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ON THE ECONOMIC VIRTUES
OF INCOMPETENCY AND DISHONESTY

by

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On the Economic Virtues of Incompetency and Dishonesty

Most people would agree with the statement that if incompetency and dishonesty were costless to eliminate their optimal level would be zero. The reasoning would be that incompetency is wasteful since it leads to mistakes while dishonesty is wasteful because if faulty information is relied on it can lead to suboptimal decisions. But the existence of dishonesty and incompetency can also have secondary effects which may be beneficial. In fact, in this paper I will present a simple example of a market with asymmetric information in which these second order effects dominate and present a clear case in which positive levels of incompetency and dishonesty are socially beneficial.

The intuition behind this seemingly paradoxical result is quite clear. In a market with asymmetric information in which consumers search for information, searching behavior can be dramatically influenced by the possibility that some firms are incompetent or dishonest. For instance, the possibility of dishonesty in such markets may make consumers more vigilant in their searching. This, in turn, might lead to better decisions on their part and greater economic efficiency despite the fact that some searchers obviously fall prey to the fraudulent behavior of some experts.

This paper is based on a series of theoretical and experimental papers written by Carolyn Pitchik and Andrew Schotter, Pitchik and Schotter (1984, 1985a, 1985b). For purposes of brevity I will refer to those papers whenever possible using both their results and notation.

The Model

As in Pitchik and Schotter (1985a) consider a town with N consumers and L experts. Each consumer owns a product in need of repair but is ignorant about the type of repair needed. (Since the experts know more about the products

condition, the market has asymmetric information.) The product can have either a major or a minor problem needing either a major or a minor repair whose prices are p_h and p_l respectively. The costs of repair is C_h and C_l respectively.

The fraction of products with major (minor) problems is $\epsilon(1-\epsilon)$. Of the experts α are incompetent while $(1-\alpha)$ are competent where competency is defined as an expert whose diagnosis is correct all of the time while incompetency implies that an incompetent expert makes a correct diagnosis a fraction μ of the time. It is assumed that a major repair fixes both a major and a minor problem while a minor repair fixes only a minor problem. The tasks for the agents in this model are that if you are a consumer you must find a way to search for opinions and decide on repairs while if you are an expert you must decide upon the fraction of time you intend to act honestly.

Honest behavior is characterized by:

1. Always offering an opinion according to the expert's best guess as to what is wrong with the product, and
2. Repairing the product in accordance with the opinion given.

Dishonest behavior is characterized by:

1. Always offering major opinions and
2. Fixing the product according to the experts best guess as to its problem.

Because $(p_h - C_l) \geq (p_h - C_h)$ incentives for dishonesty exist in the market. However, dishonesty has its risks. We assume that if an expert offers a major opinion on a major problem product and then performs a minor repair, he must repair the car again with a major repair at his own expense. Hence dishonesty is punished. Honest incompetency, however, i.e. recommending a minor repair on a major problem product is not punished -- the consumer is assumed to pay the cost of the mistaken repair. [This assumption does not affect the qualitative results of the model at all]. The question is: What will the

equilibrium configuration of honesty be and what impact does incompetency and dishonesty have on welfare?

To answer these questions we must describe the behavior of consumers and experts in the market. I will sketch the analysis of this behavior below [for a complete description see Pitchik and Schotter (1985a)].

Consumer Behavior

Under the assumption that consumers can search at most n times for opinions and that the cost per search e , is constant and suitably bounded (see Pitchik and Schotter (1985a) for this bound), DeGroot (1970) has characterized the optimal search strategy for a consumer. The strategy is characterized by a critical reservation number of minor opinions m^* and the following rule:

1. If during search m^* minor opinions are received, stop and choose a minor repair.

2. If during search the consumer has searched $k \leq n$, times and g minor opinions have been received then continue to search if $n-k+g \geq m^*$, otherwise stop and get a major repair.

