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Compulsory Purchase: – Reasonable and Fair Compensation

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Abstract. *Swedish law provides that compensation for compulsory purchase – in some cases – shall be decided according to the following general principle: The compensation should correspond to the price that could have been expected if it had been a "normal voluntary transaction". However, in those specific situations where compulsory purchase applies, there is always a lack of empirical data of price levels in voluntary agreements. In this article we enlighten the problem through bargaining experiments with buyers and sellers. We provide experimental evidence from Sweden indicating that the price level – or the profit-sharing between buyer and seller – depends on the context and what is judged to be reasonable principles of fair distribution.*

Keywords*: Compulsory purchase, expropriation, compensation, profit-sharing, bargaining experiments.*

1 Introduction

In many countries the compensation to be paid when expropriation – or compulsory purchase – is used, shall be based on a principle of indemnification. The property owner shall be compensated for the damage he suffers. In other words, the basic idea behind the rules of compensation is that the seller shall be in the same economic position as if the compulsory purchase had never happened (see e.g. Erasmus, 1990).

This is the main principle also in Sweden. The provisions in the Expropriation Act states that the compensation shall correspond to the *market value* of the property.[1] When only part of the property is affected by compulsory purchase, the com-

[1] Definition of the market value is not without its problems, but space will not allow us to consider this any further. Instead see Lind (1997). Nor will space permit us to describe valuation methods which can be used for estimating the market value in different situations.

pensation must equal the *loss* of market value which the compulsory purchase entails. If this compensation does not fully cover the economic injury to the property owner, compensation shall also be paid for what is termed *other damage*.[2]

The rules in the Expropriation Act always apply if the compulsory purchase is of an "expropriatory nature". This is primarily the case with a transfer of land which is designated for a state/municipal purpose, e.g. roads, railroads, electrical powerlines. However, Swedish law also permits "private compulsory purchase" in some cases. i.e. these purchases primarily concern relations between individual properties/persons. A common case is *plot formation* for the purpose of creating or enlarging properties intended for building development. Cases of this kind also include the creation of easements in order to provide the plots with necessary roads, utilities etc.[3]

For the non-expropriatory purchases, the Real Property Formation Act lays down that, also in cases of this kind, the seller is to be compensated for the reduction of market value. But in addition, when fixing the compensation, "reasonable allowance" shall also be made for the value of the land to the buyer. The *travaux préparatoires* of the Act state that the compensation should correspond to the price that could have been expected if it had been a *normal voluntary transaction.*[4]

But how is the price determined in "normal voluntary transactions"? That is the question that will be illuminated in this article.

2 What will the price be if a property is sold voluntarily?

The starting point for a discussion of voluntary land transfer lies in the following observations concerning property transfers in general. In order for the sale of a property to materialise in the first place, buyer and seller must value the property *differently*. In order for the seller to be prepared to part with the property, the buyer must pay a price at least equalling the value put on it by the seller. At the same time, of course, the buyer is not prepared to pay more than the value which he himself puts on the property. In other words, there must be an agreement on price between the values put on the property by seller and buyer.

The "profit" resulting from a voluntary sale can be seen as the difference between the values put on the property by the buyer and seller. If the price comes close

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[2] Compensation for "other damage" may come into question, for example, when a property owner has to move house or close down a business conducted on the property.

[3] The same applies to land for communal facilities (*gemensamhetsanläggning*), which are facilities common to several property units and managed by the property owners themselves. Facilities of this kind come under the *Joint Facilities Act*. Reallotment of agricultural and forest properties, i.e. land transfers and changes in the easements and joint property unit shares of properties in rural areas, is also labelled "non-expropriatory".

[4] A higher compensation when private compulsory purchase occurs, compared to the compensation for "normal" expropriation, is in line with e.g. Epstein (1985). Epstein argues that private parties should be given expropriation power. But private compulsory purchase may, in order to be legitimate, require a higher compensation level, i.e. a profit-sharing.

to the seller's valuation, the buyer will have a bigger share of the profit. Conversely, the closer the price comes to the buyer's valuation, i.e. the higher the price, the greater the seller's share of the profit will be (see Figure 1).

