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The Net Utility Model –A Goldmine of the net companies?

A Stated Preference Study Regarding the net companies Responds and Attitude after Applying the Net Utility Model

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Abstract

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The Net Utility Model- A Goldmine of the Net Companies

The Swedish electricity market was deregulated in 1996 and as a consequence of this the net companies are acting on a natural monopoly market. The Net Utility Model was introduced to force the net companies to charge fair prices for the distribution of electricity. The model was developed by the Energy Agency to create an incentive for the net company to increase efficiency and is still under construction.

The purpose of this report is to examine the net companies response and attitudes after that the Net Utility Model is applied. Within that, it is questioned which arguments the net companies present in order to motivating a debit degree of more than 1,0. Further are the net companies' views of their customers demands examined. This is done by a method called Stated Preference where the respondent is faced with different scenarios and has to choose the best alternative.

The conclusions of the study are that several arguments stressed by the net companies are valid and therefore are allowing a debit degree higher than 1.0. However, the Energy Agency considers that the model already takes these arguments into consideration. On the other hand the net companies stress that the model does not take the arguments enough into consideration. Several of the net companies' arguments are valid if tested in a competitive market. The net companies do not emphasize the assumed arguments of their customers but stress their own technical arguments.

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1 Introduction

A background to why the problem has risen is given. Theory regarding main phenomena's is presented in order to better understand the problem and its relation to the background. Further, aim and scope are defined.

1.1 Background

In 1996 the Swedish electric power market was deregulated. The purpose with the deregulation was to create competition and by this, increase the efficiency of production of electricity. This was done by clearly separating the production and trading with electricity from the electricity distribution. The electricity distribution which is characterized by a natural monopoly is still under regulation since 1939 (Söderberg, 2003). This resulted in a more intense competition between producers and traders, but the electricity distribution companies' exclusive rights to deliver to end-customer remained. (Lantz, 2003)

The power sector is i.e. divided into three parts. The first one is the power producing part which incorporates nuclear power plants, water power plants, wind power stations etc. The second part is the power trade which today is partly situated to NordPool, the Nordic Power Exchange. This part is the easiest to enter; no concession is demanded when trading with power. Both these parts are characterized by free competition. Consequently, customers could freely choose power supplier (STEM). The third part is the electricity distribution. Trading with electricity and electricity distribution must be operated by two separated legal persons. This means that the customer reaches agreements with two parts, both the power supplier and the company which transfers the power. (STEM)

In Sweden electricity distribution is operated in a monopoly situation, supported by concession. In July, 2001, regulations in the Swedish law regarding electricity are changed. Power distributors' tariffs are now to be formulated on objective facts. The starting point for fairness judgement shall not be the net companies' (from now on NC) costs, but their accumulated performance they are estimated to deliver. Net tariffs shall be

worded on the basis of objective reasons. Further the distribution of power must be of good quality. (Ellagen, 1997:857, 3-4 kap)

In addition to the changes of the law, the Energy Agency (2004) wants easily and efficiently be able to judge if the net tariffs are fair or not. A system that is able to systematize and standardise is requested. Further, it is problematic within the frame of the regulation pressuring the companies to efficiency, it has also been and difficult to define what reasonable tariffs are when a clear and generally accepted reference object is missing (Kjellman, 2004). It is decided to start developing a new tool of regulation because the used regulation model was founded to be inadequate (Kinnunen, 2003).

1.2 Natural monopolies

When dealing with natural monopolies and other markets one has to consider the marginal benefit of the use of a good, due to the neo-classicist, who first appear on the economic scene in the 1870's and who have the marginal quantity as distinguishing feature. Many authors also use the term marginalists to describe the neo-classicists (Sandelin et al, 2001). The neo-classical theory is essentially focusing on micro economic issues where consumers are assumed to maximise their benefit and where companies are assumed to maximise their profit on a free market (Ibid), but this is also true for companies in other markets e.g. natural monopolies (Case, Fair et al, 1999).

In theory where competition is ideal, there is natural monopoly in a particular market when only one single firm can produce the desired output at lower cost compared to a market where several competing firms exist, thus, "for a monopoly to be natural, it is necessary that a single firm remain as the most efficient producer" (Sharkey, 1982).

The net market is a so called natural monopoly, i.e. it is defined as the "unsuitability of competition" (Train, 1991) and thus it is economic inappropriate to have more than one producer of a god. A natural monopoly appears from two sources: economies of scale and economies of scoop, economies of scale when the average cost decreases with the number of output and economies of scale when the cost of producing two or more

gods/services together is cheaper than producing them separately (Sharkey, 1982). Kaysen and Turner describe natural monopoly as "one of several situations in which competition may be unworkable" (Sharkey, 1982). They present three different situations where there are characteristics of natural monopoly:

a) *Situations in which competition, as a practical matter, cannot exist or survive for long, and in which, therefore an unregulated market will not produce competitive results.*
b) *Situations in which active competition exists, but where, because of imperfections in the market, competition does not produce one or more competitive results.*
c) *Situations in which competition exists, or could exist, and has produced or may be expected to produce competitive results, but where in light of other policy considerations competitive results are unsatisfactory in one or more respect (Sharkey, p 17, 1982).*

In the case of the net market, argument a) is relevant because of practical matter mentioned above – the NC cannot exist or survive for long, and in which, therefore an unregulated market will not produce competitive results. The net market is a result of economies of scale, but the size of the approximately 180 Swedish NC (svensk energi) is varying enormously. That means that some of the smaller companies may suffer from diseconomies of scale, but the reality is somewhat different from the theory. A large number of the Swedish NC are in fact small but they do not suffer from diseconomies of scale, this because it would not be economically defendable to have several nets in the same area.

To avoid monopoly profits the neo-classical theory states that the price shall be equal to marginal cost. The reason is shown in the figure beneath. A monopolist chooses to produce where the marginal cost is equal to marginal revenue, i.e. Q2 units for the price of P2. The surplus of the buyers then corresponds to the area HFP2 and the surplus of the seller of the area P2FGJ. If now the monopolist is forced to produce where the price is equal to marginal cost (point E), the production will rice to Q1 units and the price will

fall to P1. Now the surplus of the buyers is the area HEP1 and the surplus of the seller is P1EJ. The sum of the surplus of the buyers and the seller is then JHE which maximizes the total surplus. The efficiency surplus that is achieved with a marginal cost based pricing is the shaded area in the figure below.

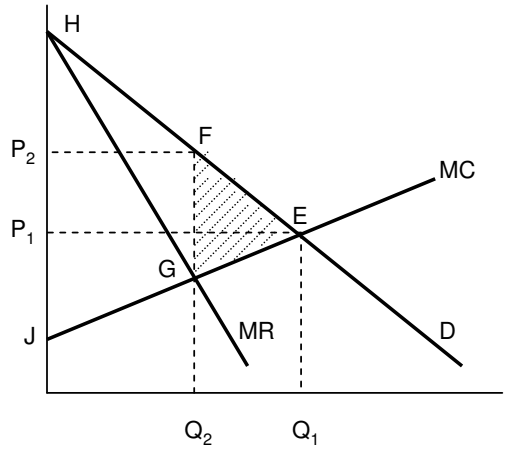

Figure 1, Efficiency surplus in shaded area.

1) *Society may wish to protect buyers from a price that is too high and to recapture the loss in consumer surplus associated with monopoly pricing.*
2) *Society may wish to protect a natural monopolist from opportunistic behaviour on the part of consumers or other parts.*
3) *Society may wish to promote stability in an unstable market.*
4) *Society may wish to delineate the market boundaries that separate a natural monopoly sector of a given market.*
5) *Society may wish to prevent collusion among incumbent firms or certain behavioural abuses, such as predatory pricing.*

The most important argument for the NC' customers is the first mentioned argument (Sharkey, 1982). Without regulations of an unconstrained monopolist will set a price that is greater than the average cost of production (Ibid). Hence, a monopolist will set a price where marginal cost equals marginal revenue (Case, Fair et al, 1999).

