Mutual Certification of Experts in Credence Goods Markets

David Ong

Introduction

- For the same reason that consumers need experts like doctors, they cannot evaluate experts; They are not experts themselves.
- Hence, they can't know when their "expert" is incompetent, or would cheat them.
- At the same time, there are many expert associations ,eg, the American Medical Association which certify experts. However, why a consumer would trust the expert who certifies more than the expert certified is not obvious, especially if we consider the two expert case.
- If they did this, it must be due to a process of "mutual certification".
  - Together they are more trustworthy than alone.
- Certification means incompetence is ruled out.
- In the two expert case, it's clear that some kind of mutual certification must occur first.

Main contributions

- This paper presents a theory of how mutual certification might occur.
- Assuming risk aversion of experts and consumers, where consumers get more utility from getting a competent expert over an incompetent one than the best one over than the competent one.
- Given association members can perfectly discern quality of other experts, show
  - If experts know each other's quality better than consumers, and consumers are risk averse, then
    - The public should believe that members of associations are lower risk
    - It will be best for experts to join associations and for consumers to buy only from associations.
  - Mere associations in some sense mutually certify; Certification here means: no terrible experts.
  - The public knows that members mutually screen, the variance of the quality members will be lower.

Main contributions

- Present an empirically testable; associations should be more likely where both experts and consumers are very risk averse regarding quality of expert ,e.g., surgery, but not where people not so risk averse, e.g., traditional medicine markets, and where experts can discern each other's quality.
- Government intervention is not required.
- Describe experimental test.
- Application to groups who share reputations in general, e.g., study groups.

Basic Setup for the Credence Goods Market

- Credence goods market:
  - Consumers do not observe the experts' service quality distribution, but only their own draw.
  - Expert can do a good job and have a bad outcome, bad job and a good outcome.
  - When harmed, won't be able to tell if they were unlucky or the experts' service quality was low.
  - Furthermore, detection rate for bad quality is low and consumers can be harmed without knowing it.
- Experts can observe each others' service quality distribution with some noise.

- Players
  - Types t∈T.
  - An association of n members is an n dimensional Cartesian product of Ts.
  - Association members share the same price.
- Information
  - Quality is determined by the distribution of outcomes.
  - Consumers only observe their realization with a particular expert, if the expert is not a part of an association, or the joint realization of all experts in an association.
- Actions
  - Consumer may buy from any expert.
  - Experts may form an association by engaging in cheap talk. All members of the association charges the same price.
- Preferences
  - Both consumers are risk averse.

- Prop. 1: A type T will want to join the association A with lower average type iff the decrease in expected PS from being associated with lower types is made up for by the decrease in PS from lower variance.
  - Condition 1: PS(E(T),var(T))-PS(E(A),var(T))< PS(E(A),var(A))-PS(E(A),var(T))
- Prevents unravelling.
- If condition 1 holds nontrivially, then some types would be prevented from joining the association. This should increase mean and lower variance of quality for association members.

- Prop. 2: Consumers will want to buy from an association if the increase in price is made up for by the decrease in risk.
  - Condition 2:
  - $0<CS(PT,E(T),var(T))-CS(PTE(A),var(T))< CS(PA,E(A),var(A))-CS(PA,E(A),var(T))$
- Prop. 4: More concave the preferences of either consumer or experts, or less observability bad draws, the larger the equilibrium association.
  - Variance effect of conditions 1 and 2 becomes larger.
  - Higher risk aversion or larger risks creates greater need for certification.

- Prop. 5: Larger quality difference, less likely experts will join.
  - Price is shared. Condition 1 is less likely to be met.
- Corollary 6: Experts of extremely high quality and lack of risk aversion will not want to join and those of extremely low quality will not be able to join.
  - Risk neutral consumers and experts don't care about variance. Condition 1 above is not met.
- Corollary 8: Markets where experts themselves have difficulty judging each other's quality, or where neither consumers nor experts are risk averse (traditional medicine markets), there will not be associations.
  - If quality is difficult to discern, then L is not screened. Condition 1 need not hold. Therefore, for a given price, condition 2 is less likely to hold.
- Corollary 9: When experts do not form associations, and consumers really do care about bad outcomes, consumers should infer that either quality of service is highly varied, or experts can't tell each other's quality with sufficient accuracy.
  - Follows immediately from Corollary 6,8.

Example

- Three experts A, B, C and many consumers.
- Each expert is of quality H, M or L.
  - Good outcomes are not guaranteed by higher quality experts: only more likely.
  - PS(E(H),var(H))-PS(E(A),var(H))< PS(E(A),var(A))-PS(E(A),var(H))
  - In particular, if consumer surplus is CS(H)>CS(M)>0>CS(L), then the only possible associations are HHH,HHM,HMM,MMM,LLL.

Mutual Certification Mutual selection and “Cheap Talk”

- An association is a common name: members of an association share a reputation which is correlated with their own.
  - In certifying each other, their reputations become correlated. (Assuming that high quality sellers are both better judges of their colleagues and have more to lose in being associated with bad colleagues.)
- The association will not unravel due to adverse selection because risk averse experts of high quality will still want to be associated with lower quality experts, because that lowers their reputation risk.
- Intuition from portfolio theory: rational to include lower mean, higher variance assets in portfolio as long as they are not perfectly correlated with the higher mean, higher variance asset.

Incompetent Experts will be Squeezed Out

- If association is formed and the consumer realizes, this, then they should put low probability on facing the very lowest quality expert in the association.
- Only the lowest quality experts would ever want to join an association with other lowest quality expert.
- Suppose the market for plastic surgery, where it may not matter very much if they got the best surgeon, as opposed to a good surgeon, but they really don't want to get a bad surgeon, because the marginal utility of beauty is concave (risk averse assumption).