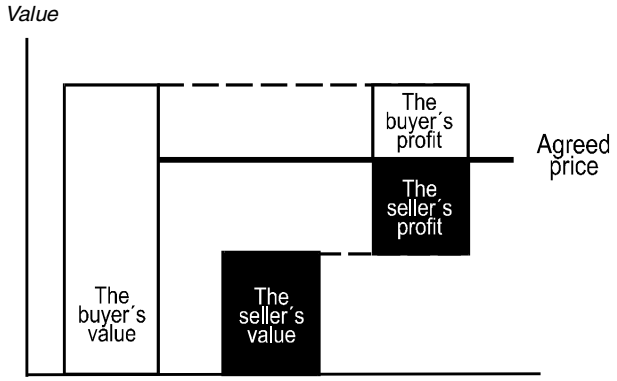

Figure 1. *Profit-sharing and voluntary transactions.*

The same argument can also be applied to parts of a property which are transferred to another property (or to an easement created in one property in favour of another). In order for a voluntary transfer to take place, the land must be differently valued by the parties respectively acquiring and parting with the land. And the price must come somewhere in between those two values.

We can then see two theoretical assumptions about human behaviour in negotiations. Some argue that individuals are "gamesmen" – just trying to get as much for themselves as possible. In that case, if the negotiation positions of the parties are equally strong, one could expect them to meet half-way, i.e. they split the profit equally.[5] Other argue that subjects´ behaviour in many situations is decisively influenced by moral principles and questions of fairness.[6] The results that will be presented in this article are inconsistent with both these simple theories, but in line with the following more complex theory about fair bargains in Young (1991, pp. 4–5)*:*

"The negotiators search for some generally accepted principle or standard – customary shares, splitting the difference, reciprocity – that allows them to come to closure while avoiding a contest of wills that may cause the negotiations to break down. By appealing to standards of fairness, the negotiators increase the likelihood of an agreement by narrowing the range of possible disagreement. A further benefit of relying on standards of fairness is that it relieves the bargainers of responsibility for having "given in."

[5] See e.g. Trefzger & Munneke (1998).

[6] See for example Güth and Tietz (1990), Bolton (1991), Prasnikar and Roth (1992), Spiegel et al (1994), Roth (1995) and Fehr and Gächter (2000).

3 The Method – Bargaining Experiments

As long as it is possible for one of the parties to use legal means, as in Sweden, there exist no actual "normal voluntary transactions". Thus we have no empirical information from the market about price levels and how profits are split between buyers and sellers. However, one way to shed light on this issue is bargaining experiments.

We believe that experiments can be of more general interest to real estate surveyors, economists and lawyers. First, they illustrate how experiments can be used to increase our knowledge of how markets work and what determines people's actions in a real estate context. While the use of experiments has increased very rapidly in general economics, only a few experimental studies concerns real estate economics. Most experiments that have been carried out concern uncertainty and bias in property valuations (see e.g. Diaz, 1999). Experiments make it possible to isolate single aspects and ascertain how people's behaviour changes with specific aspects of a situation. The experimental studies are therefore an interesting complement to statistical analysis of "real data" – where it is difficult to isolate the role of a single factor – and analyses of theoretical models – where the relation between assumed behaviour and behaviour of real people can always be questioned. Of course, experimental studies have their own problems, mainly concerning how far the results can be generalised, and the studies should therefore be seen as a complement and not as an alternative to traditional studies.

3.1 Experimental Design

The participants: Our experimental sessions have been carried out between 1993 and 2006, and the participants have been students in the School of Surveying at the Royal Institute of Technology. During an ordinary lecture they were given the opportunity to sign up for an economic experiment. They were told that the experiment concerned economic decision-making, that it would last around one hour and that they could earn some money if they participated. No details of the topic were given.

