KARL-FRANZENS-UNIVERSITÄT GRAZ
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Disclosure Theory

Alfred Wagenhofer

Once more: Why theory?

SFB/Transregio 266
ACCOUNTING FOR TRANSPARENCY

Research on Corporate Transparency
Element 4: Why theory?

Joachim Gassen

Theoretical and empirical research

- **Empirics inform theories**
  - Observed associations need to be understood
  - New phenomena trigger development of theory
  - Sense of economic significance of events and effects
- **Theories inform empirics**
  - Generates possible explanations for mixed empirical evidence
  - Provides chain of causality to explain associations
  - Generates novel predictions that can be tested
  - Generates alternative hypotheses

Characterizing theory papers

- **Stylized depiction of real phenomena with particular assumptions about situation and behavior**
  - A priori conjecture what is an "important" economic tradeoff
  - Deliberately ignoring possible other interactions
- **Clear sequence of events and interaction among players**
  - Puts discipline on thinking and arguments
  - Insights into causal relationships
- **Consistent derivation and explanation of results**
  - Assumptions are explicit → intersubjective verifiability
  - Math "language" provides rigor and precise reasoning
  - Provides conditions for result to arise

What makes an interesting theory paper

- **"Generate new insights and challenge our existing way of thinking" (*Chen* and *Schipper* 2016)**

- **For peer theorists**
  - Focus on strategic interaction of players
  - Endogeneity is key
  - Provides novel insights from interactions
  - Can provide "counter-intuitive" results

- **For empirical researchers**
  - Rationalizes observed behavior and the underlying mechanism
  - Isolates key ingredients of what drives results
  - Provides H_0 hypothesis against which to test significance
  - Helps select controls
  - Provides ideas for more specific predictions and tests and to distinguish among alternative explanations

Voluntary disclosure models

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Element 5: Unraveling

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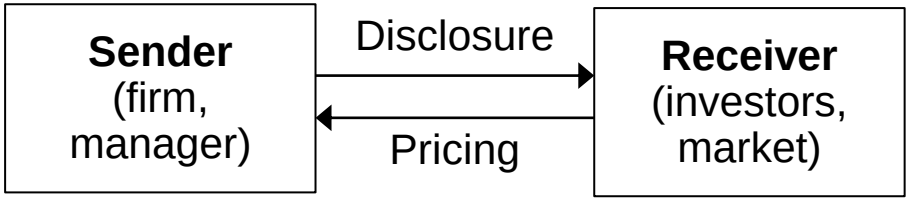
Voluntary disclosure

- **Observation: Some firms voluntarily disclose private information, others do not**

- **Theory**
  - Helps understand economic drivers for disclosure
  - Explains voluntary disclosure behaviors
  - Serves as basis for assessing effects of disclosure regulation

- **Types of models**
  - Unravelling
  - Cheap talk
  - Signaling
  - *Other settings: Contracting can induce disclosure*
    Tool: revelation principle

Recall: Unravelling



- **Key assumptions**
  - Sender has private information
  - Disclosure must be truthful, being silent is the alternative
  - Sender wants to maximize market price *P* set by Receiver in a competitive market
  - Receiver holds rational expectations (price protection)
- **Result**
  - Unique equilibrium: full disclosure
  - Reason: skeptical beliefs about information when observing nondisclosure

Learning to Disclose: Disclosure Dynamics in the 1890s Streetcar Industry *

Thomas Bourveau[†] **Matthias Breuer**[‡] **Robert Stoumbos**[§]

This version: December 2020

Abstract

We study the descriptiveness of the "unravelling" prediction in the 1890s streetcar industry. In this historical setting, capital-intensive streetcar companies gain the opportunity to disclose their earnings to dispersed investors via a new, quarterly newspaper supplement. We document that a quarter of the companies withhold their earnings from the first supplement, inconsistent with the "unravelling" prediction. However, almost all these companies start disclosing within the next couple of supplements, with the relatively-better companies among the remaining non-disclosers initiating disclosure and leaving the pool of non-disclosers each quarter. We interpret these stylized facts through the lens of a disclosure model featuring level-k thinking. Our model estimates that a substantial share of the companies employs a lower level of strategic thinking in the first supplement. This deviation from rational expectations appears to explain the initial failure of the "unravelling" prediction. Over time, companies appear to adopt higher levels of thinking, contributing to the rapid convergence to an (almost) full disclosure equilibrium. Collectively, our evidence is consistent with market forces yielding an (almost) full disclosure equilibrium in the medium to long run through repetition and learning.

https://ssrn.com/abstract=3757679

Schantl and Wagenhofer (2021) Motivation

- **Disclosure of material information**
  (e.g., Rule 10b-5 under the Securities Exchange Act of 1934)
- **Long-standing debate on the relationship between litigation risk and corporate disclosure**
- **Mixed empirical evidence**
  - **More litigation risk associated with *more* disclosure**

    Idea: "preemption effect" – firms aim to preempt future bad news by disclosing and warn investors early
  - **More litigation risk associated with *less* disclosure**

