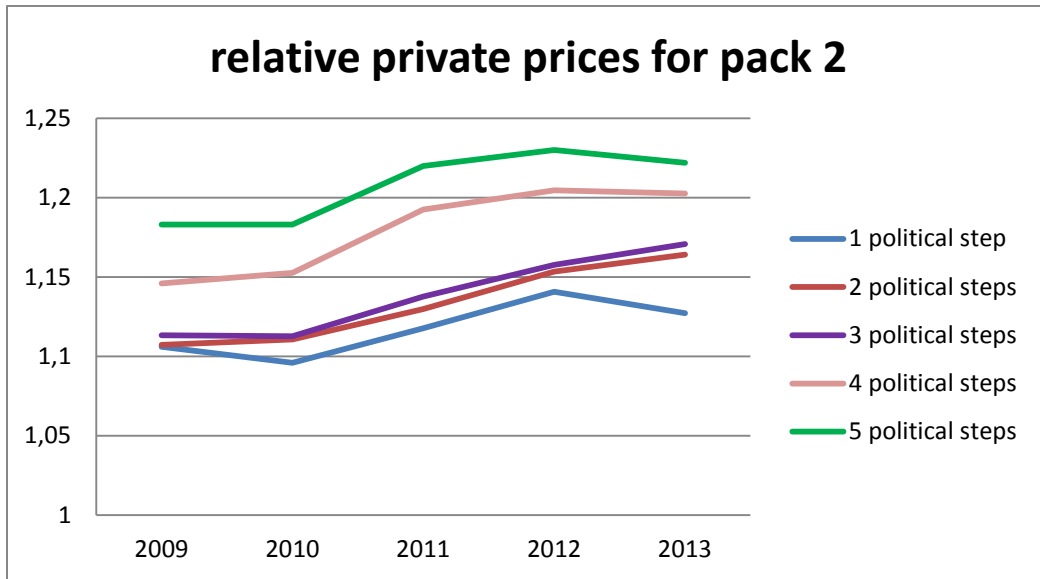
Graph 3 describes the same as graph 1, but for package 2 (101, 121, 401, 2x801 & 804). Again counties with one political step have the lowest price averaging just above the reference price. We also can observe that two political steps lies higher the one political step but lower than the rest. Four political steps lay under five steps, but the downward trend of five steps overtakes four steps in 2013. Relative price for counties with three political steps fluctuates the most and moves from center to top and the down again.

When reviewing the first stage of the regression the instrument political steps has again a positive effect on public prices. The marginal effect of one additional political body in the price setting process is an increase in price by 4.2%. The reference price has also again a very high positive coefficient. An increase of reference price by 1% would correspond to an increase of 1.3% for public prices.

| First Stage Package 2<br>(101+121+401+801*2+804) |              |
|--|--------------|
| <b>VARIABLES</b>                                 | public_pack2 |
| <b>politicalsteps</b>                            | 0,0413507*** |
| <b>ref_pack2</b>                                 | 1,336846***  |

Table 8: first stage of the 2sls, regression on public prices for package 2

Graph 4: The relative price btw private prices and reference price for each political steps for package 2



The respective relative private prices for package 2 are shown in graph 4. For package 2 the private prices move together with the lowest price for one political step and increasing as the number of political steps increases. Private prices in counties with four and five political steps, in setting the public prices, lies high above the reference price in relative terms.

The regression of public price and reference price on private prices for package 2 shows positive coefficients for both regressors (for full regression results see table A7-A12 in appendix). The coefficient for reference prices is lower than 1, so the estimated effect on private prices is less than 1%.

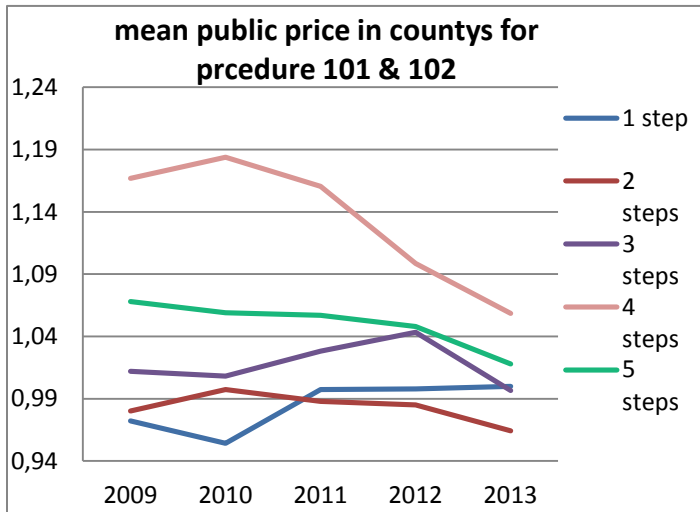
| Second Stage Package2<br>(101+121+401+801*2+804) |               |
|--|---------------|
| VARIABLES  | private_pack2 |
| public_pack2                                     | 0.0676***     |
| ref_pack2  | 0.927***      |

Table 9: 2nd stage of the 2sls, regression on private prices for package 2

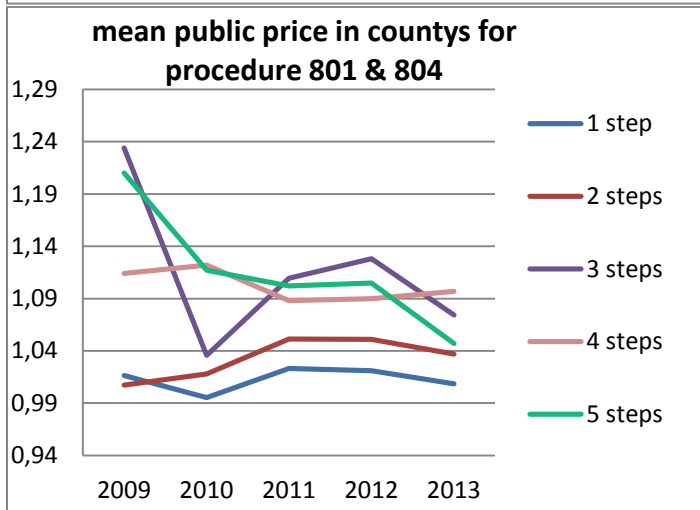
#### 4.1.2 Discussion package 2

Package 2 demonstrates a pattern of increasing political steps in the price setting process results in a higher relative price. The pattern for the private providers strictly follow this pattern and the gap between the coefficients for public price and reference price is lower than for package 1 indicating that the public prices has more of an influence on private prices for package 2. This relationship is also displayed in the second stage of the regression, where the estimated coefficient is positive in comparison to being negative for the public prices in the same stage for package 1.

