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A NOTE ON THE DUTY OF DISCLOSURE

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This letter studies the possibility of voluntary breach of contract in the presence of new information. If the information had to be disclosed prior to the agreement, it is shown by example that all individuals may be worse off than if the act of disclosure is itself voluntary.

1. Introduction

Imagine two people who sign a contract. Party 1 has information which party 2 lacks and from this information he knows that the agreement will leave party 2 worse off than before. After signing the agreement, the information becomes known to party 2 and he demands cancellation of the contract. Ought the legal system to accede to his demand?

When the information is gained by 'coincidence', without any search or effort, it would appear that there can be no objection to obliging the parties to disclose all relevant information before the signing of the agreement [see Kronman (1978)]. My aim in this short paper is to show, in contrast to this view, that the obligation to disclose may worsen the situation of *all* individuals in the society.

2. The example

In a market there are two agents, 1 and 2, and two divisible goods. Denote by the ordered pair (x, y) the bundle in which there are x units of the first good and y units of the second. Agent 1's initial bundle is $W_1 = (1, 0)$ and agent 2's is $W_2 = (0, 1)$.

Each of the goods has one of two qualities: G – good, B – bad. The quality of each good depends only on the state of nature and there are 4 equi-probable states of nature: GG, GB, BG and BB. In the state of nature XY the good in agent 1's possession is of quality X and agent 2's good is of quality Y.

Agent i has a utility function u_i which is a function of the quantity of the first good x, the quantity of the second good y, and of the state of nature w,

$$
\begin{aligned}
u_1(x, y, w) &= \sqrt{x} + \sqrt{2y}, && w \in \{\mathrm{GG}, \mathrm{BG}\}, \\
&= \sqrt{x}, && w \in \{\mathrm{GB}, \mathrm{BB}\}, \\
u_2(x, y, w) &= \sqrt{2x} + \sqrt{y}, && w \in \{\mathrm{GG}, \mathrm{GB}\}, \\
&= \sqrt{y}, && w \in \{\mathrm{BG}, \mathrm{BB}\}.
\end{aligned}
$$

Each agent is assumed to maximize his expected utility.

Note that each agent benefits from the good which is in the other's possession at the start of the trading, only if its quality is good, and benefits from his own good independently of its quality. (This is not a severe assumption since the example is insensitive to 'small' changes in the utility functions.)

The information available to each party before signing the contract is limited to the quality of his good only. Formally agent 1's partition of information is

$$I_1 = \{\{\mathrm{GG}, \mathrm{GB}\}, \{\mathrm{BG}, \mathrm{BB}\}\}.$$

Similarly agent 2's partition of information is

$$I_2 = \{\{\mathrm{GG}, \mathrm{BG}\}, \{\mathrm{GB}, \mathrm{BB}\}\}.$$

No trade is possible before the parties know the quality of their own goods.

After they have signed the contract, both parties find out about the true state of nature. There may arise a situation wherein one of the parties, i, might become aware that the other, j, has misled him by selling him a good of quality B. This is the place at which the law may interfere.

Two possible legal rules would be compared:

(a) Every agreement obligates the parties to uphold it and cannot be cancelled under any circumstances.
(b) If it becomes known to party i that party j entered the contract knowing with certainty that the agreement would be worse from i's point of view than not carrying out the agreement, then the 'misled' party, i, is entitled to cancel the agreement.

Let us now compare the competitive equilibrium allocations which are obtained under each of the legal rules. It is assumed that the parties know which legal rule is prevailing.

Rule (a). Given that $\tau_i \in I_i$ is the information set of agent i and given the price vector $(1, p)$, agent i will solve the problem

$$\max_{x,y} E_{\tau_i} u_i(x, y, w),$$

subject to

$$[(x, y) - W_i] \cdot (1, p) \leqslant 0, \qquad x, y \geqslant 0.$$

(Given that τ is a non-empty set of states of nature, $E_\tau Z$ denotes the conditional expectation of Z given τ.) Therefore, for all $\tau \in I_1$, agent 1 maximizes

$$\tfrac{1}{2}(\sqrt{x} + \sqrt{2(1-x)/p}) + \tfrac{1}{2}(\sqrt{x} + \sqrt{0}), \qquad 0 \leqslant x \leqslant 1,$$

and for all $\tau \in I_2$, agent 2 maximizes

$$\tfrac{1}{2}(\sqrt{2p(1-y)} + \sqrt{y}) + \tfrac{1}{2}(\sqrt{y} + \sqrt{0}), \qquad 0 \leqslant y \leqslant 1.$$

We thus derive the demand functions of the two agents

$$D_1(P) = (2p/(2p+1),\ 1/p(2p+1)),$$

and

$$D_2(P) = (p^2/(2+p),\ 2/(2+p)).$$

The vector $(1, p)$ is called a competitive equilibrium price vector if

$$D_1(p) + D_2(p) = W_1 + W_2 .$$

The unique competitive equilibrium price vector is (1, 1) and the appropriate allocation is (2/3, 1/3) for agent 1 and (1/3, 2/3) for agent 2.