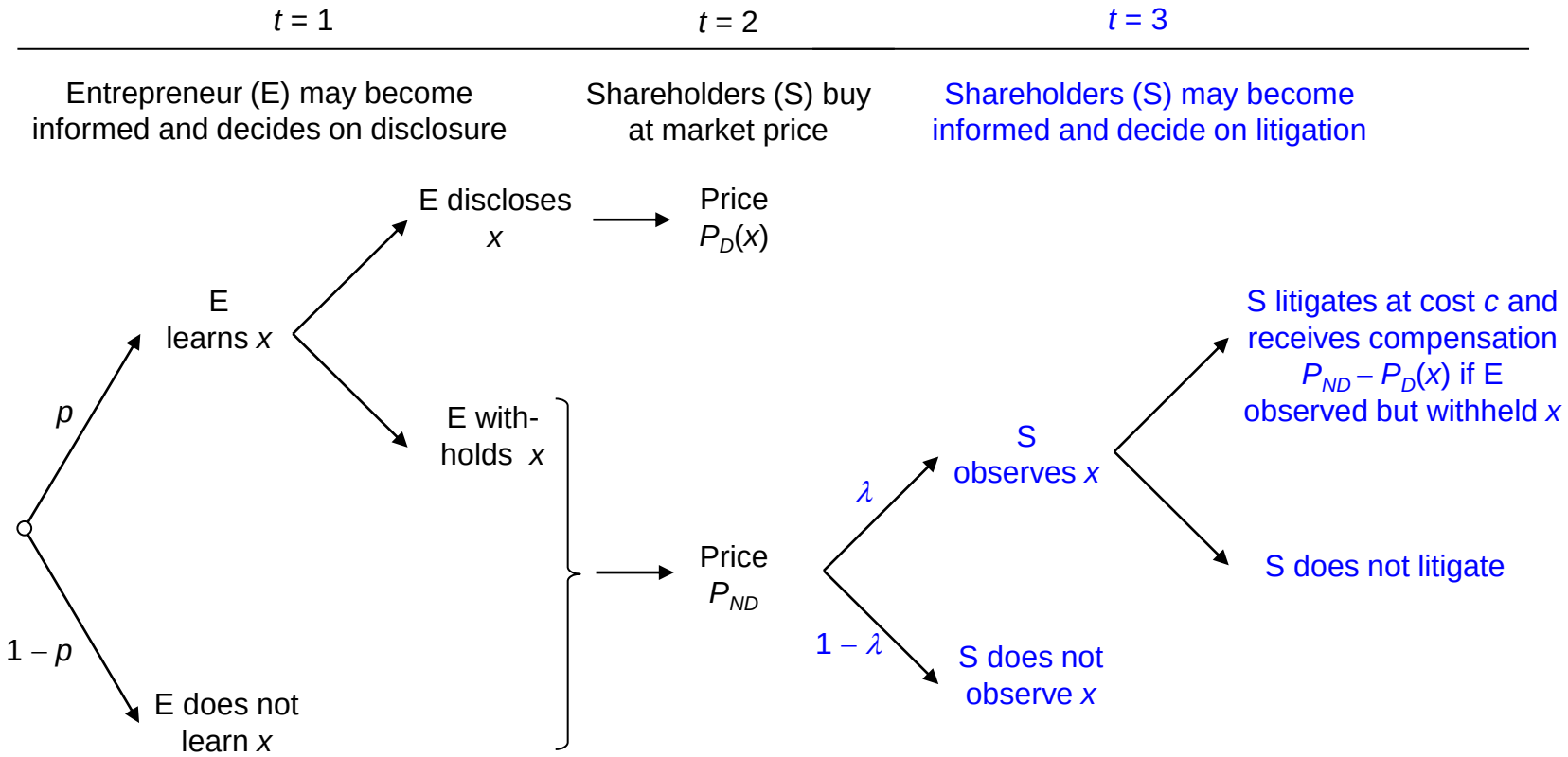
    Idea: "chilling effect" – litigation risk discourages firm from disclosing forward-looking information for fear that later divergent actuals induce litigation
  - **Also recognizing endogeneity between disclosure and litigation** (*Field* et al 2005)
- **Motivation for more theory**

  Prior theoretical papers with the friction of uncertainty about information
  - Litigation: *Trueman* (1997), *Dye* (2017)

Uncertainty about information
Sequence of events

Basic model:
***Dye* (1985)**

Extension: Litigation
***Schantl* and *Wagenhofer* (2021)**



Developing intuition

- **Is litigation beneficial to shareholders?**
  - Very costly litigation → no litigation
    Reverts to basic *Dye* (1985) model
  - Costless litigation → always litigate
    Litigation is insurance for investors → pay higher price on nondisclosure
- **What happens in between?**
  - Key: litigation is strategic and depends on shareholders' expectation of
    (i) whether information was withheld *and*
    (ii) how unfavorable the information was, as compensation depends on the damage ($t = 3$)
  - This expectation is shaped by disclosure strategy ($t = 1$),
    which is again dependent on market price reaction ($t = 2$)
- **Firm's disclosure decision ($t = 1$) takes all that into account**