## 4.2 Results for procedures



Graph 5: The relative price btw public prices and reference price for each political steps for procedure 101 & 102



Graph 6: The relative price btw public prices and reference price for procedure 801 & 804

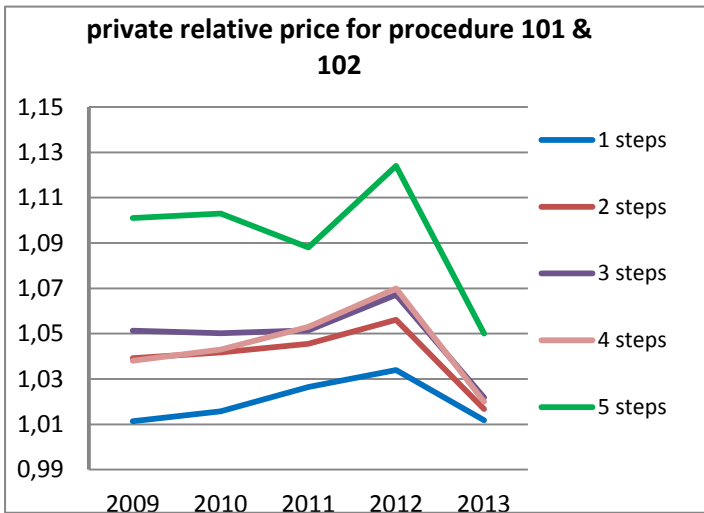
To see if procedure groups behave differently than packages we take a closer look at how two procedures from preventive and diagnostic care and two procedures from prosthetic care behave. For procedure 101 and 102 political steps one and two are close together and below or on the reference price. For procedure 801 and 804, one political step in the price setting process has the lowest relative price and just slightly above the reference price. Two steps lie higher at around 4% above reference price but under the rest, and the motion of the public prices for the two lowest steps seem to be similar. Three political steps lie in the middle for procedure 101 and 102, but changes place from highest to middle place on an almost annual basis for procedure 801 and 804. Four political steps are by far the highest for 101 and 102.



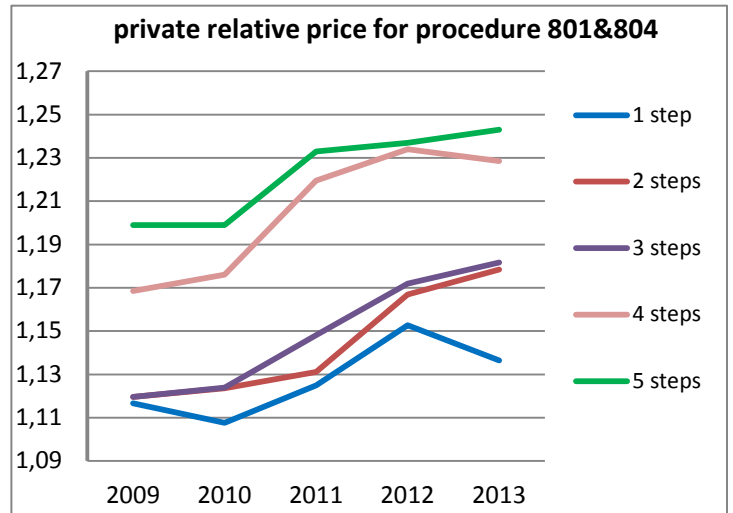
The first stage of the regressions, table 11, on procedure 101 & 102, and 801 & 804, show positive signs for the instrument variable *politicalsteps*. This is consistent with the signage for the same variables when regressing package 1 and 2. The reference price again and consistently shows large positive coefficients.

| First stage of 2SLS    |              |              |
|------------------------|--------------|--------------|
|                        | 101&102      | 801&804      |
| VARIABLES              | public_price | public_price |
| <b>political steps</b> | 0.068989***  | 0.0350093*** |
| <b>ref_price</b>       | 1.444167***  | 0.9927782*** |

Table 10: first stage of the 2sls, regression on public prices for both procedures 101 & 102 and 801 & 804



Graph 8: The relative price btw private prices and reference price for procedure 101 & 102



Graph 7: The relative price btw private prices and reference price for procedure 801 & 804

The relative price for the private providers follows the same positioning for both procedure groups, with an exception of three and four political steps for procedures 101 and 102 where they lie almost at identical price. Private providers in counties with one political step shows prices closest to the reference price followed by two political steps, similar to graphs for package 1 and 2. Gotland with five steps lies high above the reference price on both procedure groups but follows the same trend as private providers in counties with fewer steps and drops in relative price for procedure 101 and 102 in 2013.

The second stage of the 2sls regressions of public price and reference price on private prices is presented in table 12. It shows positive coefficients for both variables. The variables change place as the most dominant between the procedure groups. For procedure 101 and 102 the coefficient for public prices are lower than the coefficient for reference prices but for procedure 801 and 804 the roles are reversed. The coefficient for reference prices has dropped from 0,96 to 0,32 and the coefficient for public prices has increased form 3,7 to 6,3.

| Second stage of 2SLS |               |               |
|----------------------|---------------|---------------|
|                      | 101&102       | 801&804       |
| VARIABLES            | private_price | private_price |
| public_price         | 0.367***      | 0.628***      |
|                      | (0.00300)     | (0.0105)      |
| ref_price            | 0.955***      | 0.316***      |

Table 11: 2nd stage of the 2sls, for procedures 101 & 102 and 801 & 804

#### 4.2.1 Discussion procedure groups

One political step has for both procedure groups as well as for both public and private providers the lowest price. In position this is followed by two political steps that lie above it. Interesting for procedures 101 & 102 is that the instrument political steps for these procedures and the counties of different political steps are more arranged accordingly in the graph. Also, we see that there seem to be two groupings in the two graphs displaying private relative price; for 101 & 102, the four lowest are closer together whereas the line for step five are further away; for 801 & 804 step 1-3 are closer together and step 4-5 move similarly and higher up. This could mean that the private prices are held down by the public prices in counties with fewer political steps and the private prices in counties with more political steps are less correlates less with the public prices. The gap between private prices and the reference price is therefore directly affected by the gap between public prices and the reference price.

#### 4.3 Additional instrument results

The instruments for political majority, administration of the SDS in the county and the tax rate all display statistically significant results indicating that the instruments are valid. The instrument *Public\_adm* shows a consistent negative coefficient showing this variable has a negative effect on public prices. The instruments for political majority *left* and for political majority *right* is positive indicating that joint political affiliation has lower public price. This is consistent except for procedure group 101 and 102 where right political majority shows lowest public price. Finally the instrument *taxratecounty* has a negative coefficient except for procedure group 801

and 804, corresponding to lower public prices with higher county tax rate. For full first stage regression results see appendix table A7-table A12.