The sessions: In each session there were about 20 to 50 participants. In each session 1–3 different cases were used. Most of the cases were used in several sessions (with different participants). The participants were randomly divided into "buyers" and "sellers". These two groups were seated in different rooms and negotiated through written messages, without knowing the identity of the person they bargained with. They were informed that the bargaining lasted a maximum of four rounds. If they had not reached an agreement in round four, their earnings – paid by us – would be zero. Both parties wrote a message simultaneously in each round. This message consisted of a bid for the buyer and an price asked by the seller (hereafter labelled "ask"). The participants could also write down arguments showing why the bid/ask was reasonable or any other message, except messages that would make it possible to identify the participants. A deal was closed when the bid-ask spread was smaller than a certain amount specified in advance (between 2.5% and 5% of the profit depending on the case). The average between the bid and the ask would then count as the agreed price.

In the first round the participants had eight minutes to complete bid/ask and the message. This time was reduced in later rounds as we expected that the participants then had gained better knowledge of the situation and needed less time.

The participants' incentives: In the instructions the participants were informed that their earnings would be a linear function of the profit that they made. They higher the profit, the more they would be paid. They also knew that they could earn around 100 SEK – around 10 EURO – if they were good at bargaining. For more details concerning the experimental design, see Kalbro and Lind (1999).

4 Formation of Building Plots

The typical building plot formation case can be described in the following way. Initially we have two properties, property A and B, with different owners. According to the new plan three new building plots are allowed. Plot 1 is owned by property owner A and plot 3 by property owner B. Plot 2, however, consists of one part from property A and one part from property B. These parts are called A_{P2} and B_{P2}. In order to create plot 2 we now assume that the owner of B wants to buy A_{P2}.

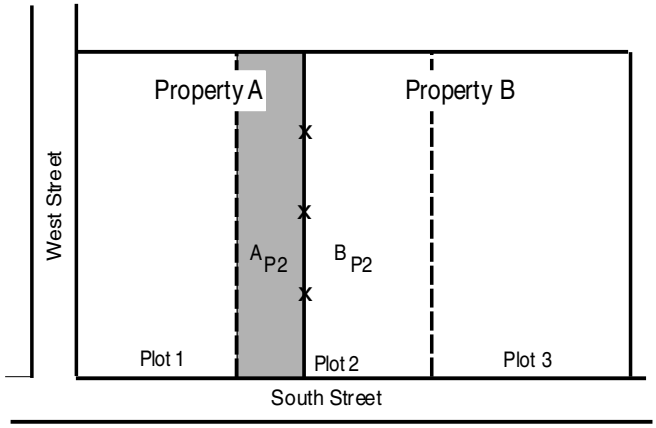

Figure 2. *The typical building plot formation case.*

Assuming that there are no transaction costs and no differences between market values and the property owners individual values (or their reservation prices[7]) we have:

$$R = P_{P2} - (P_A - P_{AP2}) - (P_B - P_{BP2}) \quad (1)$$

where R is the profit caused by the new plan and P_i is the market value of *i*, i.e. the profit is the market value of the new plot 2 minus the loss of value on the original properties. The question now is how the price to buy A_{P2} will be determined – how the profit will be divided between the owners of A and B.

[7] The lowest price a seller is willing to sell his property for, or the highest price a buyer is willing to pay for a property.

In Sweden four basic profit division principles have been discussed in this context:[8]

- The profit should be split *equally*, as both A_{P2} and B_{P2} are necessary for the creation of the new lot.
- The profit should be divided according to the *area* that each owner contributes to the new lot, i.e., according to the relation to the area of A_{P2} and B_{P2}.
- The profit should be divided according to how much *value* the owner contributes. The more value he "invests" in the new plot, the greater his share of the profit should be. Profits should be divided according to the relation between $(P_A - P_{AP2})$ and $(P_B - P_{BP2})$.
- From a Swedish legal point of view a fourth principal is of interest. In 1956 the Supreme Court decided that the value of the new plot, i.e. not the profit, shall be divided according to the area that each owner supplies. If we assume that the value of plot 2 is 300.000 SEK, and property A contributes with one third of the plot, the price for A_{P2} will be 100.000 SEK. This principle is in Sweden labelled as the "average value principle".