Expert Behavior

Experts are assumed to maximize profits by offering opinions and repairs i.e. by choosing b_1 and b_2 where b_1 is the honesty fraction of an competent and b_2 the honesty fraction of an incompetent firm. Given p_h , p_l , C_h , and C_l , their profits are determined by their honesty choice and the opinions given by other experts -- since those other opinions determine whether these opinions are believed. Letting $P_1(P_2)$ be the probability that on a random search in the market a consumer with a minor (major) problem will receive a minor opinion, these numbers can be defined as follows (under the assumption that incompetent experts have sufficiently high diagnostic abilities):

$$P_1 = (1-\alpha)b_1 + \alpha b_2 \quad (1)$$

$$P_2 = \alpha(1-\mu)b_2 \quad (2)$$

From our definition of m^* , P_1 and P_2 we can define the probability that a consumer with a minor (major) problem will choose to get a minor repair as

$$r_{m^*}(P_1) = \sum_{i=m^*}^n \binom{n}{i} P_1^i (1-P_1)^{n-i} \quad (r_{m^*}(P_2) = \sum_{i=m^*}^n \binom{n}{i} P_2^i (1-P_2)^{n-i}).$$

Equilibria

An equilibrium in this model is a triple (m^*, b_1^*, b_2^*) such that if b_1^* and b_2^* was the actual mean honesty fraction existing in the market, then given the other parameters, m^* is a best response search strategy and given m^* , b_1^* , b_2^* no expert of any type has any incentive to change his honesty behavior. Hence, if (m^*, b_1^*, b_2^*) ever existed in the market, it would be perpetuated.

One obvious characteristic of interior equilibria in this model (i.e. equilibria in which $0 < b_1^*, b_2^* < 1$) is that experts of either type are indifferent between being totally honest and totally dishonest. By equating the profit functions of competent (incompetent) honest and competent (incompetent) dishonest experts it can be established that an interior equilibrium is characterized by P_1 and P_2 values which simultaneously satisfy the following two equalities: (see Pitchik and Schotter (1985) for details).

$$r_{m^*}(P_1) = \frac{(p_h - C_1)P_1}{(p_h - P_1)P_1 + P_1 - C_1} = R_1(P_1) \quad (3)$$

$$r_{m^*}(P_2) = \frac{(p_h - C_h - C_1)P_2}{(p_h - C_h) - C_1P_2} = R_2(P_2) \quad (4)$$

where as before $r_{m^*}(P_j) = \sum_{m^*}^n \binom{n}{i} (P_j)^i (1-P_j)^{n-i} \quad j = 1, 2.$

Once these values are determined, b_1 and b_2 are defined by (1) and (2). If no interior equilibrium exists then there do not exist P_1 and P_2 consistent with interior solutions to (1) and (2) for which (3) and (4) can be satisfied with equality. If $r_{m^*}(P_1) \geq R_1(P_1)$ for all $0 \leq P_1 \leq 1$, then total honesty is a best response for competent firms while if $r_{m^*}(P_2) \geq R_2(P_2)$ total honesty is a best response for incompetent firms.

In Pitchik and Schotter (1985) conditions are presented under which an interior equilibrium to this model exists.

On the Virtues of Honesty and Dishonesty

With the model specified we can finally investigate the questions of interest; the virtues of honesty and incompetency. To begin our discussion, consider the following proposition:

Proposition: In the model specified above, no all competent all honest equilibrium exists i.e. no equilibrium exists with $\alpha = 0$, $b_1 = b_2 = 1$.

Proof: If all firms were in fact totally competent and totally honest, then it would be optimal for consumers to search only once. But if consumers searched only once and experts knew this then no expert would be honest since their opinion would never be checked elsewhere. Hence, an all honest all competent equilibrium could not exist.

The introduction of a small fraction of incompetent experts in this market might indeed be beneficial since it could lead consumers to want to get second opinions about the diagnoses offered them -- they may be coming from honest but incompetent experts. Such second opinions can help police the honesty of firms and maintain high equilibrium honesty levels. Hence, we immediately can see a beneficial effect of incompetency on social welfare.

To illustrate this point and set the stage for discussing the affects of dishonesty in the model, consider a market with the following parameters:

$$n = 3$$

$$P_h = 4$$

$$P_1 = 3$$

$$C_h = 2$$

$$C_1 = 1$$

$$\epsilon = .78$$

$$\alpha = .90$$

$$\mu = .80$$

and $m^* = 1$.

Using these values in (3) and (4) indicates that total honesty is a best response for both types of firms, (i.e. $r_{m^*}(P_1) \geq R_1(P_1)$ and $r_{m^*}(P_2) \geq R_2(P_2)$) for all $0 \leq P_1, P_2 \leq 1$.

Using this fact and equation (1) and (2) we see that at equilibrium $b_1 = b_2 = 1$, $P_1 = .82$ $P_2 = .18$.