#### **4.4 Reference price correlations**

From all the regressions we see that the reference price is highly correlated with both public and private prices, indicating that the costs calculated by TLV for the reference prices are well represents costs faced by both public and private providers for the analyzed procedures and packages. Also, public price is positively correlated with private prices in all the tested regressions besides for package 1. The reason for this deviation could be due to that the procedures in package 1 are less material intense and the cost therefore varies little with the material preferences of the provider. Package 2 consists of 3 procedures within the 800-series and this series of procedures is heavier in material than other procedures analyzed. For this procedure group we see a stronger positive correlation with public prices than with the reference price. The reason for this may be that the preference of material vary less within a county then across and also differs from the material used to calculate the reference price. The graphs also support the notion that the 800-series would deviate more from the reference price. We see that the relative price for private providers is much higher for procedure 801 and 804 and for package 2.

#### **4.5 Difference between private and public**

In order to review the impact of different prices in counties with varying steps in the price setting process for public prices we look at how the difference between public and private prices behave under different political steps. Graph A1 – graph A4 in appendix A shows the difference between public and private prices in counties with different political steps. From the graphs we can see that the difference in counties with one and two political steps is fairly stable over time indicating that private and public providers move together in price changes. Three political steps demonstrate the lowest gap between providers for package 1 and procedures 101 and 102, and this gap between public and private prices is also stable over time. Four and five has an increasing gap, over time, except for procedures 101 and 102. Private providers from these counties also showed the highest prices and as public providers have showed tendencies to converge towards the reference price, private providers in these counties seem to diverge from it. This indicates that in counties with fewer political steps in the price setting process and lower

public prices the private providers follows movements in public prices and reference prices more carefully than in counties with four and five steps. This might be due to that the prices of these providers responds to changes in cost and compete more with the public providers.

#### 4.6 Results from interviews

In the interviews most of the counties answered that one of their main objective with the dental prices was to cover cost, as it is regulated by the municipality law. Some of the counties also mentioned that they had some terms of reference that they had to follow regarding the prices for adult dentistry. For instance Östergötland brought up that the county council, already in 2006, decided that the dental price should follow the national average. The region of Gotland has the intentions to follow the reference price list as close as possible, with some exceptions when it comes to prosthetics since the reference price does not take profit margins of the prosthetic laboratories into account. The SDS in Gävleborg faces a semi-strict decision to follow the reference prices. We here say semi-strict decision since the prices in the county Gävleborg are allowed to vary within 5 percent of the reference price list. Table A 13 in appendix A shows which counties where it is decided politically that their dental prices should follow TLV, with few or no differences, as well as those with a semi-strict decision to follow TLV and the counties with no decision to follow TLV. Halland mentioned that their intention was to follow TLV from year 2015. We see that there is 3 out of the 6 that follows TLV strictly that has delegated the decision to a political body closer to the SDS, this political body is most often the board assigned to oversee and administer the SDS. The counties that do not follow the reference price list use it as a comparative tool, as a guideline and control when analyzing their price levels. If the actual prices set differs much from the reference price list it could indicate that the SDS need to look over their price estimates. In addition interviews revealed that the counties do not consider private prices when setting their prices, but more say that it is likely the private providers that consider and adjust to public prices.

For those counties that follow TLV, there is a lot of work with being as efficient as possible in order to reach a cost level in line with the reference price list. Both representatives from Uppsala and Norrbotten mentioned in the interviews the importance of letting dental hygienists perform more tasks, to reduce the cost, whenever possible. As well as using the time and space as efficiently as possible. When county costs increase more than the reference price, measures are taken to keep costs down with efficiency increases. In contrast, representatives from the region

of Västra Götaland said that their prices reflects their cost for every procedure, and that they believed that it is problematic to follow the reference price list without cross-subsidizing between procedures.

## 5. Conclusion

The correlation between public and private prices, in steps 1 and 2, show that these pricing patterns follow similar curves with both actors indicate lower pricing for end customers. This is in contrast with steps 4 and 5, where private providers pricing shows to be less correlated with the variation in public pricing. It is important to note that, in relation to steps 1 and 2, a more consistent gap in pricing often exists between public and private pricing. This results in not only a lower price for end consumers from both providers but additionally a higher level of competition between the providers, due to public prices being drastically lower and private providers matching price changes.

The variable *politicalsteps* which is used, along with other variables, to instrument public prices is positive and statistically significant for all regressions with some variation in magnitude. The graphs display tendencies that counties with fewer political steps also have lower relative prices. This is particularly noticeable for political steps one and two. Political steps four and five are almost consistently highest in relative price for both public and private providers. Our hypothesis that a higher number of political steps in the price setting process would correspond to higher prices for the public providers and transversely higher prices for private providers would appear to be verified.

These results support the application of a delaying organizational strategy in connection with dental health policies. This implies that a political intention to follow the reference price and manage cost increases through efficiency increases will strongly benefit the consumer by reducing both public and transversely private prices.

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## 6.2 Law Sections

- 1985:125 The Swedish Dental Care Act (Socialdepartementet)

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- 1991:900 Municipality Law (Finansdepartementet K)

<http://www.notisum.se/rnp/sls/lag/19910900.htm>

- 2008:145 Lagen om statligt tandvårdsstöd (Socialdepartementet)

[http://www.riksdagen.se/sv/Dokument-Lagar/Lagar/Svenskforfattningssamling/Lag-2008145-om-statligt-tan\\_sfs-2008-145/?bet=2008:145](http://www.riksdagen.se/sv/Dokument-Lagar/Lagar/Svenskforfattningssamling/Lag-2008145-om-statligt-tan_sfs-2008-145/?bet=2008:145)