This principle gets empirical support by Tenkanen's study (1984) of voluntary agreements in order to form new building plots. One conclusion of the study is that "if neither part of the complete site could be independently built (or otherwise effectively used), the unit price for a part of the site would be the same as that for the complete site".

4.1 The Cases

The building plot formation experiments comprise four cases, see Table 1. In the cases we have varied the area and the value contributed to the new plot by the buyer and seller. In case 1–3 the total profit is 100,000 SEK, whereas in case 4 the profit is 45,000 SEK (the case, which differs somewhat from the others which will be described more in detail below).

Table 1. *The building plot formation cases.*

Case	Area from the seller (sqm)	Area from the buyer (sqm)	Value from the seller (SEK)	Value from the buyer (SEK)	Value of the new plot (SEK)
1	1,000	1,000	25,000	100,000	225,000
2	1,750	250	60,000	15,000	175,000
3	500	1,500	50,000	50,000	200,000
4	250	750	5,000	250,000	300,000

[8] At least principles 2 and 3, profit-sharing according to *area* and *value*, have figured in the international debate. See e.g. Doebele (1982), Larsson (1993), Dieterich (1996) and Viitanen (2000).

The results in the four cases, profit-share to the seller, are presented in Table 2.

Table 2. *Profit-share to the seller – the building plot formation cases.*[9]

Case	Number of agreements	Profit-share to the seller	Standard deviation	Confidence Interval 99%
1	51	0.43	0.12	0.39–0.47
2	23	0.65	0.10	0.60–0.70
3	44	0.44	0.10	0.40–0.48
4	61	0.49	0.14	0.45–0.53

4.2 Results, Case 1–3

The prices from the concluded transactions in cases 1–3 – compared with the profit-sharing that would be the outcome if the four principles mentioned above are applied – are presented in figures 3–5 below.

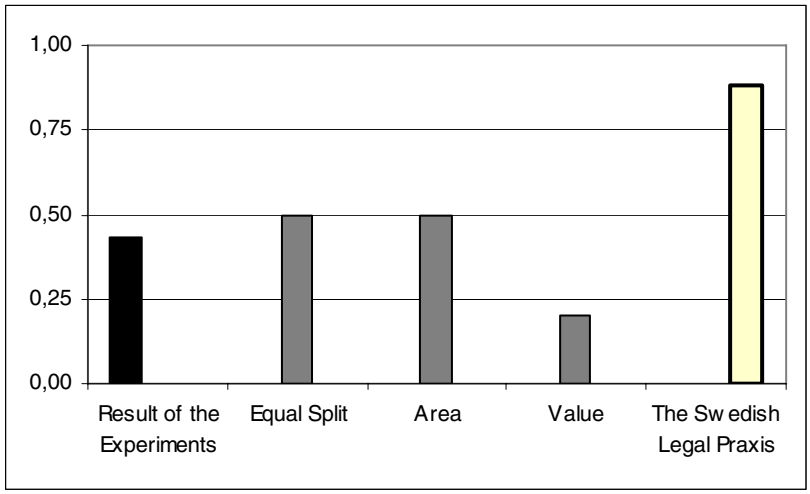

Figure 3. *Profit-share to the seller. Comparison between experimental result and other principles. Plot formation, case 1.*

[9] The frequencies of disagreements in Cases 1–4 respectively are 30%, 23%, 15% and 38%. The average frequency of the four cases is 29%.