1.3 Optimized regulation and Regulation models

The regulator wants to achieve efficiency, thus create an incitement to effectiveness, both in the short and long run. The different models are usually representing a compromise between the two. There are however no regulation model that considers both efficiency in the short and long run. Lantz (2003) introduced a development of the Net Utility Model to meet this need.

The Nordic countries have long experience of an unregulated electricity sector. The authorities in these countries have different opinions how to regulate the monopoly part of these markets. There are two main ways to regulate ex ante and ex post. Denmark and Norway have adopted the use of ex ante regulation (Kinnunen, 2002). This means that the regulation is done in advance on expected data (Lantz, 2003). In Sweden and Finland the ex post system is used. With the ex post regulation the regulator regulates post a specific time period and thus uses real and observed data (Lantz, 2003). In this paper only the different types of ex post regulation will be examined because of its relevance later in this paper.

There are four different ex post regulating systems that are used and those are:

- Subvention models
- Rate of return regulation
- Yardstick regulation
- Price cap regulation
- Revenue cap regulation

The Yardstick and Revenue cap models are further described below then these models constitutes components in the NUM.

1.3.1 Yard stick regulation

Shleifer (1985) proposed that the regulator should evaluate the costs of the companies, with some kind of comparing measurement, which makes the regulation an indirect competition between firms (Bös, 1994), to estimate the cost level of the regulated companies if they ran their business cost efficiently. Shleifer believed that this was possible to achieve if the comparing measurement had a base that did not had anything to do with the actual costs or achievements. Shleifer also thought that similar companies on different markets should be compared with each other to find a cost level that is reachable and to create a competition like environment.

Advantages of the model is that if for instance a company lowers its prices while others don't, the company can increase its revenue. Every company has an incentive to run its business cost effective. Another advantage is that the regulator does not need much information to regulate. Disadvantages are for instance, sensitivity to agreements between regulated parts which can lead to higher profits because of incorrect information from the regulated part. There must be a number of similar companies with comparable conditions i.e. income and cost structure. If not the model then has to be adjusted to be able to work (Lantz, 2003).

1.3.2 Revenue cap regulation

The price cap regulation is "*the most discussed and significant innovation in utility" regulation" (IPA energy consulting)* and with this regulation the regulator sets a maximum price that the monopoly company is allowed to charge. By doing this the regulator creates an incentive for the monopoly company to reduce the costs and what determines the profit is the ability to create a difference between income and costs. Usually this form of regulation is used for a set of products (basket) and the company is free to set what price it wants for one single product but the total price of the different products has to have a predetermined value. This value is changed over time and follows the consumer price index, but it is also adjusted with a factor X that corresponds to efficiency improvements. The model is called RPI-X (Littlechild, 1983) and its advantages are 1) it creates great flexibility for the regulator, 2) it gives incentive for the regulated part to be cost efficient 3) the regulator does not have to gather a large number of data.

On the other hand, some the disadvantages are that the regulator has to set a correct maximum price and that can be difficult. Further the regulated part can act like it is less efficient to get a maximum price that is not as low as it really is, as a result of the regulated company giving false information (Lantz, 2003).

1.4 The Net Utility Model

1.4.1 Regulation of the Swedish electricity distribution and the Net Utility Model

The aim with regulating NC is to create effective NC and to achieve a fair cost-distribution between NC and the customers-collective. With care taken to the government's distribution policy all efficiency-profits should not stay within the NC, but partly be distributed to the customer-collective via lowered tariffs. Customers have their right to fair tariffs, irrespective of if the NC is ineffective or drawing high profits. (STEM)

In order to satisfy pricing structures and stimulate cost-efficiency; the Swedish Energy Agency has lately formulated the Net Utility Model (NUM) which is supposed to lead to self regulating companies (STEM) which is in line of today's electric economic models, a mixture of regulated and open market components (Management Quarterly, 2003).

"Energimyndigheten ska se till att nätverksamhet bedrivs effektivt, säkerställa att nättarifferna som kunderna betalar är skäliga samt att nätföretagen i övrigt tillämpar objektiva och icke-diskriminerande villkor så att konkurrens inom elhandeln främjas…"

"The Energy Agency shall make sure that the operation of the electricity net is efficiently managed, the net tariffs are fair and that objective and non-discriminating conditions are used so that the competition in the trade is promoted…"

Freely summarized the statement says that it is the task of the Energy Agency to make sure that the electricity distribution is effective and that the net tariffs are fair. By using the model, the Energy Agency could from a template estimate the performance of the individual NC and formulate guiding lines to all NC regarding respective over-pricing legitimacy (STEM).

The NUM is a hybrid of the yardstick regulation and the revenue cap revenue. This means that it takes into consideration both income (numerator) and the standard cost or the net utility in the denominator (Lantz, 2003), which generates cost-efficiency. The NUM underlies what is a reasonable net charge for the individual NC.

1.4.2 Description of the Net Utility Model

The purpose for the NUM is to create competition (STEM). This is done by creating a fictive net which has the objective to compete towards NC (Kjellman, 2000). The grade of efficiency is measured in debit degree (from now on DG) and if a company exceeds 1,0 in DG, it is considered to use its monopoly position (STEM).

The theory behind the NUM is that the model shall describe the cost of a new player in the net area to run a business. This player will have the same objective cost as the real network company but it will not have the historical costs as the real player has (STEM).

The NUM calculates the fair debiting value in several steps:

1) A standard objective net is calculated. This net is not a real net i.e. it is created to estimate the costs and the resources needed to build a real network. When creating this fictive network one builds just a simple net and not a net with redundancy.
2) The investment cost for the standard net is calculated, i.e. capital base calculated with a depreciation of 40 years and an interest rate of 4,8%
3) The yearly standard cost for the comparing network is calculated including capital costs, operation and maintenance costs, customer specific cost and net losses (nätförluster), for 2002 190 SEK/MWh.
4) The quality for the business is calculated i.e. the extra costs for redundancy.
5) The quality costs and the tariffs for the regional net are added to the standard costs.

The costs described above are then compared to the income during the specific period. As mentioned above the preferred DG is 1,0. This means that an already existing company should be able to perform better than a company that is new on the market (STEM).

$$\text{Debit degree} = \frac{\text{Real revenues}}{\text{Cost of fictive net} + \text{Cost of regional net} - \text{Quality reduction}}$$

1.4.3 Applying NUM

The aim when applying the NUM is to create as strong incentives for the NC as companies in competitive markets (STEM).

Supervision is conducted on initiative from the Energy Agency and is based on information which the agency enquires from the concession possessor supported by directions and general advices. In those cases where the NC considers that the assessment

of the tariffs legitimacy which the NUM indicates are unfair, it will primary be the NC's burden to show this (STEM).

Companies that have a too high DG will be closer examined and they have to develop a plan of action that describes how to become more efficient to reduce the debiting value, but creating a more efficient company must not affect the quality of the product (STEM).

1.4.4 Advantages with the model

The advantage of the model is a combination of the Yardstick regulation and the Revenue cap regulation which strive for creating cost efficiency. In other words the profit will be the difference between the regulated total income and the cost of the activity that the company has. This will give the companies an incentive to reduce their costs and to develop a more efficient company (Lantz, 2003).

1.5 Problem

Among other obstacles, the law that controls the electricity distribution is in many aspects not straight forward. The law says that the tariffs shall be fair which results in problems interpreting the law, the question is what is fair. Kjellman (2000) points out that experience has shown that it is difficult to develop and apply central concepts used in the law of electricity, among them the fairness judgement. Further, it has within the frame of the regulation been problematic pressuring the companies to efficiency. The context that the law handles is i.e. a complex problem. The NUM has to take both prevailing sections of the law and conditions which prevail within electricity distribution into consideration and in the same time create efficiency among the NC.