The question that arises is: Given the incompetency levels of the experts, is welfare maximized in this model at the all honest equilibrium. To answer this question consider the following welfare loss function for the market.

$$(1-\epsilon)(1-r_m(P_1))\alpha(1-\mu)(C_h - C_1) + \epsilon(b_2 r_m(P_2) + (1-b_2)(1-r_m(P_2))\alpha(1-\mu)C_1). \quad (5)$$

The first term represents the expected loss due to major repairs performed by incompetent diagnosticians for minor problem consumers who requested major repairs. The second term denotes the expected loss due to minor repairs performed by incompetent diagnosticians for major problem consumers who requested either minor or major repairs. Note that since for competent firms $\mu = 1$, they never perform inappropriate repairs. Hence they are never responsible for a loss of welfare. Their dishonesty, however, may lead to

consumers over paying for repairs. Since, at the equilibrium of our example $b_1 = b_2 = 1$, $P_1 = .82$ $P_2 = .18$ this welfare loss function takes a value of .382.

Now consider the all dishonest equilibrium to this model (proven always to exist in Pitchik and Schotter (1985a), when all incompetent experts are totally incompetent; i.e. $\mu = .50$). Faced with this configuration consumers do not bother to search since if all firms are dishonest search is uninformative. Hence given their priors and the costs of making mistakes they will choose that decision which minimizes their expected decision loss. In our example since the probability that any product has a major problem is .78, all consumers will simply demand a major repair on their product. Since $\mu = .50$ the best (loss minimizing) decision for incompetents is to fix all problems with major repairs. Hence the second term in the welfare loss function is zero and by evaluating the first term we find that the welfare loss at this new all-dishonest equilibrium is .198. In other words, welfare would be increased in this market if all experts were totally dishonest and totally incompetent.

The reason for this bizarre result is simple. If incompetent experts are honest in a market where most consumers have major problems, then they will sometimes recommend minor repairs for major problem consumers. Since at our original equilibrium $m^* = 1$, any consumer receiving such an opinion would stop searching and choose a minor repair. Hence, incorrect minor repairs would be performed by honest incompetent firms. Since in that market 90% of all firms are incompetent and all are honest, the number of such mistakes might be substantial. When all incompetents are totally dishonest and completely incompetent, however, they will always recommend a major repair and since $\epsilon = .78$, and $\mu = .50$ they will always perform a major repair when one is requested. As a result, the market never experiences minor repairs done for consumers with major problems. The only mistake made is when major repairs

are performed for consumers with minor problems. But since, in our example, 78% of consumers have major problems anyway, this mistake, in aggregate, is not that costly (remember competent firms never commit repair mistakes). This resolves our paradox.

Conclusion

This example points out a typical myopia on the part of many economic policy analysts. The myopia is to think strictly in partial equilibrium terms when in fact there may be significant general equilibrium implications to a policy which may yield totally counter intuitive or paradoxical effects. In our example, increases in dishonesty and incompetency, had substantial effects on the search behavior of consumers. When this effect is considered, we notice that welfare may increase as both dishonesty and incompetency increase.

Such a result is not a mere theoretical artifact. In an experiment run by Pitchik and Schotter (1984) to test this phenomenon, among others, it was noticed that price controls (i.e. forced lowering of the high price repair) when imposed upon an experimental market decreased both economic efficiency and consumer welfare. The reason for this result should be clear in light of our discussion here. When the price of a major repair is lowered, the cost of making a mistake and getting a major repair performed when a minor repair would have been sufficient, $(P_h - P_l)$, decreases. If such a decrease either makes them more easily convinced to get a major repair (i.e. m^* increases) then firms can take advantage of this laxity and behave more dishonestly. This can easily lead to greater fraud on the part of experts and more repair mistakes in general, thus decreasing welfare and consumer satisfaction. This is exactly what was observed by Pitchik and Schotter (1984).

One final thought on incompetency and honesty concerns the individual consumer in the market. While our argument above involved aggregate welfare, one may falsely assume that while incompetency may be socially beneficial

he/she would always be better off privately by patronizing a competent firm. Even this may not be true, however. If the market equilibrium involves high levels of honesty for incompetents but low levels of honesty for competent experts the probability of receiving a correct opinion from an incompetent expert may be greater than that same probability for a competent expert. For instance, the probability of receiving a minor opinion from a competent expert given you have a minor problem is simply b_1 while the same probability from an incompetent firm would be $b_2\mu$. Hence if $b_2 \geq b_1/\mu$ you would be better off patronizing an incompetent firm. Of course, if you have a major problem you would always be better off patronizing a competent firm, unless, ironically, all incompetents were dishonest, in which case you would be indifferent.

While one should not mistake this paper as an apologia for incompetency, its moral still may be: "Support your local incompetent, he may be more of a friend than you thought".

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