

OXFORD



CONSTRUCTING QUALITY

The Classification of Goods in Markets

EDITED BY Jens Beckert & Christine Musselin

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Quality and Temporality in Timber Markets

*Patrik Aspers*¹

Introduction

This chapter analyzes the relationships between quality, value, and price in markets for standing timber. How can buyers and sellers of timber strike a deal when no one knows the quality of what is being traded: the trees standing in the forest? This text focuses on quality and argues that neither price nor quality per se is the problem: it is the indeterminacy of what is traded that causes problems in this market. The problem revolves around the temporality of the deal. When a contract for timber harvesting is signed, the buyers and sellers know the price of the different qualities of timber, but only after the deal has been concluded do they know the quality of the logs.

What buyers and sellers are talking about is not timber logs, but in most cases standing trees, for example a combination of birch, spruce, and pine trees standing on an encircled area in a forest. Existing price lists provide information about prices for the standardized timber qualities of the various species of tree. These price lists are combined with different forms of trading that allow buyers and sellers to shift the burden of uncertainty between the parties. When the deal for trees standing in the forest is signed between a seller and a buyer, it is unclear to both seller and buyer exactly which timber will be used for sawing, pulp, or energy.

Several decisions will be made and much information gained between the time the contract is signed and the final interaction between the trading

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parties. One important decision is made by the operator of the harvesting machine in the forest. The harvester will cut the trees into logs, some of which will be sawtimber, others of which will be pulp. The forwarder will take the trees to the road, where they will be put into piles according to their intended use. A truck will pick up the sorted logs on the roadside and take them to the plant, where they will be processed. Before entering a processing plant, a pulp manufacturing unit, or a sawmill, the logs will be graded individually.

Both sellers and buyers face uncertainty: will the trees be logs of a lower quality than average, due for example to more knots or to rotten timber? Though some sellers have good knowledge of their trees, they may feel that they are not being paid enough for quality timber. Some buyers are willing to pay extra for high-quality sawtimber, but if most of the trees will be used for pulp, it is probably better to search for a buyer that pays well for that kind of timber. The volume cannot be estimated when the timber is still standing in the forest. However, volume is often less of a problem than quality, since volume is only a constant that is multiplied by the price given to each quality of timber.

The characteristics of the goods—what is growing on a piece of forest land—make it hard to strike a deal where both sellers and buyers can know in advance what they will get and how much they will pay. This is the case in many markets in which resources are extracted from nature. Actors in these markets hence face a problem because of the uncertainty (Beckert 1996; Knight 1921) of what is traded, which somehow has to be resolved.

This chapter shows the role of temporality in trading and how uncertainty is addressed with the help of ties bridging the market. It makes three contributions to the economic sociology literature. The first contribution is to analyze the interrelations between quality, value, and price in markets with standardized goods. That the deal is signed before the parties have knowledge of what is really being traded highlights the often neglected role of temporality in market interaction. How do actors cope with the uncertainty that is created? A second interrelated contribution is to add new insights into the problem of information and knowledge (Akerlof 1970) in standard markets (Aspers 2009). The third contribution consists of information about a hitherto unanalyzed market. Since the timber market is so little known, it is futile to address the first two questions prior to a detailed description of the market.

The empirical material for this study consists of participant observation and interviews, as well as written documents, web sites, and Internet discussion forums. Six interviews have been conducted with sellers, buyers, and representatives of organizations active in the markets for timber. Several days have been spent in the field, in forests with actors, and at measuring stations. A large number of scientific journals, written mostly for forest owners and those working in the industry, are included in the reference material.

Theoretical Approach

The chapter operates with three concepts: *quality*, *price*, and *value*, and these are analyzed in relation to *markets*. A market is "a social structure for the exchange of rights in which offers are evaluated and priced, and compete with one another, which is shorthand for the fact that actors—individuals and firms—compete with one another via offers" (Aspers 2011: 4). *Price* is the sum expressed in a means of exchange—in this case kronor, the currency of Sweden—for which the offers are traded (cf. Beckert 2011). *Value* is the manifestation of what actors see in the offers, as sellers or buyers. Value is thus not only economic: an object of trade may also be of aesthetic or moral value (Aspers and Beckert 2011a).

If the quality of the goods traded is established—a case which, as many authors in this book show, we cannot always take for granted—price-setting is seldom a problem. Price is, as it were, the economic value of the object being traded. The condition is that the quality of the good or service is based on a standard, and known prior to the transaction in the market; these markets are called standard markets (Aspers 2009). The quality scale in standard markets is independent of the actors trading.