According to the neo-classicists one strives to maximize its own utility (Sandelin et al, 2001), but when creating a model that is supposed to be a competitor to NC the maximization is hard to accomplish because of incomplete parameters in the model. A result of this is that the model has, in pilot projects conducted by the Energy Agency, continuously been redesigned with always new debit degrees as a result, which is another problem; because when the parameters all the time are changed there will be greater

space for argumentation. The question being asked is where the upper limit of the debit degree shall be set when so many factors complicates and makes it more complex solving setting it. When not even the Energy Agency can conclude exactly when and how the NUM shall be applied, the NC sees the possibilities for striving for an debit degree as high as possible without triggering counter actions. The NC has thus presented heavy criticism regarding the model and its structure. It becomes difficult to conceptually criticise and to, by quantitative measurement, verify their relevance. Economical and political perspectives of the model might then play different roles in the argumentation. A hypothesis is that arguments being hard to control will in particular be used. If so, arguments will finally be tried before a court of law instead of being solved within the context.

1.6 Aim and Scope

This paper is a part of an extensive study which in whole aims to claim to describe the consequences of the NUM from a customer perspective. The part of the study which is publicised in this paper intends to map the NC' response and attitudes after applying the NUM.

The paper is delimited to two fields. The first field analyses, within the context of the NUM, the relations between arguments that the NC' presents towards the Energy Agency, future pricing and investment strategies and their estimated DG.

The second field states and interpret NC' presumptions of customer companies' preferences regarding their power situation. Presumed stated preferences are further related to the NC presented arguments.

2 Method

Why the certain approach is used is motivated and connected to theory. Validity and reliability is discussed. Further, the ongoing methology is described where Stated Preference is stressed. Finally, questions in the main suervey are stated and motivated.

2.1 Approach and method

A combination of the inductive and deductive approach is the abdicative approach. In such an approach each unique case is interpreted on the basis of a hypothetical pattern. The interpretation should then be verified by new cases. Through the approach the empirical field of applying is continuously developed and the theory is adjusted and refined (Patel & Davidson, 1994).

Research could have either a qualitative or quantitative focus. This refers to in which way the gathered data is analysed and used. The qualitative method is characterized by that the data is analysed with verbal methods of analysis. Is the problem about interpreting and understand humans, research with a qualitative focus is preferred. The quantitative method is on the other hand characterized by systematic data processing and is preferred when dealing with statistical process- and analysis methods. (Ibid) T D Jick (1979) stresses the advantages of combining these two methods and emphases that much could be won doing that.

Positivism is in a strict sense based on formal logic and facts that are the result of a measurement. On the basis of this a theory is formulated which could be used as a support testing different hypotheses. Hermeneutics could be described as the opposite to positivism. While description and explaining follows positivism, hermeneutics are trying to give an all embracing picture. (Eriksson & Wiedersheim-Paul, 1997)

In this paper, empirical data is gathered both by interviews and surveys. Gathered data is analysed and related to existing theories which are presented in the paper. An understanding for the subject is developed mainly by reading theory describing the area.

Consequently, this paper takes an abdicative approach, involving a combination of quantitative and qualitative methods of data processing. A hermeneutic approach is adopted, but with elements of positivism.

2.2 Validity and reliability

Only by continuous and critical trials and carefulness, the researcher could achieve a satisfying degree of validity and reliability. (Holme & Solvang, 1997) Eriksson and Wiedersheim-Paul (1997) define validity as a measuring instrument to measure that really is to be measured. Reliability refers to if the same result reiterated when a study is conducted in different occasions (Maholtra, 1999). This assumes that the examined object is constant, which is questioned by the qualitative tradition where an interview is considered to be reliable despite that the same questions in the interview generates partly different answers at a another occasion. Reliability could rather be imagined to be plaited together with validity and could not be measured separately as in quantitative research. (Svensson & Starrin, 1996) How validity and reliability is reached in this paper is explained beneath.

2.2.1 Data gathering

Data could be distinguished as primary (data that is gathered by you) and secondary data (data that already exists). Eriksson & Wiedersheim-Paul (1977) means that it could be suitable to start up an investigation by using secondary data, which is both a cheaper and faster way to conduct data gathering.

2.3 Course of action

In order to get good measurements of the NC' arguments regarding the NUM and their customer preferences, we decided to perform a quantitative data gathering. In order to secure both validity and reliability efforts are putted in preparations of the quantitative survey, qualitative and quantitative preparing information gathering is performed.

2.3.1 Interviews

To get a clear picture over the basic ideas and opinions among both NC and their customer companies a series of interviews are conducted. Göteborg Energi AB, Pite

Energi AB, Dala Energi AB and SKF AB are chosen as interview objects. Göteborg Energi AB and SKF AB are handpicked objects for interviewing. Göteborg Energi AB has made their voice clear in media combating the NUM. They are augmenting that the NUM is based on a far too unrealistic modelling and is therefore unfair. SKF AB is a relatively large power consumer and has most likely actively acted on the basis of internal power politics. The two objects are i.e. with high probability well informed about the current power situation and could therefore educe valuable input, they also happened to be well situated in Gothenburg. These two interviews are conducted face to face in a less formal manner, both authors are present and the conversations are recorded. The fact that both authors were present during the interviews gives us the opportunity to compare our impression; the recorded versions could also be used when dissonance or misunderstandings are caused, which Trost (1997) claims is important.

In order to get a balanced picture of the situation among NC, two additional NC are interviewed; Dala Energi AB and Pite Energi AB. These are randomly chosen from the population of Sweden's proximally 180 NC. The interviews are conducted via telephone and are recorded. It is important that the interviewer registers the answers of the respondents with precision. It is, among others, important to observe changes in facial expressions and body language (Ibid). During the two last mentioned interviews, these behaviours could not be observed.

The result of the interviews, is a more objective picture of NC' opinions regarding the NUM. In order to get more arguments from the NC for exceeding the 1.0 DG and to get a better understanding of the NC' presumptions regarding customer preferences, a preliminary survey is launched.

2.3.2 A preliminary survey

The purpose with the preliminary survey is to higher validity and reliability in the main survey. The primary aim, is to get a better picture of the NC' argumentation, both from those that have a DG above and below 1.0. Secondary, customer preferences are measured. 15 NC were randomly chosen to participate in the survey. Information

gathered during the interviews is interpreted and stands now base for survey questions in the preliminary survey. With achieved knowledge, the main survey can be conducted with a higher level of validity and reliability.

2.4 Main survey

Supported by a solid knowledge base regarding NC' argumentation and presumptions of customers' preferences a main survey can now be designed. The subject and questions that are included in the survey are discussed with Björn Lantz, leading researcher in the field. Here too, valuable comments are given. The aim with the main survey is to measure the power in the NC' arguments against the NUM and their presumptions about customer preferences. The result will then be interpreted and used as empirical input when analyzing the stated problem. In order to connect a NC's size to its statements, the survey is open with general question that measures the size of the respondent.

2.4.1 NC argumentation

The survey measures primary two variables regarding NC' argumentation.

1. The internal relations between the arguments, i.e. the weight of each separate argument.
2. The total value of given arguments, measured in the key figure DG.

In order to measure the internal relation between arguments given for exceeding the 1.0 DG the NC ranks a set of stated arguments. They also have the possibility to add own arguments. Referring to the stated arguments, primary CEO or secondary Senior Net Officers of the NC are asked to value their stated model in terms of DG. The value of the unique argument and the value of sum of arguments are now identified.

2.4.2 Assumed customer preferences and Stated Preference

The second part, presumptions of customer preferences, shows weights of stated attributes among NC regarding how they believe their customer companies' experiences their own power consumption.