Rule (b). Let w be a state of nature and let $w \in \tau_1 \in I_1$ and $w \in \tau_2 \in I_2$. Consider an agreement which involves i receiving the bundle R from j. Agent i knows that agent j will cancel the agreement if for all $t \in \tau_i$, $u_j(W_j - R, t) < u_j(W_j, t)$, and he himself will cancel the agreement if for all $t \in \tau_j$, $u_i(W_i + R, w) < u_i(W_i, w)$. Define

$$v_i(x, y, w) = u_i(W_i, w)$$

if given $w \in \tau_i \in I_i$ and $w \in \tau_j \in I_j$, for all $t \in \tau_j$, $u_i(x, y, t) < u_i(W_i, t)$, or for all $t \in \tau_i$, $u_j(W_j + W_i - (x, y), t) < u_j(W_j, w)$,

$$v_i(x, y, w) = u_i(x, y, w)$$

otherwise.

Given the price vector $(1, p)$ and given that $\tau_i \in I_i$ is the event known to i, agent i's problem is

$$\max E_{\tau_i} v_i(x, y, w)\,,$$

subject to

$$[(x, y) - W_i] \cdot (1, p) \leqslant 0, \qquad x, y \geqslant 0.$$

If agent 2 has a 'bad' good (τ_2 = {GB, BB}) then he will not offer any of his good. Likewise if agent 1's good has the 'bad' quality (τ_1 = {BG, BB}) there will be no trade. Trade will take place only if the state of nature is GG. In this state of nature agent 1 maximizes $\frac{1}{2}(\sqrt{X} + \sqrt{2y}) + \frac{1}{2}\sqrt{1}$ and agent 2 maximizes $\frac{1}{2}\sqrt{1}$ + $\frac{1}{2}(\sqrt{2x} + \sqrt{Y})$ and thus the demand functions are $D_1(p) = (p/(p+2),\ 2/p^2 + 2p)$ and $D_2(p) = ((1+p)/(1+2p),\ 1/(1+2p))$. The unique competitive equilibrium price vector is (1, 1), and the appropriate allocation is (1/3, 2/3) for agent 1 and (2/3, 1/3) for agent 2.

The following four tables summarize the competitive equilibrium allocations (the box formed by row X and column Y represents the state of nature XY):

	Rule (a)			Rule (b)	
	G	B		G	B
1's bundle					
G	2/3, 1/3	2/3, 1/3	G	1/3, 2/3	1, 0
B	2/3, 1/3	2/3, 1/3	B	1, 0	1, 0
1's utility					
G	$2\sqrt{2/3}$	$\sqrt{2/3}$	G	$\sqrt{3}$	1
B	$2\sqrt{2/3}$	$\sqrt{2/3}$	B	1	1

Under the duty of disclosure the expected utility of agent 1 is $\frac{1}{4}[3+\sqrt{3}]$, while without the duty it is equal to $\frac{1}{4}[6\sqrt{2/3}]$ which is greater. Thus the elimination of the duty improves the expected utility of agent 1 (and similarly for agent 2).

3. Conclusion

In this example the existence of the duty of disclosure prevented trade in three of the four states of nature. Each agent would have been better off in two of them, since he was prevented from acquiring useless goods in exchange for useful ones. However in the third state of nature the agent was worse off because he was prevented from misleading the other and exchanging bad goods in his possession for good ones.

Since the profit from misleading exceeds the loss from being misled, both individuals prefer to be misled at times and to mislead at others.

An examination of the conditions under which a law obligating disclosure is efficient or just, requires extensive research. In any event, I hope I have introduced an additional consideration in cases where information is obtained without search and the role of misleading is not exclusive to any of the agents.

The above example joins a list of paradoxical examples related to the role of information in markets with partial information, such as those given by Hirshleifer (1971), Green and Sheshinski (1975), Hart (1975) and Barro and Friedman (1977). This example is similar to the following one which is known from the 'folklore' of Game Theory: two people have to choose between two courses of action. The players agree that there are two equi-probable states of nature. The payoffs depend on the state of nature as represented below.

State 1

4	4	0	5
5	0	2	2

State 2

2	2	5	0
0	5	4	4

If the state of nature is known to the individuals, then their utility at each equilibrium in both states of nature is 2. If the state of nature is unknown to them (and assuming that they maximize their expected utility), then the relevant payoff matrix is

3	3	5/2	5/2
5/2	5/2	3	3

and the utility of each at equilibrium will be 3!!

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