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Trust and the use of contracts under environmental uncertainties in Swiss wood market supply chains

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Context/Theoretical background/Research question

Contracts are key economic devices to enable efficient resource allocation while securing relation-specific investments (Grossman & Hart, 1986, Williamson, 1979). Yet, legal and economic scholars have frequently observed and studied transactions where no written or legally enforceable contracts are used. This has been shown to be the case in a seminal study in many manufacturing industries (Macaulay, 1963), but also in farmland contracts (Allen & Lueck, 1992). A variety of explanations for the use of contracts have been developed in the respective literature: The potential expropriation of quasi-rents after relation-specific investments is a key explanation for the use of contracts and has been tested extensively. But a variety of hypotheses exist for why the parties to a certain transaction may refrain from using a contract. Different reasons for the lack of contracts are discussed. Prohibitive transaction costs in relation to benefits – in particular if not all facets of the exchange can easily be contracted – make contracts unattractive, and the potential loss of reputation in a market when not conforming to an oral arrangement or frequent interactions with the same supply chain partner render alternatives, i.e. implicit contracts, feasible.

We analyze whether trust substitutes for contracts. If A trusts in B, why would she set up a contract? A contract request could signal mistrust and even lead to crowding out. In addition, with environmental uncertainties and therefore limited information, contracts can never be complete to cover all potential contingencies and thus become subject to ex post enforcement problems and renegotiation and could be deliberately left incomplete (Bernheim & Whinston, 1998) or not used at all.

The Swiss wood market is an ideal case to test these hypotheses, as a large fraction of forest managers do not use contracts. We can control for relation-specific investments explaining contract use, because the Swiss wood market is composed of four coexisting modes of supply chains with differing levels of integration. The forest manager can either harvest on his own and sell logged wood directly to a sawmill, or he can use a trader or a bundling and marketing organization (“bundlers”) as a market intermediary. The fourth option is to sell standing timber to a contractor, who then harvests the wood. This fourth option involves relation-specific investments, as some local knowledge is required to harvest efficiently. In addition, a contractor needs to enter and use the forest property and could potentially damage soil and trees, which may demand contingency plans and related contract clauses. Finally, the tree quality cannot be directly observed in standing timber, i.e. without seeing the profile. Therefore, this fourth option suggests that contract use is more likely when selling standing timber.

Methodology

We conducted a one-shot trust experiment with 106 out of a total of 149 public forest managers in the two cantons of Grisons and Aargau. The experiment captures trust in each of the supply chain modes, using the context of supply chains in the Swiss wood sector, i.e. traders, bundlers, and contractors. We



measure trust using an incentivized game. In this two player game, one player, player B, can promise to reward trust, but is free whether to keep the promise or not. The more optimistic the other player, player A, is about the probability that B keeps the promise, the higher he can choose the investment into the relation. The investment of player A is our measurement of trust.

Before the experiment, we conducted a survey on forest firm characteristics with a response from 118 of these forest managers, including the fractions sold to each supply chain type, the costs measured as a markup for using a certain supply chain, the duration of interacting with the same supply chain partner, and the dependent variable of the percentage share sold via written contracts.

Results

We found that only slightly more than one third of all forest managers in Grisons (36.2%) sell exclusively via written contracts, while none do so in Aargau. In both cantons, a fraction of around one third partially (39.2% and 29.8%, respectively) uses written contracts. Around one fourth of all forest managers in Grisons and more than two third in Aargau do not use written contracts at all.

Table 1: Fraction of foresters using contracts

Share of roundwood sold via contracts:	Share of foresters in	
	Grisons	Aargau
0%	24.6%	70.2%
1-99%	39.2%	29.8%
100%	36.2%	0.0%

Given the fractional dependent variable, we tested a variety of econometric model specifications, and find a very robust relationship for the role of trust. We find that trust in traders or bundlers does not significantly affect the use of contracts, while trust in contractors does. Trust in contractors significantly increases the share sold with written contracts. We test for two causal mechanisms and find both supported by the data. First, trust in contractors increases the share sold via this supply chain mode, which itself is significantly correlated with using contracts. Second, trust in the institution of contracting also directly increases the use of written contracts, when controlling for the share sold via contractors and an interaction term of both. Thus, we conclude that trust does not necessarily substitute for the use of written contracts and reject the respective hypothesis.

However, we find that the duration of a business relation significantly reduces the use of written contracts, while a higher markup in relation to selling directly to a sawmill increases the share sold with written contracts.

Conclusion

The hypotheses that trust and the frequency of interaction substitute for contracts are frequently proposed to explain the absence of written contracts in business relations. The frequency hypothesis is supported, but we do not find support for the trust hypothesis. Rather, trust in contracting arrangements appears to be crucial for choosing contractors, where relation-specific investments and contingency plans for environmental uncertainties make contracts more likely. Thus, the low share of written contracts in wood



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markets can be better explained by the transaction properties of the supply chain. If harvested wood is sold via traders, environmental uncertainties are absent and the transaction can be settled easily.

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