This part of the survey is designed using a Stated Preference (SP) approach. Stated Preference methods have been used for many decades (Bateman et al, 2002) and the objective is often to study economic values of, for instance, "technically divisible set of attributes of an environmental good" (Champ et al, 2003). Basically the idea is that a good can be described in terms of attributes or characteristics and the advantage using this method is that different attributes can be combined, thus there is great flexibility in the method. There are a number of different SP techniques and one of them is called Choice Modelling (CM). Choice Modelling, which is the chosen technique, involves ranking of options each of which contains a varying set of characteristics, including a money price or cost. CM consists of five different techniques and those are:

- Choice Experiments
- Contingent Ranking
- Contingent Rating
- Paired Comparisons

These different techniques are also known as conjoint analysis and were first used in market researches and transport areas and it has first in recent times been used in other areas (Bateman et al, 2002).

2.4.2.1 Choice Experiment

Generally, in a choice experiment questionnaire, the respondent is presented with a number of different questions and is asked to choose the alternative that is most preferred. Av advantage with this type of questionnaire is that the respondent has to trade-off changes in attributes against the cost. Also, "how people respond to highly complex survey questions is unknown" (Champ et al, 2003) There are several convincing motives why economists should be interested in using stated preference.

- The good is not traded in the real market place
- Explanatory variables have little variability in the market place (Jordan et al, 2000).

To get a reliable and valid model of how behaviour will change in response to changes in variables, SP is used as a part of the survey. The SP techniques are extremely applicable to the valuation of public goods for which no market exist, which is the case of power distribution.

2.4.3 Stated Preference in the main survey

2.4.3.1 Cyclical design

In the second part of the survey, choice experiment is used instead of contingent ranking. This because it is easier for the respondent to use and interpret the scenarios, and the straightforward analysis compared to contingent ranking. Electricity distribution is further not traded at a real market place. A disadvantage is that it contains less information. The choice experiment model used is of a so called cyclical design with binary logit which means that the respondent is faced with two alternatives containing attributes in different levels.

2.4.3.2 Attributes

Below, the different attributes (also called *variable*) are shown. The abbreviations at the left side of the table substitutes:

AAVB	In advance announced interruption
OAVB	Not announced interruption
KVAL	Quality of electricity
CUSTOM	Customer service
PRIS	Price

Table 1, Attributes being measured in the survey.

The attributes are chosen as a result of the preliminary survey.

2.4.3.3 How to interpret the result

The result which is to be interpreted contains some coefficients which can not directly be understood by interpreting the coefficient individually, this because it is a discrete model. However, the mutually ratio between the coefficients can be interpreted. An attribute with

a value twice as high than another attribute is also twice as important as the other attribute (|coefficient|).

The sign (+/-) tells if an attribute is considered to have a positive/negative importance, not negative or positive as a quantification, but as a subjective value. A negative sign could i.e. be interpreted as a attribute with a negative impact, vice versa a positive sign could be interpreted as a attribute with a positive impact.

Let us explain by an example.

Variable	Coefficient	Marginal effect	P[|Z|>z]
X	-.6132627351	-0.08675	.0000
Y	-1.388878127	-0.16658	.0000
Z	1.204314449	0.07562	.0002

Table 2, Example of how interpreting the result of a Stated Preference

Y is of most importance, followed by Z. Z is stated to be of positive subjective value, while both X and Y are of negative value. Further, X is proximally half as important as Z.

The marginal effect indicates the change of the coefficient on the margin and the right side of the table, P indicates the significant of the attribute, the closer to zero the higher significance.

2.4.4 Validity and reliability of the main survey

The population of Swedish NC is proximally 180 companies. This is a relatively small population, which means that the survey could be, and is, sent to each and everyone, excluding NC that were chosen to participate in the preliminary survey. By excluding these companies, bias is avoided. The number of responding NC to each and every asked question is presented in the analysis. The reply frequency is generally low, this as a consequence of time shortage. With that, it can be concluded that the study does not give a all-embracing picture of the NC response and attitudes.

Knowing that the second part of the main survey, presumptions of customer preferences, will both be used in a later survey and as a part of this paper, it is reasonable to question

its affects on validity and reliability. Could not stated questions that are to be used in another survey affect this papers validity and reliability negatively? The answer is yes, but this paper is, as explained in aim and scope, completely covered by the later report. No parts in this paper diverge from the coming report, thus validity and reliability is not affected. Further, the stated preference part of the survey does not measure the same variables that are measured in other parts of the survey which means that the risk of overlapping interference is minimal.

Question number 6 in the main survey is late discovered not generating sustainable value to this study. The question is simply not measuring the desired variable. The affect from a superfluous question on validity and reliability is hopefully of none or marginal significance.

2.4.4.1 Survey questions

The first part of the main survey is divided into two sections, categorizing and attitude questions. Each question is motivated benith.

Presentation and motivation of questions	
	Which DG did your NC get in the Energy Agency latest testing of the NUM?
1.	In order to relate the nc arguments to their dg.
	What kind of owner structure does your company have?
2.	In order to identify relations between nc arguments ans owner structure.
	How many customers do you have in total (thousands)?
3.	In order to categorize nc by size.
	How much electricity (GWh) ran through your net during 2003?
4.	In order to categorize nc by size.
	How large proportion of your customers is constituted by private persons?
5.	In order to categorize nc customers.
	What kind of structure does your net have (cable/wire)?
6.	In order to identify realtion between net in population centres and sparcely populated areas.
	In which extent do you believe that your net differs from the fictive net that the NUM creates?
7.	In order to measure the belived error in the NUM.
	What DG do you consider as fair for the Energy Agency to request the individual NC to develop a plan of action in order to lower the DG?
8.	In order to measure what db nc conciders as legitime.
	What DG do you consider fair for the Energy Agency to order the individual NC to compensate the subscriber for unreasonable tariffs?
9.	In order to measure what db nc conciders as legitime.
	Suppose that your NC has a DG that by the Energy Agency is considered to be to great and that they therefore has ordered you to pay the money back to the subscribers. You have on the other hand the possibility to argue in order to keep current income level. You posses 100 credits in order to distribute on stated arguments on the basis of their importance.
10a.	**Mark how many of these credits you want to dispose on respective argument.**

	In order to quantify arguments value. **After presenting your argument to the Energy Agency according to question 10, how much could you lower your DG?"**
10b.	In order to quantify arguments value. **At what DG do you believe that you NC is making use of its monopolistic position?**
11.	In order to measure what db nc conciders as legitime. **Suppose that your NC has a DG of 0,95 accordingly to the NUM. State how that would affect your will to invest respectively price structure.** **Our total price level will the nearest five years period, in comparison with the last five years:** **Our investments will the nearest five years period, in comparison with the last five years:** **(decrease)(not changed)(increase)**
12.	In order to measure nc future plans regarding price and investment, is related to the nc db.

Table 3, Presentation and motivation of questions in the first part of the survey.

3 Results

Results are stated and later analysed. By combining certain results, results that can answear the studys aim are generated. Further, Stated Preference is connected to earlier analysis and a conclusion is presented.

3.1 Comprehensive analysis

The survey is divided into three parts – classification, attitude and stated preference, the stated preference analysis is presented separately.

3.1.1 Classification

Question 1 considers the DG stated in the latest test run conducted by the Energy Agency. The majority of the NC that answered the question has a DG above 1,0. It could be assumed that NC that already exceeds the 1,0 DG eager to present their arguments motivation their DG. The DG is crucial importance in the analysis of this survey.

classification		frequency	proportion
1.	<1,0	11	0,282
2.	≥1,0	28	0,718

Table 4, "Which DG did your NC get in the Energy Agency latest testing of the NUM?" (n = 39)

Question 2 considers owner structures in the NC. A significant part of the NC is municipally owned. "Other" is representing both economical associations and mixed owner structures which is a combination of the different owner types.

alternative		frequency	proportion
a.	(privately)	9	0,184
b.	(municipal)	21	0,429
c.	(government)	0	0,000
d.	(other)	19	0,388

Table 5, "What kind of owner structure does your company have?" (n = 49)

Question 3 considers the amount of customers to the NC, measured in thousands of customers. The majority of the NCs have maximally 7500 customers.