In other markets the product is partly, or even largely, defined in the market. This is the case for fashion garments, but also for some services such as consulting. In these status markets, products are the result of interacting buyers and sellers, who endow the products with value in the market. The social structure of the roles made up of buyers and sellers with identities in the timber market have become institutionalized. Products can either be defined without market interaction (using a standard) or defined in the market (as a result of the status of the interacting parties). One may argue that the scientific notion of "quality" in status markets often has little or no meaning, since products in these markets are ranked by who is buying and selling what, rather than according to objective qualities.

It should be noted that quality as defined here is less encompassing than the use of the concept in the introduction of this volume. The notion of quality presented in this chapter draws on how it has been used by philosophers. Quality refers to two things. First, quality implies difference (Pepper 1957) on a nominal scale. This is to say that there are different categories, each having a distinct quality. In the timber case and many others, quality is constitutive of the product and thus the category of trade. Quality in the second sense ranks objects of a certain quality on at least an ordinal scale. This means that an object "has" more quality or less quality by virtue of which category (quality, in the first sense) it is. To determine quality in the second sense requires the existence of standards (cf. Brunsson et al. 2000). The standard has to be used by actors, so

that "consumers [and producers] agree on quality variations" (Banks 1963: 1368). This suggests that, "[a] good quality standard for any product should be built on characteristics that users of the product recognize and consider important" (Noles and Roush 1962: 21). Such a standard can be rooted in technical devices or an institution.² But what is standardized must not be material.

Few objects traded in markets are completely defined in terms of quality or completely lack references to quality. Following this line of reasoning, the quality of a car refers to the material it is made of and the reliability of the vehicle, not to how many heads turn when it cruises through the city center.³ From a theoretical point of view, many markets are about objects or services that essentially lack references to quality, such as fashion (Aspers 2010) and other status markets.⁴

To clarify the notion of quality, it is useful to be as precise as possible and to distinguish this notion from related concepts, most notably value. Quality is directed to the object (or service), and value to the justification of its worth (Aspers and Beckert 2011b: 5–6). An example will illuminate the difference: a forest may consist of trees of high timber quality and at the same time have high quality in terms of birdlife (here we do not need to consider how these two qualities are measured; it is enough that the measures are known and accepted). These qualities may be valued differently by actors. That two persons agree about the quality of the bird population does not mean that they value this population in the same way. A value refers to an institutionalized discourse of justification, that is, something that is established in society (cf. Boltanski and Thevenot 2006). If the valuation were done in terms of money, one could put different price tags on the valuations done by these two persons. These concepts—value, quality, and price—are central to the analysis of the uncertainty facing traders in the market for timber.

The Field

The academic literature on timber trading is almost nonexistent. Some historical studies on the Swedish forest sector exist. Heckscher's work (1941) is still

² Even though there is a standard, there is often a "technical-practical" side to determine how to measure quality. We can, to take one example, measure the hardness of steel according to the Brinell scale. This standard, developed by the Swedish engineer J. A. Brinell, is built on a mathematical formula, and rooted in other more institutionalized standards, such as length and weight.

³ How many heads turn may be due to quality, but from a logical point of view, the number of heads turned cannot be the foundation of a standard. Status does not refer to a standard (if so, it would be[come] a standard). The number of heads turned can be the sign of a standard or of the status of the car, but not a standard itself.

⁴ This is not to deny that the fabrics of the garments may be of different quality, for example; the point is that the object traded is not defined in terms of this quality standard.

the most elaborate, not least since he connects what happens in the forest sector to other sectors and to social life more generally. There is a small literature in economics on timber auctions (e.g., Athey and Levin 2001; Haile 2001) that is mostly occupied with modeling and how actors ought to behave. But since large and reoccurring auctions are not taking place in Sweden, this research is only of interest as a point of reference for this study. Some analyses of prices exist, but they do not analyze the operation of markets. Economic sociologists have sparsely studied natural resource markets. There have been some studies on technical devices, using Actor Network Theory, but these have looked empirically at mostly financial markets (Callon, Millo, and Muniesa 2007). Kollock (1994) has reported on rubber and rice markets and noted that when the quality uncertainty about the products traded is high, as in the case of rubber, actors create long-lasting ties that create a bridge across the market. In the rubber market, the price is set without knowledge of the quality, whereas in the timber market the price of each quality is known. What is not known in the timber market is the quality of the trees standing in the forest. It is rare to find neglect of important areas such as this one in the contemporary academic literature.

The literature provides information on the historical conditions that explain some of the observations we can make today. Heckscher (1941) has stressed that the state, at least in the time of Swedish king Gustav Vasa in the sixteenth century, heavily regulated the use of timber in the forests. The king also expropriated land from the church and redrew the ownership map in Sweden. In the 1850s, when the Swedish "timber market" was formed, the buyers were strong because of their superior knowledge of, and frequent contacts with, the demand side, which was often made up of foreign buyers. Knowledge of the economic worth of timber, which of course oscillated with the demand, travelled exclusively from buyers to sellers. Buyers, then, had the upper hand in the conflict of interests inherent in this trade: sellers wanted as much as possible for what was traded—the trees—for which buyers wanted to pay as little as possible. This was especially the situation when the Swedish forest industry was industrialized (around 1850). Companies, especially in the north of Sweden, purchased land from farmers in ways that were not always considered ethical. The competition was tough, but cartels were created.

