

**Applications of Economics of Information in Management and Accounting**  
**PhD Seminar, Fall 2018 – New York University**

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Thursdays, 2-5pm (in 10-181 KMC)

This course develops tools from information economics to study the incentives of and strategic interactions among: firm insiders, market participants and financial intermediaries. Common to these studies is that agents hold private information that is valuable to other parties. The range of applications includes: voluntary and mandatory disclosure, earnings management, financial analysts and the structure of managerial compensation and performance measures.

Based on student's interest and background, if time allows we can add additional topics and readings.

**Course Requirements:**

- For every class, except for the first class, write a short summary of one of the papers covered in that class (see instructions at the end of this document). You can also choose a paper from the background reading (papers without \* in the reading list).
- Class presentation of one paper.
- Problem sets.
- Final research project.

**Course Readings:**

- (i) The recommended textbook for the first part of the class is “*Contract Theory*” by Bolton and Dewatripont, MIT Press, 2005. (from hereon referenced as BD (2005)).
- (ii) Items marked with a (\*) on the following list will be covered in some detail in class.

**I. Signaling, Noisy Rational Expectations, Market Microstructure and the Value of Information**

We will study in detail Spence (1973) model of costly job market signaling. This basic model serves as a basis to many, more advanced, signaling models. The basic model will facilitate our study of fundamental concepts in signaling models, including single crossing property, and equilibrium refinements that aim at selecting among multiple equilibria. We will briefly discuss Cheap-Talk signaling models, pioneered by Crawford and Sobel (1982), in which non-verifiable signals do not impose any direct cost, but yet informative equilibria may exist.

To better understand how stock prices are determined in a rational expectations market and what is the value of private information to agents, we will study three mechanisms for security pricing in rational expectations settings. We will start with the classical noisy rational expectation model of Grossman and Stiglitz (1980). The paper studies a setting with one risky asset and three types of traders: informed strategic traders, strategic but uninformed traders and non-strategic noise traders. The paper derives the market-clearing price for the risky asset as well as the equilibrium in the market for information, in which strategic traders can choose whether to acquire information and become informed or whether to save the information acquisition cost and remain uninformed.

Then, we will cover two fundamental market microstructure models: Kyle (1985), which studies the market price is set by a market-maker who only observes the total order flow, which is the aggregation of the demand of a strategic informed investor and non-strategic noise traders; and Glosten and Milgrom (1985), which studies how a market maker sets a bid and an ask prices when trading against a trader, that can be either informed or uninformed.

All of these models demonstrate the value that investors obtain from having private information.

## **Readings**

\*Chapter 3 in BD – Signaling.

\*S. Grossman and J. Stiglitz, On the Impossibility of Informationally Efficient Markets, American Economic Review, June 1980.

\*A. Kyle, Continuous Auctions and Insider Trading, Econometrica, November, 1985.

\*L. Glosten and P. Milgrom, Bid, ask and transaction prices in a specialist market with heterogeneously informed traders, Journal of Financial Economics, 1985.

M. Spence, Job Market Signaling, Quarterly Journal of Economics, August 1973.

V. Crawford and J. Sobel, Strategic Information Transmission, Econometrica, November 1982.

## **II. Earnings Management**

Empirical literature and anecdotal evidence suggest that managers can, and often do, manipulate their disclosure. The theoretical literature has studied earnings management in settings in which biasing the report is costly to the manager/firm (costly signaling models), as

well as settings in which biasing the report imposes no direct cost on the manager/firm (cheap-talk models). Our focus will be on costly signaling settings.

Another distinction in the literature is between settings in which the manager's contract/incentives are given exogenously and settings in which the managers' contracts/incentives are optimally set by the principal (shareholders). We will mostly study settings in which the manager's contract is given exogenously, and if time allows, we will also discuss settings in which the manager's contract is optimally set by a principal. The manager's report serves as the performance measure in determining the manager's compensation, and when designing the contract the principal takes into account that the manager may manipulate his report. We may also discuss a dynamic earnings management setting, in which the manager takes into account the effect if his current period's manipulation on future manipulation costs and the market reaction to his future reports.

### **Readings – Earnings Management**

\*Stein, J. C., Efficient Capital Markets, Inefficient Firms: A Model of Myopic Corporate Behavior, Quarterly Journal of Economics 1989.

\* Fisher, P. and R. Verrecchia, Reporting Bias, The Accounting Review, April 2000.

\*Guttman, Kadan and Kandel, A Rational Expectations Theory of Kinks in Financial Reporting, The Accounting Review, 2006.

\*Guttman and Marinovic, Debt Contracts in the Presence of Performance Manipulation, working paper, 2017.

Beyer, Guttman and Marinovic, Earnings Management and Earnings Quality: Theory and Evidence, working paper, 2017.

Dye, R., Earnings Management in an Overlapping Generation Model, Journal of Accounting Research, 1988.

Beyer, Guttman and Marinovic, Optimal Contracts with Performance Manipulation, Journal of Accounting Research, 52, 2014.