In order to get an approximate picture of the NC' size, a couple of questions measure the size from out different perspectives. This image would not be that clear just measuring from on of these perspectives.

alternative		frequency	proportion
a.	(0-7,5)	29	0,592
b.	(7,6-15)	9	0,184
c.	(15,1-22,5)	7	0,143
d.	(22,6-30)	1	0,020
e.	(30,1-37,5)	1	0,020
f.	(37,6-45)	2	0,041
g.	(45,1-)	0	0,000

Table 6, "How many customers do you have in total (thousands)?" (n = 49)

Question 4 considers how much electricity ran through the nets, measured in GWh. The substantial majority of the responding NCs are categorized as small.

alternative		frequency	proportion
a.	(0-200)	31	0,633
b.	(201-400)	13	0,265
c.	(401-600)	2	0,041
d.	(601-800)	2	0,041
e.	(801-)	1	0,020

Table 7, "How much electricity (GWh) ran through your net during 2003?" (n = 49)

Question 5, considers the proportion of private persons among the NC' customer collective. Private persons seem to constitute a significant part of the customer collectives.

alternative		frequency	proportion
a.	(0-20%)	0	0,000
b.	(21-40%)	3	0,061
c.	(41-60%)	3	0,061
d.	(61-80%)	9	0,184
e.	(81-90%)	25	0,510
f.	(91-100%)	9	0,184

Table 8, "How large proportion of your customers is constituted by private persons?" (n = 49)

Question 6 considers the net structure and the biggest part of the nets is cable. The result is a mean value of the net structure of each every NC added together.

alternative	average
a. (cable)	63,447
b. (wire)	36,426

Table 9, "What kind of structure does your net have (cable/wire)?" (n = 47)

3.1.2 Attitude

The questions asked in this section of the survey aims to identify specified attitudes regarding aspects related to the NUM.

Question 7 tells that all NC deem that their net differs from the fictive net that is created by the NUM. The majority thinks that the difference is substantial, or closes to. Despite that a considerable part of the NC believes that the fictive net is fairly close to the real net, it could be expected that a lot of work from the Energy Agency remains before the NC are satisfied with the structure in the fictive net.

The NC takes position in the question by marking their choice on a scale that spans from (differs not at all) to (differs substantially).

alternative		frequency	proportion
a.	(differs not at all)	0	0,000
b.		6	0,122
c.		15	0,306
d.		19	0,388
e.	(differs substantially)	9	0,184

Table 10, "In which extent do you believe that your net differs from the fictive net that the NUM creates?" (n = 49)

In question 8, the NC are classified into 10 categories dependent on what they believe is a fair level of DG trigging a request of developing a plan of action. The most of the NC seems to consider a DG at 1,4 as acceptable.

classification		frequency	proportion
1.	DG < 1,1	1	0,029
2.	1,1 ≤ DG < 1,2	4	0,114
3.	1,2 ≤ DG < 1,3	12	0,343
4.	1,3 ≤ DG < 1,4	9	0,257
5.	1,4 ≤ DG < 1,5	4	0,114
6.	1,5 ≤ DG ≤ 1,6	3	0,086
7.	1,6 ≤ DG < 1,7	2	0,057
8.	1,7 ≤ DG < 1,8	0	0,000
9.	1,8 ≤ DG < 1,9	0	0,000
10.	1,9 ≤ db	0	0,000

Table 11, "What DG do you consider as fair for the Energy Agency to request the individual NC to develop a plan of action in order to lower the DG?" (n = 35)

In question 9, the NC are classified into 10 categories depending on what they believe is a fair level of DG for the Energy Agency to order the individual NC to compensate the subscriber for unreasonable tariffs. Many NC believes that DG up to 1,6 are acceptable. In other words quite far from the DG of 1,0 that the NUM originally argued is acceptable.

classification		frequency	proportion
1.	DG < 1,1	0	0,000
2.	1,1 ≤ DG < 1,2	2	0,063
3.	1,2 ≤ DG < 1,3	4	0,125
4.	1,3 ≤ DG < 1,4	4	0,125
5.	1,4 ≤ DG < 1,5	0	0,000
6.	1,5 ≤ DG ≤ 1,6	12	0,375
7.	1,6 ≤ DG < 1,7	3	0,094
8.	1,7 ≤ DG < 1,8	1	0,031
9.	1,8 ≤ DG < 1,9	0	0,000
10.	1,9 ≤ db	6	0,188

Table 12, "What DG do you consider fair for the Energy Agency to order the individual NC to compensate the subscriber for unreasonable tariffs? (i.e. compensate the subscribers for earlier paid fees" (n = 32)

Question 10 values the arguments presented to the Energy Agency motivating an exceeded DG. Together with question 1, this question constitutes the core of this study. The question is divided into to sub questions, a) and b).

a) Measures the mutual influence among the stated arguments. The NC has to value 10 different arguments; they also have the possibility to add own arguments, presented in the "other" wedge.

list of fully labelled arguments	
1.	Greater need of building the net around natural obstacles than the NUM allow.
2.	High degree of movement/intensions of moving within the customer collective
3.	Negative growth of the customer collective
4.	In purpose of research and development are we making (or has done) extraordinary investments in order to, in the future, better meet customer needs and desires.
5.	Our customer collective is more sensitive to power failure and/or defective quality of delivery, than customers are in general.
6.	Restructuring costs connected to merging or splitting nets.
7.	Costs of regional nets.
8.	Owners demand of return.
9.	Earlier made investments in current or new capacity affects current cost level.
10.	We have already taken measures, but the effects will not be noticeable until a couple of years.

Table 13, List of fully labeled arguments.

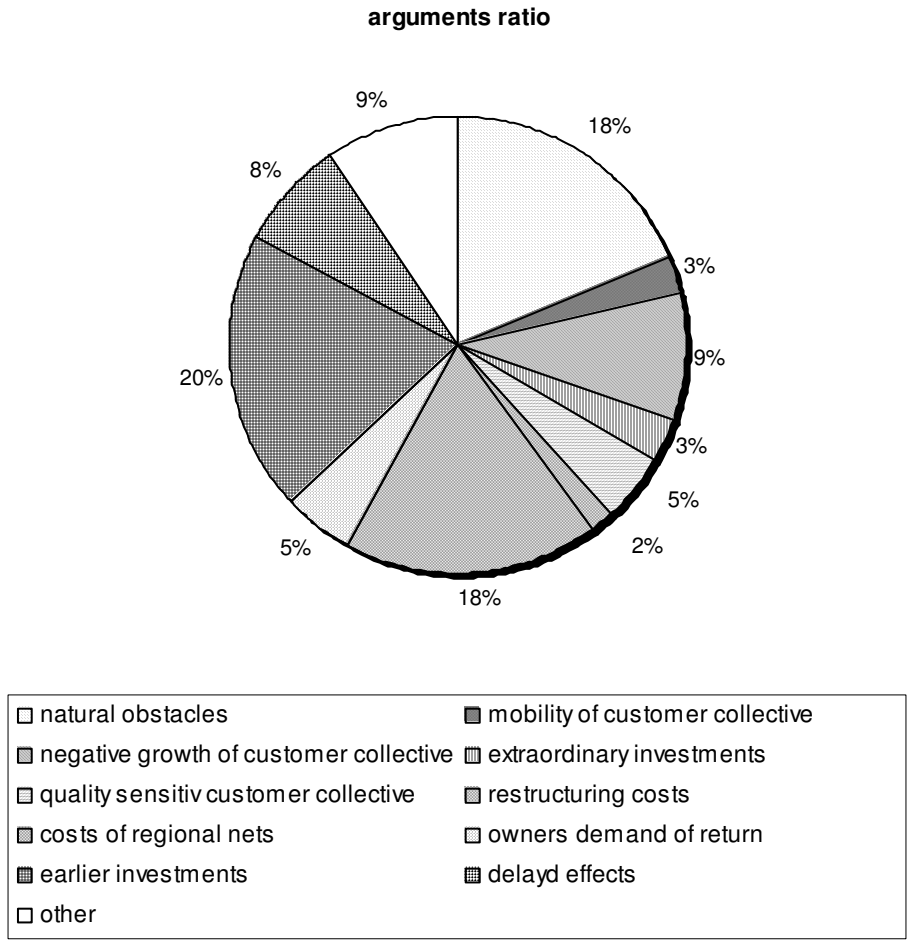

Figure 2, "Suppose that your NC has a DG that by the Energy Agency is considered to be to great and that they therefore has ordered you to pay the money back to the subscribers

You have on the other hand the possibility to argue in order to keep current income level. You posses 100 credits in order to distribute on stated arguments on the basis of their importance. Mark how many of these credits you want to dispose on respective argument." (n = 44)

In particular, three arguments are more often referred to than others – earlier investments (20 %), natural obstacles (18 %) and costs of regional nets (18 %). The 9 % "other" are arguments that are stated dominates by customer demands (18 %), followed by data gathering (14 %), preventive investments (13 %) and reduced price level (13 %).