In Sweden today, 50% of the productive forest land (12,500,000 hectares) is owned by individual owners, 26% by privately owned companies, 17% by the state and state-owned companies, and 7% by others (e.g., the Protestant Church). About 330,000 people own land in Sweden (about 3.7% of the total population). The average size of land possessed by individual owners is 34 hectares, which in terms of production is very small. The total net value of Swedish timber exports, according to Statistics Sweden (2010), is about €10 billion, making it the country's largest net exporting industry and hence a considerable factor in explaining the wealth of the nation. The more refined

products of pulp and paper are of higher added value than sawn timber and today represent by far the largest share of exported value. There are relatively few buyers, but those who exist are large and the largest volumes must be purchased from small-scale forest owners, the majority of whom trade less than once a year.⁵ The uneven distribution of power and knowledge is due to the degree of professionalization and organization: the buyers are working full-time, whereas many sellers have limited knowledge.

Under the economic pressure of strong buyers, farmers came together in associations, as did consumers. This happened relatively late among Swedish forest owners, just before World War II. In the 1960s, the cooperatively owned associations of forest owners were under pressure from political forces that wanted to socialize ownership of the Swedish forests. The historical literature also shows how these associations began to create their own demand for timber by setting up sawmills and pulp factories (Johansson and Thullberg 1979). The idea to create forest associations came from Norway (Larsson 1984), a country with a more advanced forest industry than Sweden's. The organized forces of buyers and sellers have each respectively pushed the state to legislate in favor of their interests. Most of the research on cooperative associations, however, is on the agricultural sector, and relatively little is known about the forest sector.

Standing timber can eventually be used in many different ways, but it is mostly traded as one offer when standing in the forest. Once harvested, the timber may be used for pulpwood or sawtimber, but it is also used for furniture, diapers, napkins, isolation, heating, printer paper, and much more. Even some of the clothes we wear are made at least partly from wood, in the form of wood fiber-based textiles. The different markets in which the products are used are embedded within one another in a production chain (White 2002). The price of the timber depends on the prices in these markets in the same production chain. But it also depends on the cost of harvesting the trees, which is possible to estimate but not to know. If state and institutional frameworks are the more distant environment of the market for standing timber, then the timber industry as a whole, with its markets, is the immediate environment.

⁵ There is not sufficient space here to detail all the links of the production chain that processed timber goes through. The bark and other leftovers from sawmills are sold to pulp and board factories, which use these as raw materials in production. This production method is also a substantial element in understanding how the business-to-business market is formed. A pulp factory has no intrinsic interest in sawtimber; such timber is simply too expensive to be used in the boilers of their factories. They may nonetheless be willing to purchase high-quality trees from forest farmers: the pulp-factory buyers simply trade this lot for pulp-quality timber and/or fresh fiber from the sawmills (from cuttings and smaller parts that cannot be sawn). This also means that the risk is low, at least for pulp-timber buyers. Strictly speaking, they want fixed volume each day, and given that there are known prices on sawtimber, they can always resell sawtimber.

Timber has been an economically important resource for a long time, first for the production of iron and later for steel. Timber has also been a source of exports in itself, and even more recently has been exported in refined forms such as pulp and paper. Even in the pre-industrial era, timber was already of great importance in producing shelter and of course energy, in the form of heating and fuel for homes and industry; it remains an important energy resource today. Most renewable natural resources have a temporal character, but trees stand out because of their long production cycle.

An example

To make my case more tangible, and at the same time to describe the field, I will start with a concrete example: a seller who wants to harvest a so-called tract. A tract is the smallest unit that can be considered for an activity (e.g., harvesting). In this case the area of the tract is four hectares (each hectare is 10,000 square meters) of largely pine (Scots pine, 80%), spruce (Norway spruce, 15%), and other trees (often birch, 5%).⁶ Each tract consists of trees of similar age. The trees in our fictive case are 90 years of age. The owner must submit an application that states that the trees will be harvested, and if nothing speaks against it (e.g., that there is a population of a rare species of plant or animal nearby) the state-run Swedish Forest Agency will approve the application.

The owner's knowledge about the trees is often represented in condensed form in the forest plan that describes her land in detail. This plan describes the various tracts that make up the land, the composition of the trees, their age, diameter, and much more. It indicates what has to be done to the trees, such as thinning, and when it ought to be done, but the plan does not normally say much about the quality of the trees. It is possible to make at least a rough estimate of the quality of the trees based on knowledge of the productivity of the land, the soil, and its locality (e.g., the geographic location as well as whether it is on the north or the south side of a river valley), but a visual examination is still necessary to make a more accurate estimation.