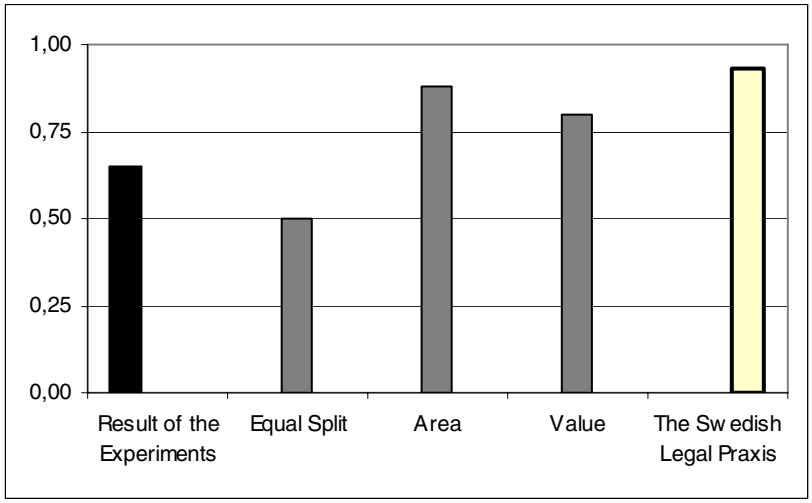

Figure 4. *Profit-share to the seller. Comparison between experimental result and other principles. Plot formation, case 2.*

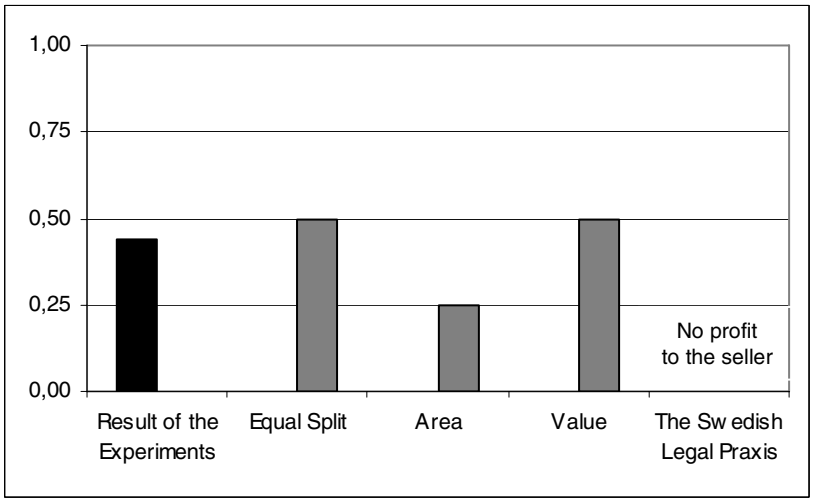

Figure 5. *Profit-share to the seller. Comparison between experimental result and other principles. Plot formation, case 3.*

As seen in the figures these results approximate to no single principle – but almost all observed prices come between the prices that would be observed given the best principle from the buyers´ perspective and the price by the best principle from sellers´ perspective.

In Table 3 we present data on the seller's average share in the three cases and the share that would be observed if prices were determined by the average of the best principle for the seller and the buyer. The Swedish legal praxis – "the average value principle" – is not analysed here, since few participants in the experiment mentioned and acted according to this principle.

Table 3. *Average profit-share to seller in plot formation case 1–3. A comparison between observed average in the experiments and the average of the sellers´ and the buyers´ best principle.*

Case	Observed average in the experiment	Average of sellers' and buyers' best principle
1	43%	35%
2	65%	69%
3	44%	38%

Although the predictions do not match the result perfectly – they seem to be better than competing theories and there is no systematic differences between prediction and observed shares. In two cases the actual share is higher and in one case it is lower. Our conclusion is therefore that this theory seems to be a good starting point for an understanding of actual shares.