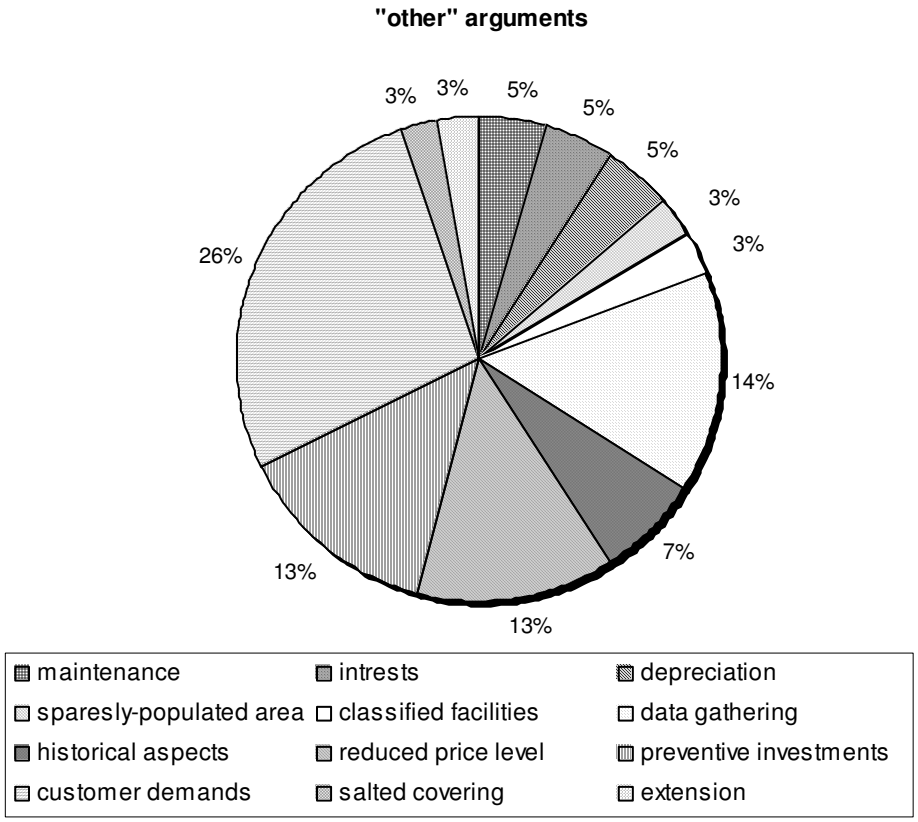

Figure 3, Ratio between arguments given as "other"

b) States how much the sum of given arguments is worth, measured in DG. Not many NC believe that they arouse enthusiasm for their arguments. The believe is that given arguments are worth 1,0 in DG as a maximum.

The NC takes position in the question by marking their choice on a scale that spans from (<0,1) to (>1,0).

alternative		frequency	proportion
a.	(<0,1)	12	0,273
b.	(0,1)	12	0,273
c.	(0,2)	3	0,068
d.	(0,3)	11	0,250
e.	(0,4)	2	0,045
f.	(0,5)	4	0,091
g.	(0,6)	0	0,000
h.	(0,7)	0	0,000
i.	(0,8)	0	0,000
j.	(0,9)	0	0,000
k.	(1,0)	0	0,000
l.	(>1,0)	0	0,000

Table 14, "After presenting your argument to the Energy Agency according to question 10, how much could you lower your DG?" (n = 44)

No NC believes that the value of their arguments exceeds or equals 0,6 in DG. More than 50 % means that their arguments is worth less than 0,1 DG. Close to 40 % values their arguments comparatively positively. What's really interesting is connecting given value of arguments to the actual DG.

Question 11 tells that roughly 40 % of the responding NC considers 1,5 as the DG where the NC starts to make use of their monopoly position. The question functions as a verifier to question 9 that is similar. Worth mentioning is that more NC believes that the limit is below 1,5 than above. Still, 18 % of the NC argues that a DG equal to 1,7 or higher is a fair DG.

The NC takes position in the question by marking their choice on a scale that spans from (1,0) to (2,0).

alternative		frequency	proportion
a.	(1,0)	0	0,000
b.	(1,1)	1	0,023
c.	(1,2)	5	0,114
d.	(1,3)	5	0,114
e.	(1,4)	4	0,091
f.	(1,5)	17	0,386
g.	(1,6)	0	0,000
h.	(1,7)	3	0,068
i.	(1,8)	1	0,023
j.	(1,9)	1	0,023
k.	(2,0)	0	0,000
l.	(>2,0)	3	0,068

Table 15, "At what DG do you believe that you NC is making use of its monopolistic position?" (n = 40)

Question 12, the last question, measures the NC believes regarding their future pricing and investment strategies. The two alternatives increases, decreases or are unchanged and the NC is to choose the alternatives they believes are most probable. More than the half of the NC believes that current pricing level will follow Consumer Price Index, but the investment level will either remain unchanged or increase. Also, this question is most relevant to relate the DG.

alternative	
pricing level	**investment level**
1. decrease	1. decrease
2. follow consumer price index	2. unchanged
3. increase	3. increase

Table 16 "Suppose that your NC has a DG of 0,95 accordingly to the NUM. State how that would affect your will to invest respectively price structure.

Our total price level will the nearest five years period, in comparison with the last five years: (decrease)(follow CPI)(increase)

Our investments will the nearest five years period, in comparison with the last five years: (decrease)(not changed)(increase)" (n = 49)

classification		frequency	proportion
1.	1:1	0	0,000
2.	1:2	0	0,000
3.	1:3	2	0,041
4.	2:1	2	0,041
5.	2:2	15	0,306
6.	2:3	12	0,245
7.	3:1	2	0,041
8.	3:2	7	0,143
9.	3:3	9	0,184

Table 17, Responding NC ratio between price and investment.

3.2 Analysis of combined questions

The NC could be assumed to present different arguments and future strategies depending on current DG. The NC are divided into two explicit groups, NC with a <1,0 DG or a ≥1,0 DG, stated in question 1.

The NC's DG related to stated arguments

NC that have the feeling that they exceed the DG which will be applied, when the NUM is considered fully operational, might maybe tend to use other arguments than those that are below that level. As said earlier in the paper, some arguments are more practical to their nature and therefore easier to quantify. On the other hand there are theoretical arguments that are nearly impossible to quantify to constants independent of time.

	1	2	3	4	5	6	7	8	9	10	11
total	16,7%	2,3%	10,5%	3,2%	3,9%	1,8%	18,8%	5,4%	18,5%	7,3%	11,7%
<1,0	11,0%	3,0%	14,5%	0,5%	3,0%	0,0%	22,0%	8,0%	17,0%	6,0%	15,0%
≥1,0	18,8%	2,0%	8,9%	4,3%	4,2%	2,5%	17,5%	4,4%	19,1%	7,8%	10,4%

Table 18, Mutual ratio (%) between arguments, responding NC are categorized by DG.