The production cycle of wood is circular and can be divided into phases.⁷ This cycle varies from 60 years, in the south of Sweden, to 120 years in the

⁶ Four hectares is close to the average size of a final felling tract in Sweden, but a tract may be anywhere from half a hectare to 30 hectares, and occasionally even larger.

⁷ The process is of course circular, and if we begin with the final harvest, the next steps are soil scarification (i.e., preparing the ground for planting), planting or sowing (ca. year 1) or natural sawing from existing trees, control of regrowth (ca. year 3), pre-commercial thinning (ca. year 15), commercial thinning (1–3 times from year 40), and finally, harvesting. Additional activities, such as pruning, fertilization, and ditching may apply. This process of course follows a biological process, but the biological process does not have a clear beginning and end for a tract. It is this process of production and economy that characterizes forest cultivation.

northern part of the country. Unlike livestock or vegetables, trees continue to grow and increase in value with little to no cultivation: the forest owner, if financially solvent, has some flexibility to delay the final harvest until a time when the price level is high. The income from selling a cubic meter of pulpwood is about €30; for sawtimber it can be €50–€100. There are also harvesting costs, which for final felling may be about €10 for each cubic meter. The commercial thinning is the first stage at which the cycle turns into a positive cash flow for the owner. Given the long production cycle, incomes from forestry are irregular, especially for smaller owners.

Trading Timber in Markets

In the timber market there is a culture of how to do business that includes what is implicit in contracts. Timber trading is more organized today than it was during the rush of the nineteenth century, but many forms of trading have their origins in those days. There are plenty of small sellers, some mid-sized sellers, and a few very large sellers in the public market. The number of buyers in each region is limited, sometimes only a handful. Prices are set publicly by means of posting price lists for different qualities on the web sites of the buying firms. As can be seen in Table 3.1a, the price set depends on the level of timber quality (Grades 1–4), diameter, and length (Table 3.1b). Tables 3.1a and 3.1b show the price list and grades of pine trees for sawtimber. Table 3.2 explains the different quality grades of pine trees. About 60% of the timber harvested will be traded as sawtimber, and 40% will be traded as timber for pulp, which has a lower price.

Timber is classified and measured at measuring stations of the independent Timber Measurement Council (VMF). This organization is owned jointly by sellers and buyers and its mission is to operate as a middleman. The actual measurement, however, is not merely an institution created out of interaction between the parties—buyers and sellers in the first layer market—the state has played a key role here as well. There is a law (the Law on Wood Measurement [virkesmätninglagen] 1966: 209) that sets the basic terms for how wood is measured.⁸

These price lists are of course an important source of information that buyers offer timber sellers. Though it is also quite possible that a buyer will add a premium to the official price list, these lists give an idea of the current pricing.

⁸ That the market is regulated is actually no surprise, since there is a long tradition of state regulation of natural resources. More research must be conducted to map out the details, the conflicting interests, and the various attempts that have been made by buyers and sellers to organize this market.

Table 3.1a Price paid (Swedish Krona) per cubic meter under bark^a

	Top diameter (cm)												
	12	13	14	15	16	17	18	20	22	24	26	28	30
Grade 1	457	462	541	583	641	671	701	773	829	879	915	938	947
Grade 2	397	399	475	459	526	545	565	612					
Grade 3	397	399	475	489	512	531	549	594	623	641	658	669	675
Grade 4	380	382	459	464	470	474	478	489	499	511	521	524	525

^a This price list is from October 2011 and was taken from SCA, the largest private land owner in Europe.

Table 3.1b Correction of sum paid (Swedish Krona) per cubic meter under bark for different diameters, in relation to the "standard length" of 460 cm

	Length (cm)							
	340	370	400	430	460	490	520	550
14–16.9 cm	–75	–55	–35	–15	0	+10	+25	+30
17–19.9 cm	–65	–45	–25	–10	0	+10	+25	+30
20+ cm	–60	–40	–25	–10	0	+10	+20	+25

Tables 3.1a and 3.1b: Example of a price list showing the four quality levels of pine tree sawtimber (Grade 1 is the top quality level). These lists differ between buyers, reflecting their different needs, but diameter, quality, and length are the variables in all existing price lists. The quality levels are a nationwide standard and are measured and classified by the independent Timber Measurement Council (VMF).

We may say that the economic value is represented foremost by the price level, but also by the different price corrections reflecting the traits of the logs.

