(Doubly) Irreversible Disclosure

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I study a dynamic disclosure game between an agent and a decision maker where the agent's decisions to start disclosing and to stop disclosing an information process are both irreversible. The underlying state of the world θ is either good ($\theta = 1$) or bad ($\theta = 0$). Time is continuous and has an infinite horizon. Over time, the agent privately receives conclusive bad signals that arrive according to a Poisson process. He receives an opportunity to disclose this information process to the decision maker, and can start disclosing at any time after such an opportunity arrives. Once the agent starts disclosing, he must disclose all subsequent signal arrivals (or lack thereof), while his information prior to disclosure remains private. After disclosure starts, it either exogenously ends at a random time observable only to the agent, or the agent chooses a time to stop disclosing. When disclosure stops, the decision maker takes an action that affects the payoff of both players. While the decision maker prefers an action $a \in \mathbb{R}$ that matches the state, the agent prefers higher actions regardless of the state.

The agent controls the time period over which information flows to the decision maker, but has no control over the content of the information being disclosed. In this paper, I study the optimal time to start disclosing and stop disclosing when the disclosure protocol exhibits such features. I characterize the unique Markov perfect equilibrium of the game that survives the Divinity Criterion.

At any point in time, the agent can be either of the two types: *informed* if he has observed a conclusive bad signal, or *uninformed* if he has not. In equilibrium, the agent starts disclosing as soon as he gets an opportunity regardless of his type. While disclosure is in progress, upon observing a signal, both the agent and the decision maker's beliefs jump down to 0; the agent stops disclosing immediately and

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the decision maker takes action 0. Upon observing no signal, there exists a waiting time such that the uninformed agent stops with probability 1 at the end of the waiting time. The informed agent is indifferent between stopping at any point during this waiting time. The rate at which he stops feeds into the decision maker's belief evolution which in turn keeps the informed agent's expected payoff from stopping constant over time. The decision maker takes an action that is equal to her posterior belief at the time disclosure stops.

I highlight three features of this equilibrium.

First, in the continuation game where the agent chooses a time to stop disclosing, the agent faces a tradeoff between a more favorable action and higher risks. The conclusive bad news information structure implies that the decision maker's belief increases in the absence of signals. In addition, the agent's stopping strategy implies that the longer disclosure is left open, the higher the likelihood that the agent has not seen a signal prior to disclosure. Therefore, a longer disclosure time induces a higher action in the absence of signals. However, a longer disclosure time also increases the probability of signal arrivals, which exposes the agent to higher risks.

Second, the presence of the informed agent enables information transmission. If the agent is uninformed and the decision maker knows that, they share a common belief. Because posterior belief is a martingale, stopping at any time would induce the same expected action. Because of discounting, the agent stops disclosing immediately and the decision maker takes an action that is equal to the common belief. The possibility that the agent is informed forces the uninformed agent to keep disclosure open longer to "prove" that he is uninformed, enabling information transmission.

Lastly, the equilibrium features a novel dynamic between the start disclosing time and the stop disclosing time: the later the agent starts disclosing, the longer he leaves disclosure open. While waiting to start, the agent becomes more optimistic if he remains uninformed, but the probability that he becomes informed is also higher. Longer waiting (to start) time exacerbates information asymmetry between the agent and the decision maker. The now-more-optimistic uninformed agent needs to disclose longer to reduce the difference in beliefs between him and the decision maker.