## 7 Appendix

### 7.1 Appendix A

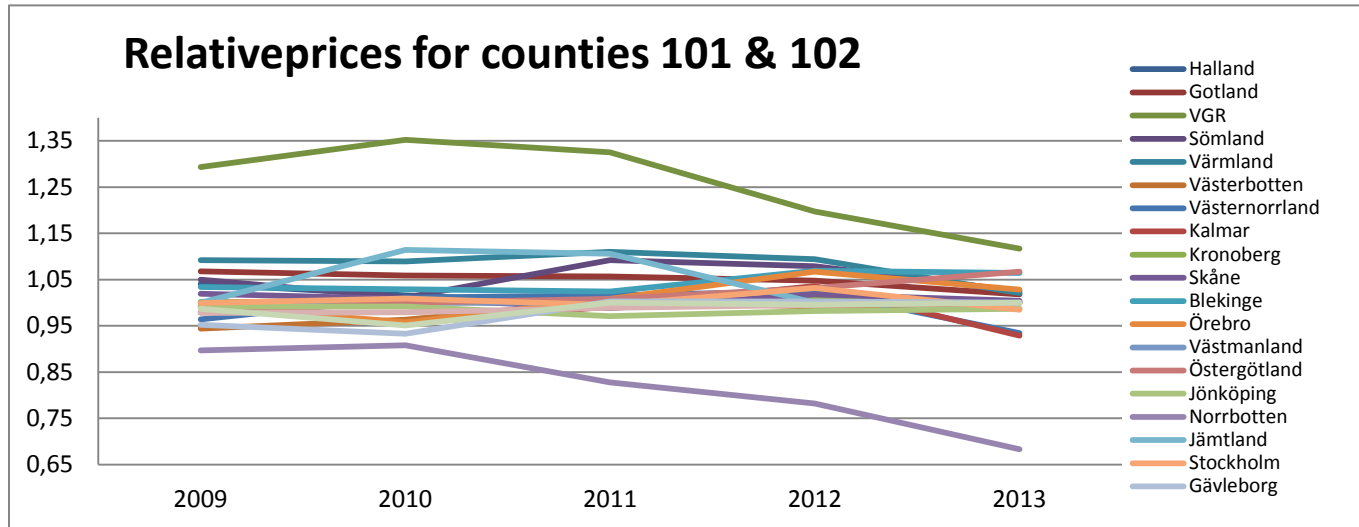


Table A 1: Relative prices across counties for procedures 101 & 102

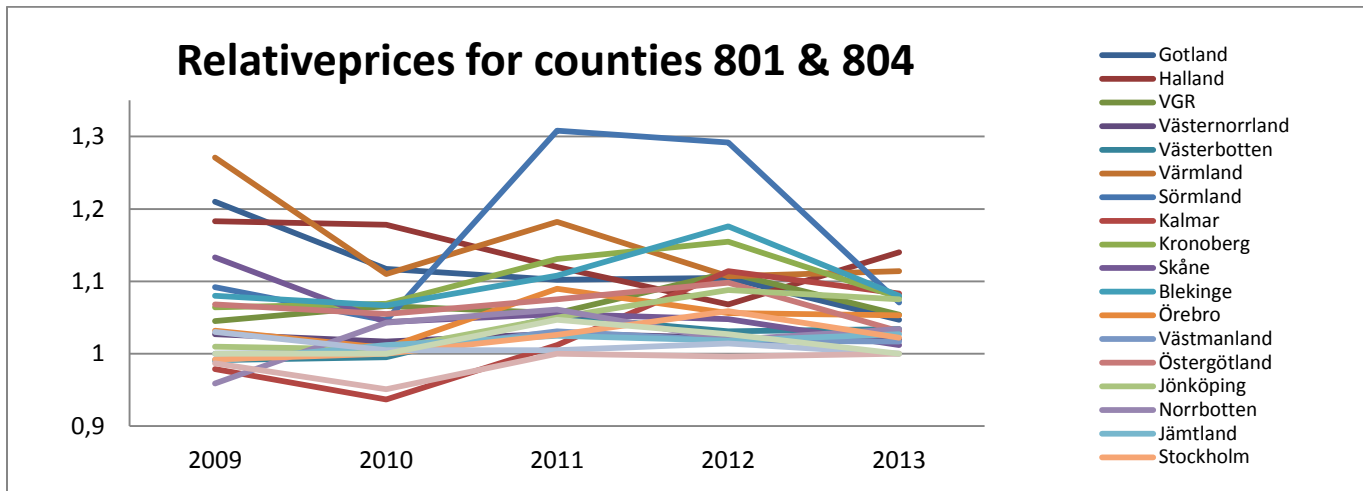


Table A 2: Relative prices across counties for procedures 801 & 804

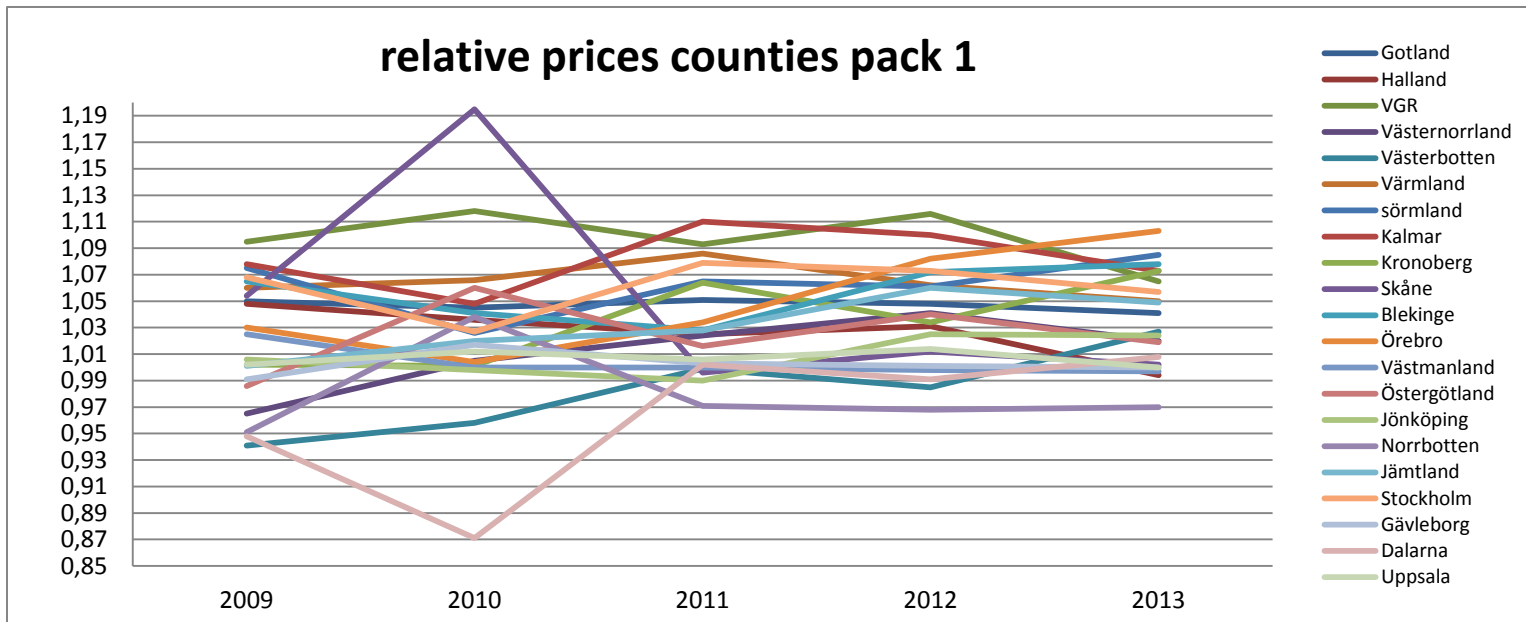


Table A 3: Relative prices across counties for procedures package 1

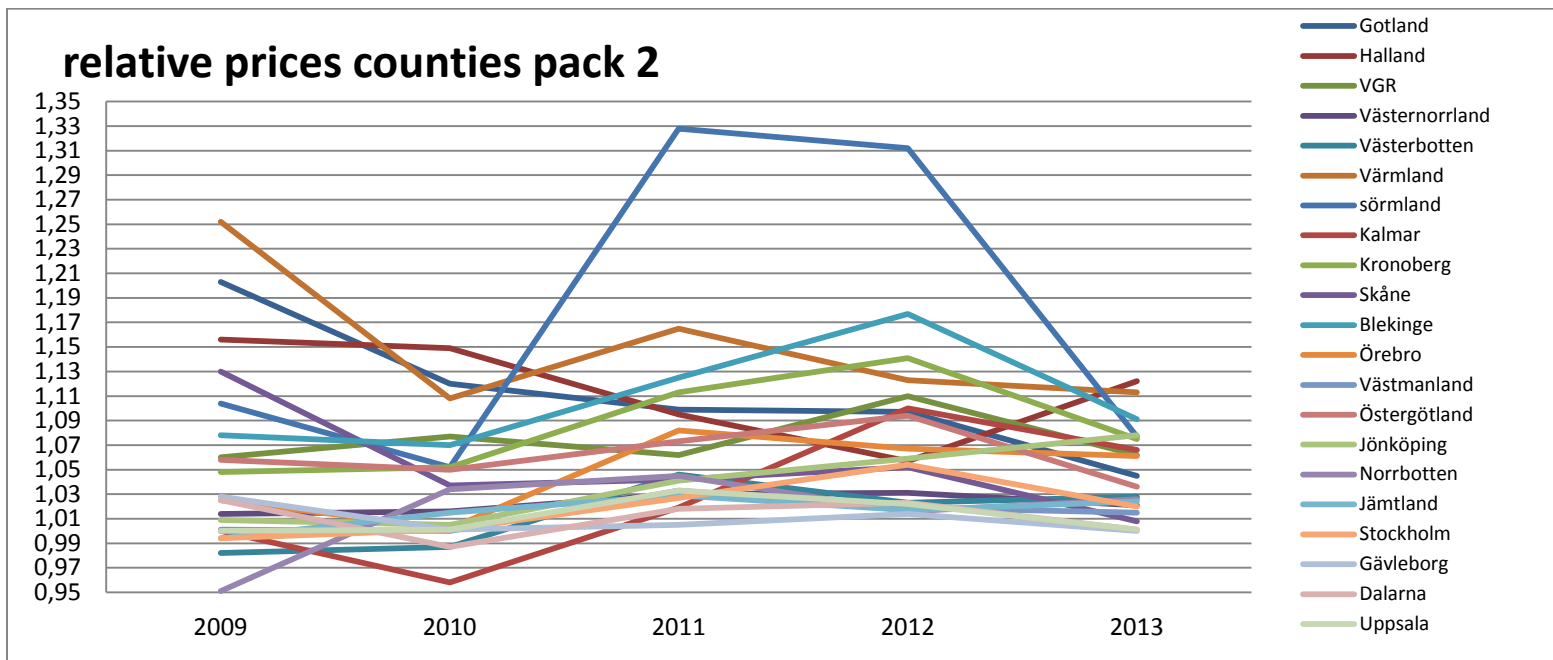


Table A 4: Relative prices across counties for package 2

| type of clinic | amount      | percent  |
|----------------|-------------|----------|
| public         | 1035        | 0,193784 |
| private        | 4306        | 0,806216 |
| <b>Total:</b>  | <b>5341</b> | <b>1</b> |

Table A 5: The proportion of private and public clinics

| County                    | political steps | political bodies involved in the process  |
|---------------------------|-----------------|---|
| Uppsala                   | 1               | LF (standing decision)                    |
| Gävleborg                 | 1               | Bolagstyrelsen                            |
| Dalarna                   | 1               | Tandvårdsnämnden                          |
| Västerbotten (since 2013) | 1               | Hälso- och sjukvårdsnämnden               |
| Norrbottnen               | 2               | LS-LF                                     |
| Örebro                    | 2               | LS-LF                                     |
| Västmanland               | 2               | LS-LF                                     |
| Jämtland                  | 2               | LS-LF                                     |
| Stockholm                 | 2               | LS-LF                                     |
| Östergötland              | 2               | LS-LF                                     |
| Jönköping                 | 2               | LS-LF                                     |
| Kronoberg                 | 3               | LSAU-LS-LF                                |