What do these grades mean? There are some conditions that a sawlog must meet to qualify as such according to the Swedish Timber Measurement Council. First of all, the sawlog must be cut from a live stem section and crosscut with a saw, which means that it is often a matter of weeks from harvesting until grading to ensure that the sawlog is not downgraded in terms of quality. The sawlog should also be free of insect damage and storage decay, and finally must contain no coal, soot, stones, metal, or plastic.

Grading timber takes experience, but there are objective scales and formal institutions that provide the foundation for this interpretive work. Table 3.2 illustrates the baseline of grading, according to the Swedish Timber Measurement Council.

To see how the market deals with the indeterminacy of the objects standing in the forest, I will look at the interests of the two sides in the market and how each side responds to this indeterminacy. The findings provide the foundation for a discussion and analysis of the forms of trading used in the current timber markets in Sweden, each of which represents a different solution to the "price-quality-value uncertainty."

Quality and Temporality in Timber Markets

Table 3.2 Pine grades^a

Grade	1	2	3	4
Log type	Butt log	Not butt log	All log types	All log types
Knots, whole mantle surface	max. 2 cm, all knot types max. 5 knots	sound knots max. 12 cm other knots max. 6 cm	sound knots max. 12 cm other knots max. 6 cm	spike knot max. 12 cm other knots unlimited
Knot within 15 cm of butt end		a minimum of two distinct whorls or one sound knot		
Knot swelling	max. 5 cm		min. 12 cm	
Growth rings 2–8 cm from pit	min. 20 cm			
Straightness	max. 20 cm loss of saw yield			max. 120 cm loss of saw yield allowed
Indication of top rupture	not allowed			
Blue stain	not allowed			allowed
Forest rot	not allowed			max. 5% of end surface

^a These dimensions, many of which are unclear to outsiders, are interpreted by the person grading the logs.

Market actors and their relations

There is not one homogeneous Swedish timber market, but several different interconnected segments. A spatial dimension to these markets, or market segments, can be observed. There are geographical markets, implying that sawmills and pulp factories in the southern part of the country get most of their timber from the south. Some timber is also imported, but the timber from the northern part of Sweden, where it is used for domestic mills and factories, is rarely transported. In addition to different trading cultures, the same buyer may in fact have different price lists in different areas of Sweden, a further sign of the existence of different markets.

The market we observe today is not the result of a rational decision, nor is it a state that has emerged spontaneously. Rather it is the result of struggle and attempts to organize the market. The buyers have been the strongest actors in the Swedish market. They are fewer in number than the sellers, but the average buyer is much larger than the average seller. At the time of the industrialization of the northern part of Sweden around 1900, the large sawmills and pulp manufacturers had grown big and powerful thanks to their increased exports to the European Continent (Heckscher 1941). Their structural "brokerage" position (Burt 1992), between the Swedish market (with its low costs for input materials) and European consumer markets, could be used to keep a large part of the profit. Many of these large companies purchased land as well as timber from farmers, and sometimes this was done with the help of the

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state. This furthered sentiments of distrust among the farmers. Today, some of the large buyers of timber own land, which is used to cater to their own industries, though they also have to purchase timber on the market. Consequently, many of the firms producing diapers, napkins, pulp, and sawtimber have vertically integrated their entire production chain, which often includes the production and cultivation of seeds and plants.

The farming industry, including the Swedish timber market(s), is characterized by a monopsonistic competitive market structure. This is the reverse of the traditional production market (White 1981, 2002), as it were, with a different flow. White (1981) has written that a typical producer market has about a dozen producers (sellers), each with a specific market identity that is known by the producer's competitors as well as its customers. In this market we find few buyers but many sellers.

There are different kinds of timber buyers, each with different needs: some want timber only for pulp, others only for sawing, and still others need timber as fuel; many buyers need timber for more than one kind of use. One of the buying organizations is the forest owner association for each area that have such a buying organization. The forest owner associations purchase timber largely from their own members, but also from others.

Over time, the forest owner associations have become more than merely bargaining organizations that work to increase prices in the market struggle with strong buyers. Some of these associations have also been involved in vertical integration, meaning that they have invested in sawmills, pulp manufacturing units, and other industries that need wood as input material. In this way they have on the one hand ensured that there is a constant need for the organization members' timber, and on the other that there is a sufficient supply of timber. The associations' own industry capacity, however, is small in relation to the large companies that need wood for their industries. The association nonetheless makes sure that the prices for timber in the market are high and that the buying side cannot use its power to build perfect cartels.

There is also a second-layer market, which is largely about redirecting the flow of timber so that the different industries and plants get the right input material in the right amounts. A central aspect of this industry is that while small sellers have fixed roles, and buyers, too, have fixed roles in the first-layer market, these "buyers" may act as either buyers or sellers in the second-layer market of interfirm trading of timber.