The bar chart shows the mutual relation between the arguments that are presented separately for the all respondents, those <1,0 DG and those ≥1,0 DG. The weight of natural obstacles is nearly twice as high among ≥1,0 DG NC (NC). Natural obstacles form a relatively important part of the arguments. ≥1,0 DG NC deems that a negative growth of the customer collective is of lesser importance than the <1,0 DG NC believe. A negligible number of the <1,0 DG NC deems that extraordinary investments constitutes a argument while ≥1,0 DG NC brings out its relevance in a much higher degree, but still

relatively small compared to the sum of arguments. In the same manner, ≥1,0 DG NC brings relevance to restructuring cost, yet in a lesser degree. Both groups emphases the importance of costs of the regional nets and costs from earlier investments. These two groups is among the arguments which weights most heavily. <1,0 DG NC considers owners demand of return is of ca. twice the matter, comparing to the ≥1,0 DG NC which makes the argument to a medium sized argument. Delayed effects of earlier investments is an argument in the same size, but with vice verse distribution between the DG. Among other arguments, customer demands constitutes a fourth of the total value.

Except from natural obstacles, no major arguments constitute crucial difference in their ratio to the arguments in respective category of DG. From this point of view, systematic differences between the two categories could according to the analysis of the chart be identified. Why these differences exist is discussed later.

It shall be mentioned that arguments within the group "other" are not treated separately within the bar chart, but as a homogenous group. Arguments included in the category "other", are presented without separation between ≥1,0 and <1,0 DG, which means that the same argument affects both bars. These arguments get few hits since they are presented by unique NC.

Each arguments value quantified in DG related to the NC's DG.

We have now seen the arguments mutual relation, but how much are the arguments, accordantly to the NC, worth in DG? Its reasonable to assume that ≥1,0 DG NC puts more value and importance in their argumentation than the ones >1,0, further, arguments that are difficult to quantify might perhaps be preferable to use by these companies that are in need of good arguments.

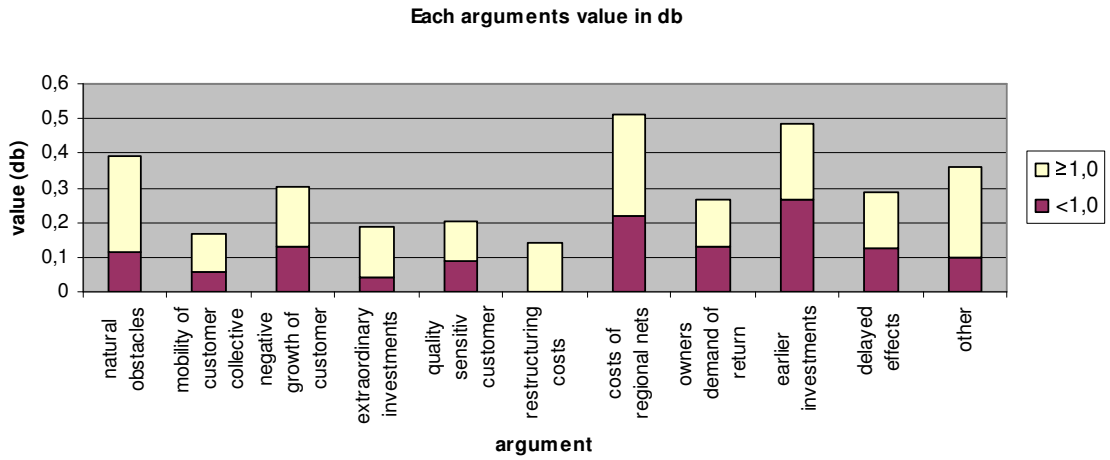

Figure 4, Given arguments, valued in DG and categorized by the responding NC DG.

The top four arguments – natural obstacles, cost of regional nets, earlier investments and other – are all individually worth 3,0 or more in DG. Natural obstacles and costs of regional nets are arguments that would be quantified with a relative ease by the regulator. Despite that, the ≥1,0 DG NC focuses quit heavily on these arguments, putted in relation to the NC below 1,0. In difference to the <1,0 db NC, the also puts a substantial value into extraordinary investments and restructuring costs, where later is practically not related to by the <1,0 db NC. Arguments classified as "other" are dominated by arguments that are hard or even impossible to quantify, except for data gathering costs, which is a kind of opposite to two of the others top four arguments. Both groups' puts proximally equal value into quality sensitivity among customers, owners' demand of return and delayed effects of earlier investments. It could not be stated that the ≥1,0 DG NC primary puts value into hard-measured arguments. The most important arguments are partly arguments directly related to the nets.

The ≥1,0 DG NC puts systematically more value into their argumentation than those below 1,0 in DG. It is natural that those who exceed a stated limit, puts efforts in getting their situation legitimated, or tries to get below the limit. When most of the NC considers that DG above 1,0 are acceptable, it is probable that the value of the arguments stated by the ≥1,0 DG NC neutralizes the NC already high DG. It could clearly be stated that the ≥1,0 DG NC do not accept 1,0 db as a line which exceeding means making use of their

monopolistic position. From this perspective, it is clarified that customer benefits and company profits which the neo-classical theory matches against each other, are not in balance where the NUM, as a regulating model of a natural monopoly, in the theory tells that they shall.

NC's assumptions regarding future price- and investment levels at a DG of 0,95 related to the responding NC's DG.

When the NUM according to neo-classical theory strives for keeping a balance on a competitive market (or at least with fictive competition created by a regulation model) at the 1,0 DG, this means that price incensement are legitimated up to that level. In theory, NC below 1,0 in DG could therefore gladly in pure profit maximizing purposes plan future price level increase, presupposed that no moral or ethical exist. Could a tendency showing that <1,0 DG NC in the future are to raise their price level be identified?

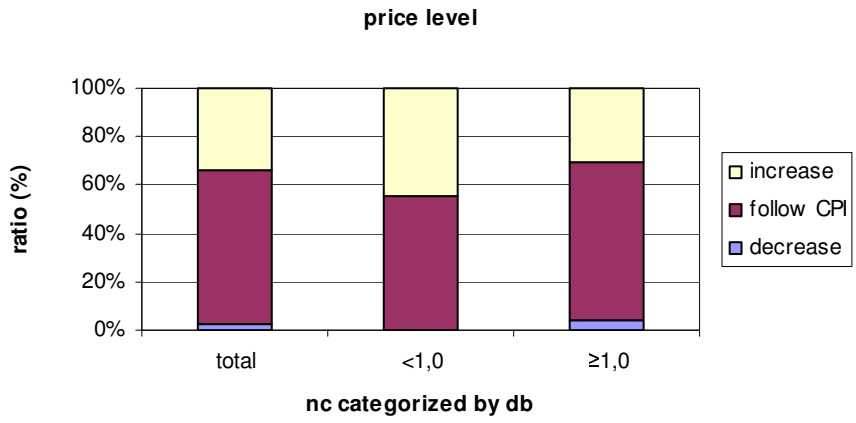

Figure 5, Pricing tendency at a DG of 0,95 categorized by the responding NC DG.

A bigger share of the NC below 1,0 thinks that the price level will increase matched up to to current level, compared to the that ≥1,0 DG NC, thus, the difference is limited. Still, a narrow majority among <1,0 db NC believes in following CPI. None of the <1,0 db NC thinks that they will decrease their price levels, a marginalized part of the ≥1,0 DG NC believes in a lowered price level.