4.3 Result, Case 4

Case 4 is a simplified version of a real case. Due to the elevation of land in parts of the Swedish coastline along the Baltic Sea, property owner B had become the owner of the land between the property A and the Sea. The owner of property A wanted to buy the land, but failed to reach an agreement about the compensation with property owner B.

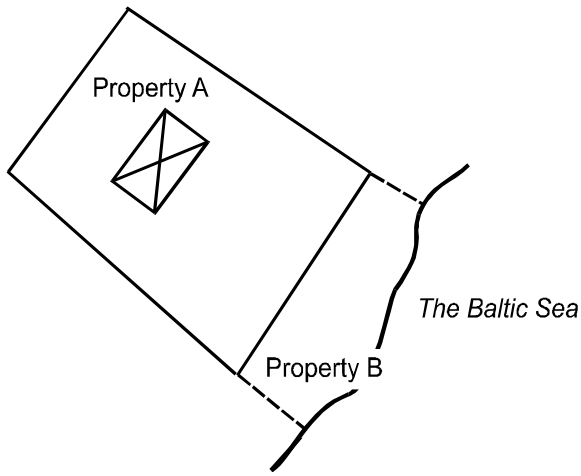

Figure 6. *Building plot formation, case 4.*

Property owner A then applied to the Cadastral Authority for a compulsory purchase order (according to the rules of reallotment in the Real Property Formation Act). The conditions for compulsory purchase were fulfilled, but the issue of compensation was finally decided by the Supreme Court 1989.

In this case the normal Swedish legal praxis – the average value principle – would require a compensation of 75,000 SEK (compare Table 1). But this compensation level exceeded the land's value for property A, which was 50,000 SEK, i.e. the prop-

erty owner A would make *a loss*. The Court then decided the compensation to be 50,000 SEK. Thus, this meant that the seller received the whole profit.

Our experiments indicate another sharing of profits in this type case. The average compensation comes to 27,000 SEK, which means that the buyer and seller split the profit equally, see figure 7.

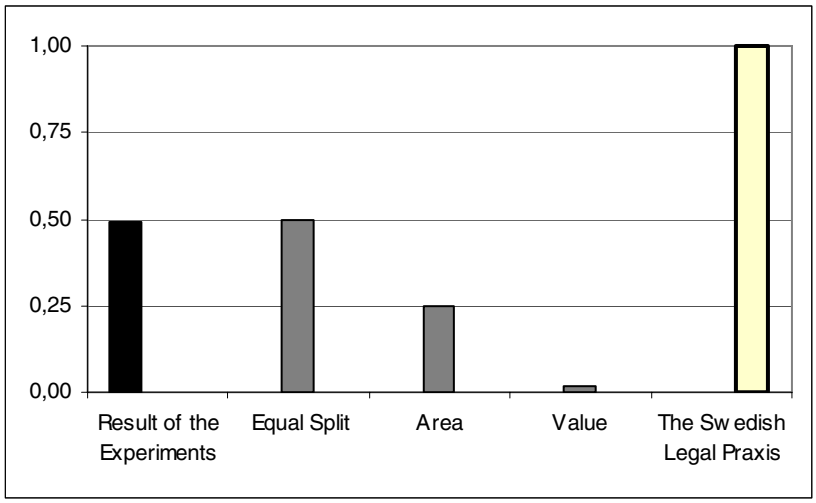

Figure 7. *Profit-share to the seller. Comparison between experimental result and other principles. Plot formation, case 4.*

Tenkanen (1984) has made an empirical study of similar cases in Finland. Dr. Tenkanen has been very kind to convey his data to us for additional analyses (40 voluntary agreements). In the study the seller's share of the profit lies between 0 and 50% in the vast majority of agreements. The average profit-share to the seller is 27%, i.e. lower than our experiments indicate.

However, on the basis on both our and Tenkanen's result it can be debated if the Swedish Supreme Court's decision complies with the *travaux préparatoires* of the Real Property Formation Act, that the compensation should correspond to the price that could have been expected if it had been a normal voluntary transaction.