A single contract between buyer and seller may concern more than final harvesting. In many cases the buyer also takes care of the process of planting new trees, which may be done six years after the contract is signed. Other owners do most of the cultivation, including harvesting, themselves. Deals are based on trust and the implicit idea that not only are personal relationships

important but buyer organizations also have a history in the market and a reputation. Seen from the seller's perspective, the buyer is an expert and a person who can help out with all kinds of issues that may confront forest owners—even if only to redirect a seller to the "right" person, with the necessary competence. The repetition of such deals also generates trust. Through the "give and take" that characterizes these relations, actors are able to cope with uncertainty; a buyer may purchase timber from a seller at a good price after a storm, even though this may not be a good deal in the short term. These ties are often more fundamental to the seller, whose knowledge of the market, the industry, and the practice of forestry is lower than the buyer's. A seller expressed the typical situation she and other sellers face in the following way: "What is the difference when selling to [a] factory, where pulpwood is the main category, versus selling to a sawmill that focuses on smaller sawtimber? ... You are always screwed. It is about being as little screwed as possible." A seller who sticks to one buyer may feel that she is treated well. One buyer stated it was even the case that one "inherits" the relationships with a seller when the younger generation of the family takes over the land. Long-lasting ties, which are common in many industries (e.g., Aspers 2010; Uzzi 1997), are due in the timber industry to the combined effects of temporality, which means that a deal is often stretched out over several years, from the contract to the actual harvesting and recultivation of the land. Furthermore, instead of having to search for the "optimal" choice—a choice which nonetheless can only be evaluated years after the decision of trading partner has been made—a strong tie to one buyer is for many the preferred way to control the uncertainty that the market environment represents. Buyers have informational material and offer fringe benefits, such as electronic forest plans and free entrance to trade fairs, as ways to create and above all maintain ties. In some areas, hunting parties—which are of the utmost importance for the identity of its inhabitants—are the domain to maintain networks for both sellers and buyers. Information travels within networks of forest owners (in some areas one should rather speak of a "net-dom" (White 2008)), as well as within the domain of forest owners—through magazines and meetings arranged by the Swedish Forest Agency and the different forest owner associations.

In the actual trading situation, various forms of price additions to the official price list are also common as another means tie up sellers. Buyers may also be proactive and contact sellers whose trees are mature for final harvesting to "inform" them of this option. Buyers will know the condition of sellers' trees from satellite pictures or from having observed them in the forest. It is a market in which buyers have a constant need for volume, and hence it is of great importance for buyers to maintain good relations with sellers.

Forms of trading

If trust is one way of dealing with the uncertainty sellers face, deciding what form of trading to use is another option they have. Sellers in the timber market combine different methods of trading with the use of relations. Sellers may have trading partners whom they trust to do thinning and whom they can solicit advice on forestry in general, but they may welcome more open competition between buyers when it comes to final felling. There are several forms of timber trading. In some cases the sum to be paid to the seller is determined prior to harvesting, in some cases after. Each trading method distributes the risk between buyers and sellers differently. The existence of several forms of trading is interesting. I will try to outline reasons why this is the case. An explanation of the various forms of trading must take historical factors into account, and it is clear that these may have coalesced over time to create the institutionalized methods that are in use today.

The different ways of trading timber are listed below. While the frequency and volume of each form of trading is not available, it is nonetheless clear that the methods differ depending on the area in Sweden and the economic conditions, that is, whether it is a "sellers' market" or "buyers' market" also matters. This chapter does not offer sufficient space to analyze the reasons that forms of trading differ or to analyze their historical development, but each trading method can be at least partly understood in light of the needs of the industry which are fairly stable and predictable. Hence, buyers must be open to a variety of preferences of different sellers. The industry has enormous investment costs, particularly for pulp manufacturing units, and for large sawmills as well. It is common in the timber industry for a large investment to be announced years ahead of its use, which means that both competitors and suppliers can act on this knowledge when planning their activities. For example, all actors are able to predict whether there will be a timber shortage since the amount of trees that will be available for harvesting in the year to come in the vicinity of the production unit, and in Sweden at large, is known to everyone: Statistics Sweden and the Swedish Forest Agency provide this information free of charge.⁹

⁹ It should be emphasized that since the trees can be resold several times before they are actually measured (if measurement applies), the seller may notice on the receipt (which is very detailed) that the timber was measured for an industry that the buyer does not belong to. This may inform the seller that the timber has been traded at least once, and perhaps as many as six times before reaching its final sales destination outside the industry or industries where it has been sold. This business-to-business timber market (or timber exchange, since there are also many long-bilateral contracts) is built on long-term contracts between firms. Seen from a distance, this market is about optimizing the flow of the industry. Trading forms are developed to cater to various needs and are affected by the demand and trading in the second market layer.