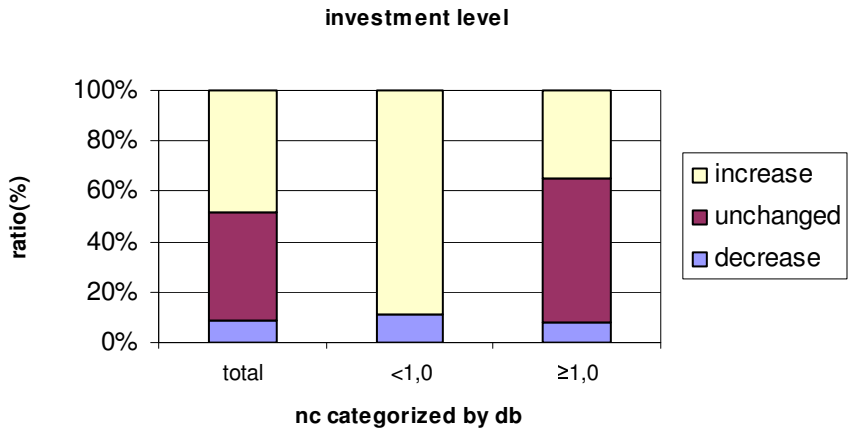

Figure 6, Investment tendency at a DG of 0,95 categorized by the responding NC DG.

None of the responding NC below 1,0 in DG believes in a unchanged investment level. A significant majority deems instead that the investment level will increase while proximally 50 % of the ≥1,0 DG NC plans to keep the investment level unchanged. A minority in both sectors predicts a decreased level of investment.

There are apparently a greater group of NC among the <1,0 DG companies then there are among the ≥1,0 DG NC that are planning future raises in price, but the difference is not convincing. However, almost each and every NC with <1,0 DG states that their future investment level will increase. Direct increases of the price level would be difficult to perform due to customer reactions. In purpose to attain legitimacy, it would be convenient to hide the price increases behind the investments. Still, from a purely business economic perspective it is in purpose to maximizing the profit legitimized to increase the price level.

Among ≥1,0 DG NC, the correlation between pricing and investment is far more obvious. To follow the 1.0 limit that the NUM in the theory states, these NC should consider lowering their prices, which obviously not is the case.

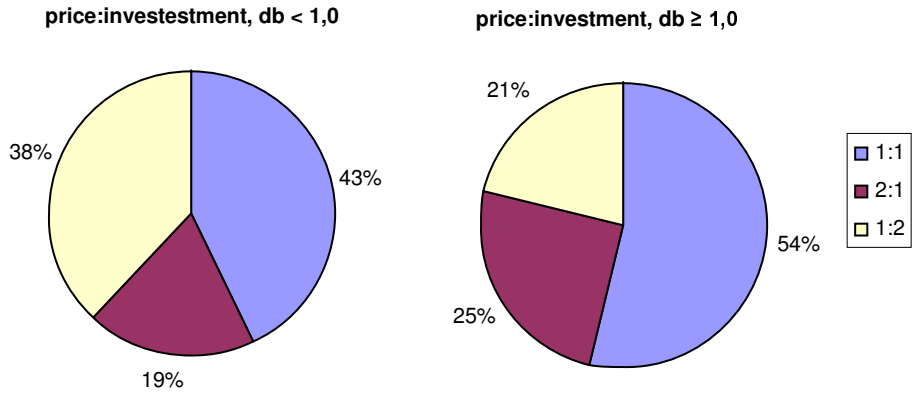

Figure 7, Computed ratio between price and investment when categorizing nc by db.

54 % of the ≥1,0 DG NC keeps their ratio between price and investment (1:1) while only 43 % does the same among the < 1,0 DG NC. The gap is mainly replaced with NC with an increasing share of investment (1:2). A six percentage point's bigger share, compared to the <1,0 db NC, of increasing price level compared to share (2:1) of investment among the ≥1,0 DG NC is identified.

Analyzing upcoming changed in future price- and investment level ratios it is clear that the < 1,0 DG NC not are planning to raise their price level in ratio to their future investment level more than vice versa. Among the ≥1,0 DG NC the 2:1 ratio is of greater importance which argues against that primary <1,0 db NC has a 2:1 ratio.

The substantial majority of the responding NCs are categorized as small. Therefore, relations between a NC's size and other variables measured in this study could not be analyzed. It could be claimed that the study primary refers to small NC. Upholding that the study also analyses large NC situation would be a wrong.

3.3 Analysis and discussion of stated preference

As said earlier, attributes used in the survey can just be related to each other, i.e. the mutual ratios could only tell the importance of the attributes relatively each other and not relatively external factors.

The results of the Stated Preference are as follow:

Variable	Coefficient	Marginal effect
AAVB	-.7232627351	-0.08675
OAVB	-1.388878127	-0.16658
KVAL	1.204314449	0.14444
CUSTOM	.6305347006	0.07562
PRIS	-1.137308340	-0.13641

Table 19, Results from the Stated Preference

Mutually assessed the unannounced interruption is seen as the most important factor presumed by the NC. As second attribute quality is chosen and as third, price. Forth is in advance announced interruption and not announced interruption are of least importance. For example, the NC believes i.e. that their customers considers OAVB more than twice as important as CUSTOM, $\frac{|\text{OAVB}|}{|\text{CUSTOM}|} > 2$.

Let us pay more attention to attributes relative to PRIS, starting with the ratio between OAVB and PRIS. The importance of OAVB is considered to be greater the importance of PRIS. This could be interpret as that the NC believe is that the companies could consider to take a higher price and in return get fewer not announced interruptions. In the same manner, PRIS is identified to be off less importance relatively to KVAL. Customers should in other words be more sensitive to the quality of electricity than the price they pay. Still, KVAL not as important as OAVB. Both OAVB and KVAL are of higher importance than PRICE, i.e. electricity of good quality and with as few not announced interruptions as possible are worth paying for. That AAVB is ranked at second bottom attribute is not surprising, the NC seems to be confident with the companies ability to re-plan and reschedule their operations and for that reason are presumed to consider this attribute to have a minor impact. Related to price, the companies are absolutely not interested in paying a higher price in order to reduce announced interruptions.

3.3.1.1 Discussion

In order to get a better understanding of the mutual importance of the attributes, but above all, to discuss a possible connection to the context, an explaining scenario is

presented. The scenario is just an attempt to make the stated connection and shall be seen as a discussion.

Today, western society has made itself dependant of electricity, production lines etc. are directly dependent of electricity distribution of a certain quality which is crucial attribute among high electricity-consuming companies. Not announced power failures, which are the highest valued attribute, are most inconvenient and could often result in reduced, or in worst case stopped, production with both direct and indirect costs as a consequence. An example from the real world, the power failures in Kista, Stockholm, resulted in significant data losses within LM Ericsson's R&D. Power failures that could be stopped from occurring if the quality if distribution were higher. As second most important attribute comes quality of electricity. Many industries are dependant of a good quality on the delivered electricity, which is understood by the high rank. For example, SKF, that in their factory in Gothenburg has equipment that is extremely sensitive to disturbances in the electricity. In the same manner as interruptions, a insufficient quality of electricity could in the worst case lead to production losses when operations has to be re-planed and rescheduled due to stop in the machinery.

Since Sweden has low electricity prices (INRA, 2002) price should be expected to be of less importance. The demand of electricity of good quality and with few not announced interruptions is also, as said, demanded. These two factors together puts price as third. The two attributes with less importance in the SP survey are announced power failures and customer service. Announced power failures are not considered as bad as unannounced failures. Then companies have time to plan and prepare for the upcoming power failure, the attributes low relatively low relevance is not surprising. Customer service is the least attribute with lowest relative importance. Companies with high electricity consumption have often agreements of how this service shall be performed and managed, thus the attribute loses importance.

3.4 Conclusions

The net companies argue that the net model widely diverges from the real net and the net companies think that they can present different arguments to reduce the debit degree. Even if the Energy Agency considers many arguments in the NUM, there is an opinion among the net companies that they are not compensated enough. This in combination with a majority of our analysed arguments can be interpreted as a systematic failure in the model.

Comparing these arguments to the part of the study regarding SP it can be stated that the net companies assume that the customers give priority to quality before price. Despite of this fact the net companies choose to emphasize on arguments connected to the net and its technical/natural structure. This means that the net companies do not emphasize the believed needs of their customers, but on their own.

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