| Kalmar                    | 3               | Arbetsutskottet- LS-LF                    |
| Värmland                  | 3               | Folkhälso- och tandvårdsutskottet - LS-LF |
| Västernorrland            | 3               | Tand-och hälsovårdsnämnd-LS-LF            |
| Skåne                     | 3               | Vårdproduktionsutskottet - RS- RF         |
| Blekinge                  | 3               | Hälso-och sjukvårdsnämnd, LS , LF         |
| Sörmland                  | 3               | Moderbolagstyrelse-LS-LF                  |
| Halland                   | 4               | Närsjukvården-HSU-RS-RF                   |
| Västra Götaland           | 4               | TS-HSU-RS-RF                              |
| Gotland                   | 5               | HSN AU-HSN-RS AU- RS-RF                   |

Table A 6: table over differing political process across counties (name in swedish due to difficulties in translating)

Table A 7: Full regression table first stage for pack 1

| First Stage Package 1          |               |
|--------------------------------|---------------|
| VARIABLES                      | public_pack1  |
| politicalsteps                 | 0,138711***   |
| left                           | 0,0228982***  |
| right                          | 0,0100651***  |
| taxratecounty                  | -0,0318968*** |
| Public_adm                     | -0,0175996*** |
| ref_pack1                      | 1,561116***   |
| higher                         | -0,0037608*** |
| log_pop_income                 | -0,5045931*** |
| pop_dens                       | 0,0008808***  |
| 2009b.year#co.ref_pack1        | 0             |
| 2010.year#c.ref_pack1          | -0,0007106*** |
| 2011.year#c.ref_pack1          | 0,0000964***  |
| 2012o.year#co.ref_pack1        | 0             |
| Observations                   | 337531        |
| Standard errors in parentheses |               |
| *** p<0.01, ** p<0.05, * p<0.1 |               |