Forms of Timber Trading

1. *Each tree is "marked," that is, classified individually.* The information on all the trees in the tract is compiled in list form. This means that buyers may calculate what they can offer for the trees put on sale. The marking is done by an independent firm on behalf of the seller. The trees are left standing in the forest, each with a colored mark, and deals are made in reference to these marked trees. Each tree is included in a list, so that the amount, type, size, and length of tree can be clearly seen. In this form of trading the buyer covers all costs of harvesting, transport, and so on, and signs a contract with declarations about harvesting conditions (environmental concerns, etc.). Sellers using this trading method want several different buyers to compete, so that a high price will result and the seller may then choose from the different offers received. In this case there is no additional measurement, classification, or grading of the trees required. If the buying firm uses all trees, they may sort these for their own purposes, but in such a case the buyer may do what s/he prefers with the trees. This trading method is not as common. It is nonetheless used in booming economies, which may be because sellers can then obtain relatively easy access to many potential buyers and thus profit from the high demand. This method also seems to be used more in the southern part of Sweden, where many sawmills are located—mills which do not have a forest of their own and therefore must operate on the "spot market" for timber.

2. *The seller harvests the trees.* This is typically done by farmers with many years of experience working in the forest. The farmer must then harvest the timber personally, in such a way that the "optimal" usage of the trees (in terms of the needs of the buyer) can be attained. It is rare that sellers first harvest the trees and only then contact buyers. Few farmers sell larger posts this way, unless they work full-time as farmers. In this trading method, the buyer picks up the trees at the roadside to sort them into sawtimber and timber for pulp production; the trees are measured and graded by the Swedish Timber Measurement Council when they reach the final destination. Note that in this form of trading the measurement is done outside of the production unit to which the timber is transported. The seller is paid according to the price list of the buyer. In reality, the seller contacts a buyer, who then informs the seller which lengths the saw mill requires.

3. *The buyer does the harvesting,* at a cost that is set prior to the harvesting, and the seller is paid as in Point 2, that is, according to the price list.

4. *The buyer does the harvesting,* with the difference that the real cost of harvesting—a cost that is known only after the harvesting team has left the forest—is withdrawn from the sum that the seller gets. In this case the seller has relatively little knowledge about the outcome, and must trust that the

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buyer will only withdraw the real cost. If, for example, the terrain is difficult, however, this may be what the seller is "offered."

5. *A fixed price is set for the (unknown) cubic meters of standing timber.* The amount is measured after the wood has been harvested. In this case the grading, and hence the quality, does not matter to the seller; only the volume matters.

6. *The trees are cut, measured, and graded electronically by the harvester,* and paid according to an agreed price list. The harvester cuts the timber in such a way as to maximize the value of each tree. Though this may seem optimal, it is nonetheless unclear to the seller which price list will render the best result for the tract offered for sale. But it at least facilitates the comparison of alternatives.

The measurement and classification of the timber, with the exception of forms 1 and 6, involves the Swedish Timber Measurement Council, which determines the quality and amount of wood that a seller delivers. This information is translated into monetary values according to the price list (as shown in Table 3.1a).

The large variation in trading methods has nothing to do with quality per se, but it does indicate the problem of finding a way to optimize the match between sellers' trees and buyers' wants. Form 6, to take one example, may be efficient, but if more was known about the trees prior to the harvesting, another buyer would perhaps have been willing to pay more for the same trees (cf. Athey and Levin 2001). If form 1 is used, buyers have much more information, and we get closer to the conditions of an auction. This may appear attractive from the point of view of the sellers, since they take no other risk than choosing among the alternatives. Of course, this comes at the cost of someone having to walk through the forest and mark (measure) all of the trees, and the fact that this form of trading is unusual, especially in the north of Sweden, may suggest that at least some actors are less happy with it. In conversation, however, the timber buyers described the additional information that the list of trees offered them as an advantage, noting that this information made it easier to calculate the value of the trees than it would have been under form 5, for example. Other informants viewed the marks in the forest as less "objective" than the measurements done after the harvesting. Buyers may prefer forms 2 or 3, since in these cases all facts are known except the volume and quality, and buyers will never pay more than what they can afford (and have stated in their price list). This method lets buyers predict the cost of access to timber or wood for pulp production.

But why do the sellers not harvest the trees first and then look for the best deal among competing buyers? Such a method is possible but in addition to its practical problems would imply that the seller take on high risk, since buyers might not need the trees. It might also be much harder to negotiate with

buyers, so that the seller would end up with less from the deal. Since the trees have to be fresh, harvested trees cannot be stored in the forest for more than a couple of weeks. The logs, furthermore, must be cut according to the length and dimensions specified by the buyer, and each buyer has at least some unique preferences. This strategy also presumes that the seller has the skill and the machines to harvest the trees personally, which is rare. Normally, these heavy and expensive-to-move machines operate in one area, which means that neither they nor their operators can be hired at short notice. Taken together, this is not an easy path for a small seller.