Without formal modeling it is difficult to predict equilibrium disclosure strategy, price upon non-disclosure, and economic effects

Conducting the formal analysis

Backward induction

- **Investors' litigation decision** ($t = 3$) **based on** *ND* **and** *x*

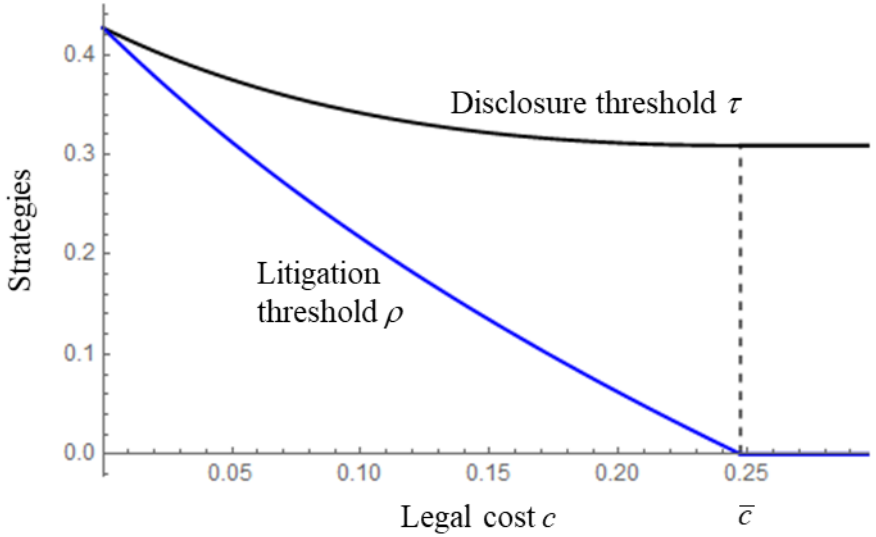
  $$\Pr(\text{informed}|x, ND; \hat{\tau}) \left[P_{ND} - \hat{P}_D(x)\right] - c \geq 0$$

  - Sue if $x \leq \rho$, where $\rho < \hat{\tau}$
- **Investors' pricing decision** ($t = 2$) **based on** *ND*
  - Disclosure: price $P_D(x) = x$
  - Nondisclosure: Conjecture that entrepreneur withholds if $x < \hat{\tau}$
    Price $P_{ND} = E[x|ND; \hat{\tau}]$ + expected compensation from litigation
- **Entrepreneur's disclosure** ($t = 1$) **based on** *x*
  - Disclose if $x \geq \hat{P}_{ND}$
  - Whether there is, or is not, litigation does not directly affect deciscion because of proportional damage compensation

Bayesian equilibrium: Conjectures must be fulfilled

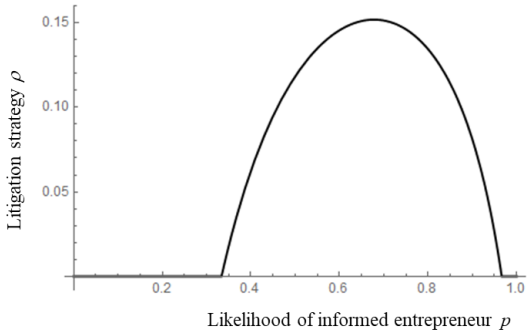
Results

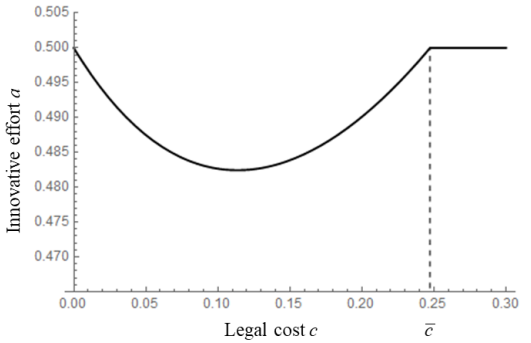
- **Characteristic of equilibrium disclosure strategy is retained: disclosure only of favorable information**
- **But: Likelihood of disclosure depends on litigation risk**
  - Measure: Legal cost *c* of shareholders who sue
- **Equilibrium strategies**



Testable predictions

- **Ex ante litigation risk** ($\lambda\rho$)
  - Increases if litigation cost c decreases or if λ increases
- **Price efficiency** (at $t = 2$)
  - Higher litigation risk lowers price efficiency
- **Likelihood that E was informed** (p)
  - Increases disclosure (lowers τ)
  - Increases and then lowers litigation
- **Additional penalties on entrepreneur**
  - High penalties induce withholding only intermediate information and effectively avoid litigation
- **Welfare effects: entrepreneur's innovation**
  - Increase of litigation cost c lowers and then increases ex ante innovation incentives (that generate the project)





Discussion time