Table A 8: Full regression table second stage for pack 1

| Second Stage Package1          |                            |
|--------------------------------|----------------------------|
| VARIABLES                      | private_pack1              |
| public_pack1                   | -0.210***<br>(0.00300)     |
| ref_pack1                      | 1.601***<br>(0.00547)      |
| higher                         | -0.00223***<br>(3.68e-05)  |
| log_pop_income                 | 0.0673***<br>(0.00328)     |
| pop_dens                       | 0.000309***<br>(3.39e-06)  |
| 2009b.year#co.ref_pack1        | 0<br>(0)                   |
| 2010.year#c.ref_pack1          | -4.90e-05***<br>(1.09e-05) |
| 2011.year#c.ref_pack1          | -0.000511***<br>(8.60e-06) |
| 2012o.year#co.ref_pack1        | 0                          |
| Constant                       | -3.377***<br>(0.0115)      |
| Observations                   | 337,531                    |
| Number of id_new               | 115,224                    |
| Standard errors in parentheses |                            |
| *** p<0.01, ** p<0.05, * p<0.1 |                            |

Table A 9: Full regression table first stage for pack 2

| First Stage Package 2          |              |
|--------------------------------|--------------|
| VARIABLES                      | public_pack2 |
| politicalsteps                 | 0,0413507    |
| left                           | 0,0180416    |
| right                          | 0,389018     |
| taxratecounty                  | -0,0207817   |
| Public_adm                     | -0,1176621   |
| ref_pack2                      | 1,336846     |
| higher                         | -0,0018036   |
| log_pop_income                 | -0,5287699   |
| pop_dens                       | 0,0001546    |
| 2009b.year#co.ref_pack2        | 0            |
| 2010.year#c.ref_pack2          | -0,0017129   |
| 2011.year#c.ref_pack2          | 0,0023834    |
| 2012.year#c.ref_pack2          | 0,004786     |
| Observations                   | 337,531      |
| Number of id_new               | 115,224      |
| Standard errors in parentheses |              |
| *** p<0.01, ** p<0.05, * p<0.1 |              |

| Second Stage Package2          |                            |
|--------------------------------|----------------------------|
| VARIABLES                      | private_pack2              |
| higher                         | 0.00344***<br>(2.34e-05)   |
| log_pop_income                 | 0.0107***<br>(0.00171)     |
| pop_dens                       | -2.17e-05***<br>(1.58e-06) |
| public_pack2                   | 0.0676***<br>(0.00113)     |
| ref_pack2                      | 0.927***<br>(0.00176)      |
| 2009b.year#co.ref_pack2        | 0<br>(0)                   |
| 2010.year#c.ref_pack2          | -0.000117***<br>(5.27e-06) |
| 2011.year#c.ref_pack2          | 0.00286***<br>(5.98e-06)   |
| 2012.year#c.ref_pack2          | 0.00434***<br>(8.91e-06)   |
| Observations                   | 337,531                    |
| Number of id_new               | 115,224                    |
| Standard errors in parentheses |                            |
| *** p<0.01, ** p<0.05, * p<0.1 |                            |

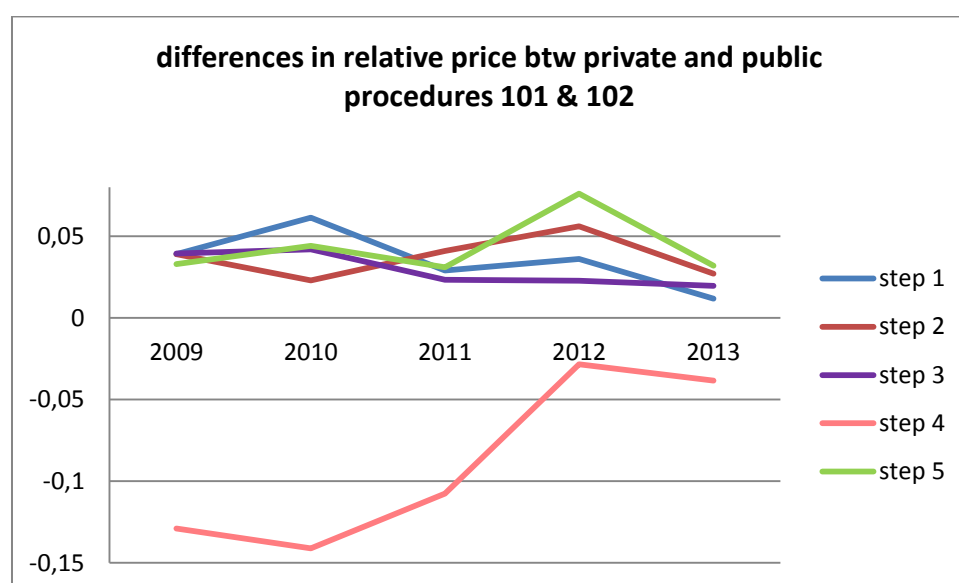
Table A 10: Full regression table second stage for pack 2

Table A 11: Full regression table first stage for procedure 101 & 102, 801 & 804

| First stage of 2SLS            |                  |                  |
|--------------------------------|------------------|------------------|
|                                | 101&102          | 801&804          |
|                                | log_county_price | log_public_price |
| log_ref_price                  | 1.444167***      | 0.9927782***     |
|                                | (0.0225552)      | (0.0015244)      |
| higher                         | 0.0038852 ***    | -0.0018247***    |
|                                | (0.0004304 )     | (0.0003029)      |
| log_pop_income                 | -0.2057973***    | -0.2502143***    |
|                                | (0 .030971)      | (0.0213669)      |
| pop_dens                       | 0.0001815        | 0.0000313        |
|                                | (0.0000317)      | (0.0000209)      |
| year#c.log_ref_price           |                  |                  |
| 2010                           | -0,0013048***    | -0.0005399***    |
|                                | (0.000239)       | (0.0000856)      |
| 2011                           | -0.0022992***    | 0.0038505***     |
|                                | (0.0003329)      | (0.0001309)      |
| 2012                           | -0.0054672***    | 0.0049616***     |
|                                | (0.0004336)      | (0.0001859)      |
| Public_adm                     | -0.0582042***    | -,0385374***     |
|                                | (0.0038432)      | (0.0023914)      |
| right                          | -0.0224269***    | 0.0413852***     |
|                                | (0.0028651)      | (0.0017322)      |
| left                           | 0.0418934***     | 0.0079894***     |
|                                | (0.0020523)      | (0.0011392)      |
| taxratecounty***               | -0.0325681***    | 0.0033381**      |
|                                | (0.0027111 )     | (0.0016314)      |
| political steps                | 0.068989***      | 0.0350093***     |
|                                | (0.0013906)      | (0.0009538 )     |
| constant                       | -1,607123        | 1.406321         |
|                                | (0.2189602)      | (0.1129104)      |
| Standard errors in parentheses |                  |                  |
| *** p<0.01, ** p<0.05, * p<0.1 |                  |                  |