Each form of trading reflects a different way of handling quality and price uncertainty. The mere fact that there is an organization that measures the volume and grades the quality of timber reflects the distrust between the parties. Both sellers and buyers would ideally like to make optimal use of each log—the smallest unit of valuable wood. Some of the tall, straight, old pine trees may be worth considerable sums, since they are relatively rare and can be used for specific purposes. But given that the offer, that is, the tract to be harvested, often comprises a variety of trees, quality grades, and sizes (length, diameter, straightness, number of twigs, etc.), a single buyer may not be able to make optimal use of all the different logs, even if all of them are known in detail. Moreover, the branches of the tree may be used for energy, the lower end of the trunk for sawtimber, and the rest for pulpwood. If a buyer is to make optimal use of the entire tree, each production plant—usually a sawmill, sometimes combined with a pulp factory—must be able to utilize all or at least most parts optimally.

Recall that the forms of trading do not change the idea of quality, but shift the uncertainty between buyer and seller. The secondary market layer of business-to-business markets is important for redirecting the flows and improving matches between the needs and resources of firms in the industry. In most of the trading methods, however, sellers have to cope with the largest share of the uncertainty. The historical development of the industry is what helps us to understand the use of these trading forms in the timber markets.

Concluding Discussion

This chapter has taken a closer look at the market for standing timber, a market of renewable natural resources that is of great economic importance. Markets for natural resources have been largely neglected by sociologists. The Swedish timber market has its own peculiarities, culture, and history, all of which must be known in order to understand how it works and why it works the way it does. To include the historical dimension of this industry would reveal how the markets to a large extent are the result of attempts at organization. This market

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should also be understood in relation to other markets, and since it is, at least from a material point of view, a primary good market, the focus should be downstream and directed at the final consumer markets. But to focus attention only in this direction would miss the starting point of the market chain.

The industry needs more timber than its own forests can produce, and smaller, independent forest owners sell timber to industry buyers. Bargaining power is unevenly distributed between sellers and buyers, but the market power relations between buyers and sellers differ depending on the location of the market in Sweden. Power and market organization is one aspect that merits further study.

The chapter has discussed price, value, and quality in markets, with a focus on quality. Price and quality are essentially bound together in this market. The quality standard is stable, but prices vary. Nonetheless, sellers cannot easily compare prices between buyers, since the sellers' knowledge of their own tract(s) is suboptimal. This makes it hard to compare the different offers buyers make. None of the themes discussed is problematic as such; it is only when the temporality of trading plays a role that these factors, taken together, make actors face uncertainty.

It has been shown that ties are a way to diminish market uncertainty. The tie created between buyer and seller is often strong and long-lasting, and it is a way for buyers to establish the "flow" of goods—the timber. This means that those individuals representing the buying side purchase timber from "their" sellers in good times and in bad. The tie is indeed a "give and take" relationship that manages the uncertainty. These ties often correlate with friendship. Ties are one way to convince actors to strike deals even when the economic outcome is uncertain. Another important factor is the "technical brokerage" performed by the Timber Measurement Council, which at least ensures that quality is graded independently of buyers' and sellers' interests.

As in other industries, such as the garment industry (Aspers 2010), suppliers and buyers of timber are rarely concerned solely with the price, quality, or timely delivery of goods. It is the combination of these things that matters. In this industry, the goods are not affected by the entities trading, and timber is a standard market. The temporal structure adds an additional variable to this equation. The general finding of temporality has implications for the sociology of markets, and especially for developing our understanding of standard markets. Quality, value, and price are indeed different aspects of an economic transaction. In standard markets, quality (standards) is constitutive of what is traded. When it is easy to adjudicate quality, prices can be connected to, and often correlate with, the standard. The standard can be used to grade what one has. With a corresponding price list, one can value what one has or what one intends to purchase (if known) without actually taking part in the market. In the timber markets studied, we have seen that though the standards exist

and the prices are known, the actual quality of what is traded can only be known after the deal has been made. Economic value hence remains uncertain. This is the case in many natural resource markets, which are characterized by this temporal structure. But we have seen that the forest sector, with its long production time and its always singular tracts, makes the market problem more pronounced. The central problem is the temporal structure of the trade: good is being traded even as neither party has exact knowledge of what the economic result will be. Temporality is an issue in all economic trade, but it is pronounced in this case and other cases of natural resource trading.

A second finding is that trust is central to overcome the uncertainty manifested in the temporal lag between when a contract is first signed and when the outcome of the contract becomes known. Quality uncertainty—especially for sellers, for whom each deal may be very important—is a major issue to overcome. We can observe that in this market, as in others, the ties of personal relationships create a solution.

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