5 Easements

In the experiments we used different easement situations, both formation of new easements and cancellation of old ones. The problem related to the formation of a new easement can be illustrated by the following case (see Figure 8). A new public water and sewer system is built in a certain neighbourhood. There are two ways for the owner of property B to connect to this system, via his own property or by an easement that allows him to cross property A, which due to land conditions is the cheapest way. The easement is a negligible inconvenience to property owner A, i.e. it has only a small effect on the value of property A. The profit made through the easement will then be the amount saved by lower construction costs minus the very small value decrease on property A.

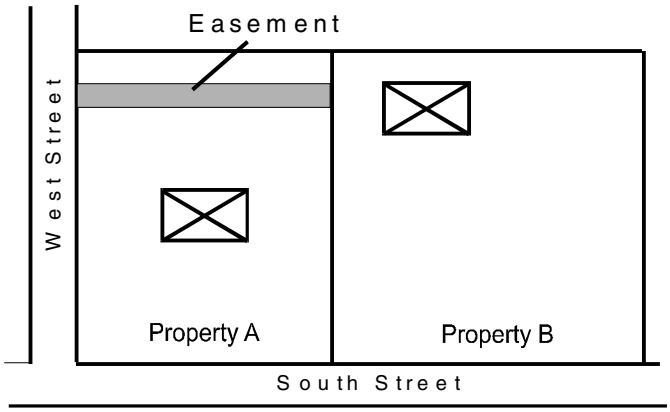

Figure 8. *The typical easement formation case.*

In this case there is no legal guidance from the Swedish Supreme Court. However, in the "common debate" two principles for dividing the profits have been discussed:

- *Principle 1*: The profit should be split equally, as both owners have to participate if the profit is to be made. (We assume that B has no third alternative.)
- *Principle 2*: The owner of A should only be compensated for the loss of market value that the easement causes, i.e. in the case described, all profit should go to B.

This case is interesting because of the asymmetry in the principles. No one seems to have put forward the principle that A shall have all the profits. If the buyer and seller meet half-way between the results according to principle 1 and principle 2, the buyer will get 75% of the profit and the seller 25% of the profit.

The easement experiments comprises five different cases – three related to the formation of a new easement, and two cases concern cancellation of existing easements. Altogether we have 105 agreements, and the result of the experiments is presented in Tables 4 and 5.

Table 4. *Formation of easements.*[10]

Case	Number of agreements	Profit-share to the seller	Standard deviation	Confidence Interval 99%
1	47	0.34	0.15	0.28–0.40
2	15	0.29	0.13	0.21–0.37
3	10	0.36	0.13	0.26–0.46
Total	**72**	**0.33**	**0.15**	**0.29–0.37**

[10] The frequencies of disagreements in Cases 1–3 respectively are 44%, 29% and 17%. The average frequency of the three cases is 38%.

Table 5. *Cancellation of easements.*[11]

Case	Number of agreements	Profit-share to the seller	Standard deviation	Confidence Interval 99%
1	13	0.22	0.16	0.11–0.33
2	20	0.25	0.11	0.19–0.31
Total	**33**	**0.24**	**0.13**	**0.18–0.30**

As seen in Tables 4 and 5 the average profit-share to the seller is 0.33% and 0.24% when easements are, respectively, formed and cancelled. And in all fives cases there is significant evidence (at the 99% level) that the profit is *not* equally split between the buyer and seller. Furthermore, the results fit relatively well with the theory predicting that buyer and seller meet half-way between their best principles, i.e. a profit-share of 25% to the seller.

6 Different buyers – different profit-sharing?

The above bargaining experiments have focused on profit-sharing in different cases, where the buyer and seller only have been described as "property owners". However, another issue is whether features of the buyers and sellers themselves should have any relevance on profit-sharing (e.g. Epstein, 1985). In Sweden, and other countries, the debate has been initiated by the privatisation of utilities that earlier were operated by public bodies, e.g. electrical power, district heating and telecommunications (Kalbro, 2004). Shall profit-making private enterprises have he same right to acquire properties compulsory – at the same price – as state or municipal bodies?