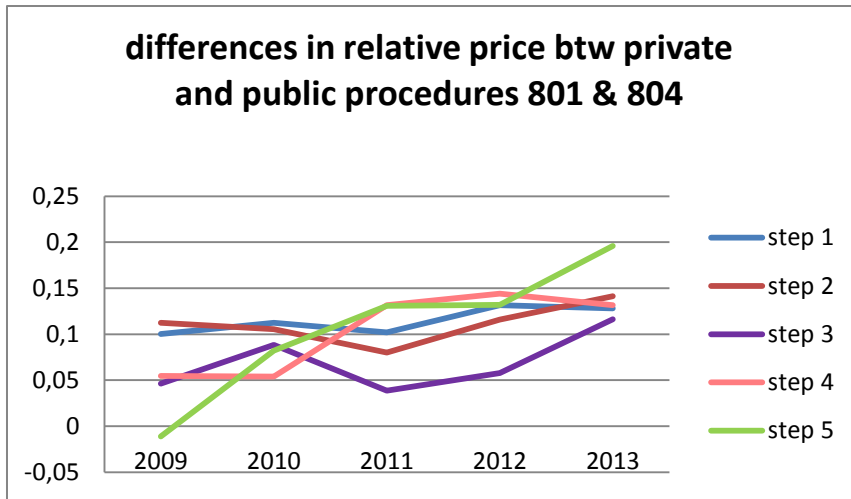
Table A 12: Full regression table second stage for procedure 101 & 102, 801 & 804

| Second stage of 2SLS           |                            |                           |
|--------------------------------|----------------------------|---------------------------|
|                                | 101&102                    | 801&804                   |
|                                | log_private_price          | log_private_price         |
| log_public_price               | 0.367***<br>(0.00300)      | 0.628***<br>(0.0105)      |
| Log_ref_price                  | 0.955***<br>(0.00668)      | 0.316***<br>(0.0104)      |
| higher                         | -0.000728***<br>(8.52e-05) | 0.00383***<br>(0.000119)  |
| log_pop_income                 | 0.0306***<br>(0.00609)     | -0.0219**<br>(0.00904)    |
| pop_dens                       | 7.31e-05***<br>(5.55e-06)  | 3.91e-05***<br>(7.96e-06) |
| 2009b.year#co.log_ref_price    | 0<br>(0)                   | 0<br>(0)                  |
| 2010.year#c.log_ref_price      | -0.00307***<br>(5.36e-05)  | 0.000667***<br>(3.83e-05) |
| 2011.year#c.log_ref_price      | -0.00298***<br>(7.38e-05)  | 0.00172***<br>(6.95e-05)  |
| 2012.year#c.log_ref_price      | -0.00327***<br>(9.81e-05)  | 0.00293***<br>(9.82e-05)  |
| Constant                       | -2.189***<br>(0.0467)      | 0.531***<br>(0.0500)      |
| Observations                   | 20,926                     | 24,970                    |
| Number of id_new               | 6,912                      | 8,307                     |
| Standard errors in parentheses |                            |                           |
| *** p<0.01, ** p<0.05, * p<0.1 |                            |                           |

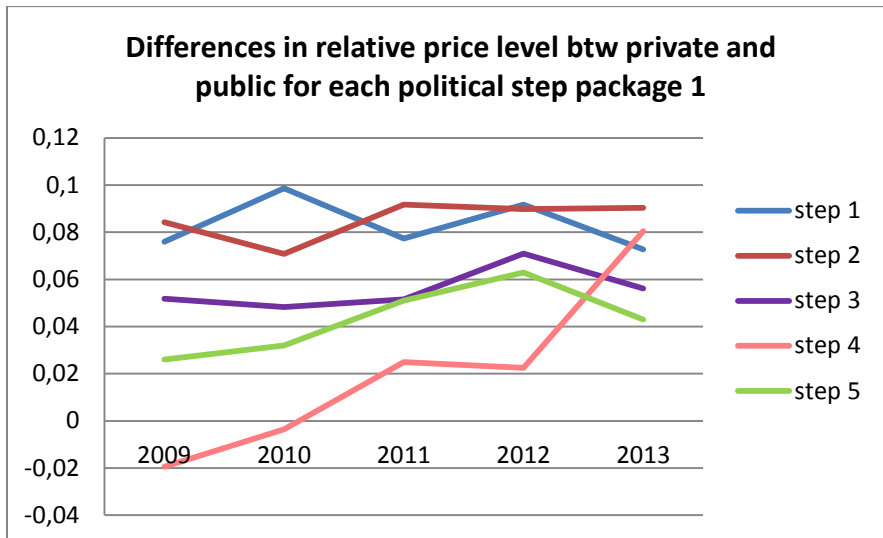


Graph A 1: Differences in relative prices btw private and public

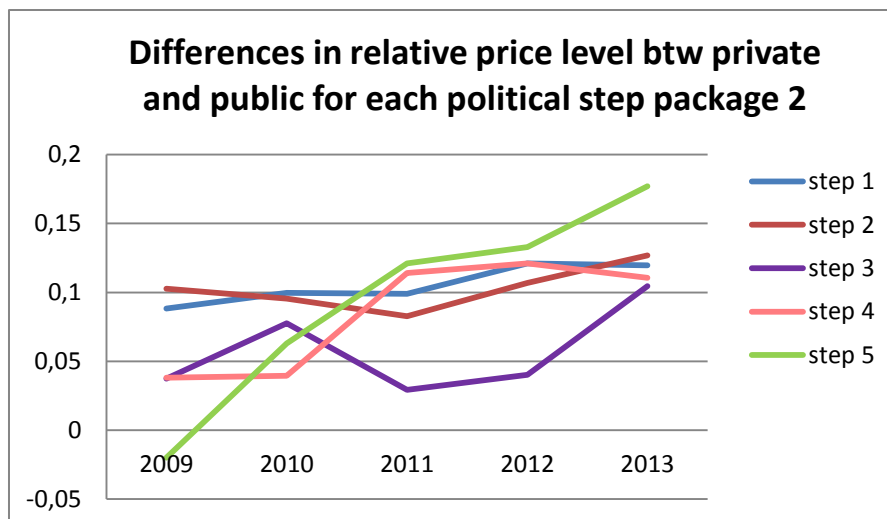




Graph A 2: Differences in relative prices btw private and public



Graph A 3: differences in relative prices btw private and public



Graph A 4: differences in relative prices btw private and public

|                          | Counties   | Since | Number of political steps |
|--------------------------|--|-------|---------------------------|
| Follows DPBA strictly    | Uppsala  | 2008  | 1                         |
|                          | Västmanland,   | 2008  | 2                         |
|                          | Jämtland   | 2008  | 2                         |
|                          | Skåne  | 2011  | 3                         |
|                          | Dalarna  | 2012  | 1                         |
|                          | Västerbotten   | 2013  | 1 (since 2013)            |
| Follows DPBA semi-strict | Gotland  | 2008  | 5                         |
|                          | Gävleborg  | 2010  | 1 (since 2010)            |
| Not at all               | Västra Götaland,<br>Halland, Värmland,<br>Sörmland,<br>Östergötland, Kalmar,<br>Norrbotten, Örebro,<br>Västernorrland,<br>Stockholm, Jönköping<br>Kronoberg, Blekinge, |       | 2-4                       |