In order to see if characteristics of the buyer play any role in the negotiation process and the agreed price level we have – so far – conducted two experiments. For these experiments we used a similar case like the one described in Figure 8, i.e. the negotiations concerned the formation of an easement. For the development of a site a new road had to be constructed, and by using another property, the developer/buyer, could save construction costs.

For one group of participants/bargainers the buyer was described as a municipality, developing a cottage for recreational purposes, where individuals and civic organisations would be able to rent the cottage on a cost-recovery basis. Thus, the formation of the easement gained a "public use". For another group the buyer was presented as a multi-national hotel chain, with the purpose to develop a conference resort for "commercial use". Besides from these differences between the buyers, all other factors in the cases were exactly the same (property values, cost saving by the easement, total profit etc).

[11] The frequencies of disagreements in Cases 1–2 respectively are 0% and 9%.

Table 6..[12]

Case	Number of agreements	Profit-share to the seller	Standard deviation	Confidence Interval 99%
Public use	11	0.38	0.18	0.29–0.47
Commercial use	14	0.47	0.20	0.38–0.56

As seen in the table the "commercial" buyer had to pay more for the easement, compared to the municipality with a "public purpose". However, with a low number of agreements in each case, there is no statistical significant difference between the cases (at the 90% level). But this result, we believe, clearly motivates the continuation of similar bargaining experiments in order to see if buyer characteristics influence the sharing of profits.

7 Concluding Comments

The results of the experiments raise two questions: Why are the profits divided in a way that is significantly different from an equal split? And why are there significant differences between the profit-sharing in the different cases?

A closer analysis of the buyers´ and sellers´ bids/demands shows that the parties tend to meet half-way between the initial bids and demands (Kalbro and Lind, 1999). Thus, the experiments indicate that principles that both parties judge as relevant as a starting point will affect the price and the profit-sharing. The differences between the cases suggest that this will depend on the specific context. The price might e.g. be higher if the buyer is a commercial enterprise instead of a municipality or a neighbour (as discussed earlier).

On the basis of these findings, it seems that a final agreement is a result of a two-stage process:

- The parties establish their initial positions.
- Given these positions the parties meet half-way.

The tendency to meet half-way can also be seen in the bargaining games presented in Yavas et al (1999). Our hypothesis concerning the initial demands is that the parties feel that they have to fall back on some more general principle (see Young 1991). As they want to have a large share they look for a principle that furthers their own interest, given the restriction that the principle can be accepted as a starting point by the other party.

Standard game theoretic models include an argument about symmetry. If there are no relevant differences between parties they should get the same share. What our experiments suggest is that the legitimacy of certain ethical principles in a society can create an asymmetry and that the consequence can be that one party gets a higher share than the other.

[12] The frequencies of disagreements in the "public use case" is 59% and in the "commercial use case" 33%.

From that perspective our experiments indicate an interesting combination of ethical principles and self-interest. The participants tended to argue in terms of principles of fairness, but they chose the principles that furthered their own interests.

Of course, the details of the design of an economic experiment can always be questioned. In experiments there is always a question about how the choice of participants might affect the result. In this case the participants were young, rather successful in school and probably from a rather well-to-do economic background. This differs in some ways from the ordinary property owner, especially the age, but the average property owner also has a level of education and an economic situation above the average. Anyway, we think the material presented here show that experiments can be a useful complement to theoretical arguments (from academics, legislators, courts etc). When we lack data from the market, both theoretical arguments and experimental results can be used as evidence, even though it is far from conclusive. To take one practical example: Our experiments suggest that there might be a gap between the legislators general principle presented in the introduction – compensation to the seller shall correspond to prices in normal voluntary agreements – and the present legal praxis decided by the Swedish Supreme Court!

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