Table A 13: Shhowng which counties that follows TLV, semi-strict follows TLV and not at all

## 7.2 Appendix B - questionnaire

### 9.2.1 English version of the questionnaire

#### General questions:

- In what part of the county are you employed?
- 

- Are you a politician or a public servant?
- 

- Can you explain what your worktasks?
- 

#### Dental Tariff

- Who proposes to develop a new dental tariff?
    - Who is given the assignment to develop the new dental tariff?
    - Who delegates the assignment to develop the new dental tariff?
- 

- Under what conditions is the assignment distributed?
    - Only to cover the costs?
    - Special goals and aims with the dental care –e.g. increase volume on specific procedures?
- 

- How is the individual clinics managed? As individual units, with the goal to bear their own costs? Or is the FTV seen as one unit within each county?
- 

- How is the tariff developed?
    - Annual revaluation?
    - Cost principle?
    - Patient perspective? – keep costs down for the patients.
- 

- Are all procedures evaluated everytime a new price list is developed?
  - What decides if only one procedure is being evaluated? –change in costs, financial targets, changes in the reference price?

- Describe the path from initiation of the evaluation process to a proposal to the final pricelist. Which political structures, organs, and committees does the proposal pass before the final decision? We are looking for a diagram displaying how the path of the proposal.
- 

- Will different bodies in the process make suggestions to the new price list proposal?
    - Changes due to reach some dental strategic goals?
- 

- To what extent or in what way are the reference pricelist taken into account when setting prices?
- 

- Do you look at private dental care providers prices when evaluating your own prices?
- 

- When, during the year, is the evaluation process starting? Both the calculation process at the FTV and when the political process starts.
- 

- At what date does the new price usually begin ?
- 

- What is the total duration of the process?
- 

- Who calculates and produces documentation for price changes within FTV?
- 

#### Strategy/aims/targets

- Is there an overall objective of the pricing in the County for FTV? What is behind this aim?
  - Quantitative or qualitative goals
  - Keep the budget
  - Make a profit
  - Is the budget surpluses moved to the next fiscal year or is it given to the County Council budget?
  - Increase the amount of adults consuming dental health care?

- 
- Is price sensitivity taken into account when calculating and evaluating the price list?
- 

- What do you base your calculations on when calculating the new price list?
  - Expenditure of time
  - Material cost
  - rents

### *9.2.2 Swedish version of the questionnaire:*

#### Allmänt:

- I vilken del av landstinget arbetar du?
- 

- Politiker eller tjänsteman?
- 

- Vad är din arbetsuppgift?
- 

#### Tandvårdstaxan

- Vem/vilka föreslår att ta fram ett förslag för tandvårdstaxan inom FTV?
    - Vem ges i uppdrag att ta fram den nya tandvårdstaxan –
    - Vem ger i uppdrag att ta fram den nya tandvårdstaxan
- 

- Under vilka förutsättningar ges uppdraget?
    - Bära kostnader?
    - Mål med tandvården – öka volym på vissa åtgärder?
- 

- Hur drivs klinikerna? Som egna enheter med målet att bära sina egna kostnader? Eller ser man FTV som en enda stor resultatenhet?
-

- Hur tas förslag till ny tandvårdstaxa fram?
    - Årlig uppskrivning
    - Självkostnadsprincip
    - Patientperspektiv – Hålla kostnaderna nere för patienterna
- 

- När man utvärderar tandvårdstaxan utvärderas alla åtgärder samtidigt?
    - Vad avgör om en enskild åtgärd utvärderas – kostnadsförändring, budgetmål, referenspriserförändringar?
  
  - Hur är vägen från uppdrag till underlag till slutgiltigt prisförändringsbeslut? Vilka instanser/organ, utskott eller kommittéer passerar förslaget? Vi söker en schematisk bild hur förslaget går genom olika instanser och var det kan skickas på remiss.
- 

- Kommer olika instanser med bidrag till förslaget om nya tandvårdstaxan?
    - Ändringar – Tandvårdsstrategiska inlägg för att se till konsumtion och kostnadsbörda
- 

- I vilken grad eller på vilket sätt tas referenspriserna i beaktande vid prissättningen?
- 

- Tas privata vårdgivares priser i beaktande?
- 

- När startar utredningen under året? Både kalkyleringsmässigt men även när själva beslutsprocessen startar?
- 

- När sätts tandvårdstaxan?
- 

- Hur lång tid tar det från det att uppdrag om att ta fram tandvårdstaxa till dess att LF beslutar om ärendet?
- 

- Vem/vilka kalkylerar och tar fram underlag för prisförändringarna inom FTV?
-

## Strategi/mål

- Finns det ett övergripande målet med prissättningen i landstinget för Folktandvården och varför har detta målet sats?
    - Kvantitativa och kvalitativa mål
    - Hålla budget?
    - Gå med vinst?
    - Förs budgetöverskott över till nästa period och kan detta i så fall påverka prissättningen?
    - Öka antalet vuxna som konsumerar tandvård?
- 

- Tas priskänslighet för olika åtgärder med i utvecklingen av tandvårdstaxan?
- 

- TLV gör sina beräkningar med bland annat tidsåtgång, materialkostnad och normala indirekta kostnader? Vad tittar ni på i era egna kalkyler?
  - Hur är uppdelningen?
  - Vi tror att variationer i resultaten från självkostnadskalkyler står för en del av variationerna i tandvårdstaxan mellan landstingen.
  - Finns det en sammanställning över kostnadskalkylen. Tidsåtgång, materialkostnad, hyreskostnad.
  - Kan vi få tillgång till en sådan sammanställning. Åtgärdsspecifik data.
  - Kalkylbladen för hur åtgärdstaxan sätts