Arya, A., Glover, J. and Sunder, S., Earnings Management and The Revelation Principle, Review of Accounting Studies, 1998.

M. Kirschenheiter and N. Melumad, Can “Big Bath” and Earnings Smoothing Co-exist as Equilibrium Financial Reporting Strategies? Journal of Accounting Research, 2002

Sankar, M., and Subramanyam, K.R. 2001, Reporting discretion and private information communication through earnings, Journal of Accounting Research 39: 365-386.

Burgstahler, D. and I. Dichev, Earnings management to avoid earnings decreases and losses, *Journal of Accounting and Economics* 24: 99-126, 1997.

DeGeorge, F., J. Patel, and R. Zeckhauser, Earnings management to exceed thresholds, *Journal of Business* 72: 1-33, 1999.

### III. Voluntary Disclosure

Studies in the early 80's (Milgrom 1981, Grossman 1981, Grossman and Hart 1980) demonstrated that when the payoff of a privately informed agent/firm, the sender, is monotone in the receiver's (market) beliefs about the sender's type and disclosure and verification of the sender's private information is costless (and there are no other frictions) - full disclosure prevails as the unique equilibrium. The intuition for this "unraveling result" is straightforward and parallels the intuition for Akerlof's (1970) market for lemons arguments.

The subsequent theoretical literature on voluntary disclosure has been focusing on settings in which one (or more) of the premises of the unraveling result does not hold, and as a result, partial disclosure occurs in equilibrium. We will start by studying static settings in which disclosure is costly (e.g., due to proprietary costs), pioneered by Verrecchia (1983), and settings in which the market is uncertain whether the sender is endowed with private information, pioneered by Dye (1985). In these two settings, the equilibrium is characterized by a disclosure threshold. We will also study settings in which disclosure is not verifiable and the sender/firm can manipulate the report, at a cost. Finally, as is more representative of corporate disclosure environment, we will study dynamic settings in which the sender/firm may be endowed with multiple pieces of private information, over multiple periods of time; and settings in which one firm's disclosure (or lack of) affects the disclosure decisions of other firms.

#### Readings - Voluntary Disclosure

\*Chapter 5 in BD

\*Verrecchia, Discretionary Disclosure, *Journal of Accounting and Economics*, 5, 179-194, 1983.

\*Dye, Disclosure of Nonproprietary Information, *Journal of Accounting Research* 23, 123-145, 1985.

\*Jung and Kwon, Disclosure when the market is unsure of information endowment of managers, *Journal of Accounting Research* 26, 146-153, 1988.

\*Beyer and Guttman, Voluntary Disclosure, manipulation and Real Effects, *Journal of Accounting Research* 50, 2012.

\*Guttman, Kremer and Skrzypacz, Not Only What But Also When – A Theory of Dynamic Voluntary Disclosure, American Economic Review 104 (8), 2014.

\*Frenkel, Guttman and Kremer, The Effect of Analyst Coverage on Corporate Voluntary Disclosure, Price Efficiency and Liquidity, working paper, 2018.

Einhorn and Ziv, Intertemporal Dynamics of Corporate Voluntary Disclosures, Journal of Accounting Research, 46 (3), 2008.

Acharya, DeMarzo and Kremer, Endogenous Information Flows and the Clustering of Announcements, American Economic Review 101 (7), 2011.

Beyer, Cohen, Lys and Walther, The Financial Reporting Environment: Review of the Recent Literature, Journal of Accounting and Economics, 2010.

Shin, Disclosure and Asset Returns, Econometrica, 71, pp. 105-133, 2003.

#### **IV. Financial Analysts**

Financial (sell side) analysts are one of the major sources of information in capital markets. These financial intermediaries affect the information in capital markets both directly, through information they disclose, and indirectly, through their effect on firm managers' disclosure decisions.

There are many important decisions that financial analysts have to make, for example: what firms to cover, how much effort to put into acquiring information, what kind of information to disclose (e.g., earnings forecast, recommendations, target price, revenue growth), when to issue their disclosure, whether to bias their disclosure. The answer to the above questions depends on analysts' incentives. The last 15 years the institutional and regulatory environment in which analysts operate has changes a lot. Moreover, there is also variation among analyst's incentives in a given point in time, e.g., affiliated versus unaffiliated analysts, analysts that work for brokerage house and hence care about trading commissions versus analysts that do not benefit from trading commissions.

We will study several models that address some of the above questions and generate empirical prediction and insight into analysts' behavior.

#### **Readings - Financial Analysts**

\*Fischer, P. and P. Stocken, Analyst Information Acquisition and Communication, The Accounting Review, 2010.

\*Beyer and Guttman, The Effect of Trading Commissions on Analysts' Forecast Bias, The Accounting Review, 2011.

\*Guttman, The Timing of Analysts' Earnings Forecasts, The Accounting Review, 2010.

\*Morgan and Stocken, An Analysis of Stock Recommendations, RAND Journal of Economics, 2003.

Hayes R., The Impact of Trading Commission Incentives on Analyst's Stock Coverage Decision and Earnings Forecasts, Journal of Accounting Research.1998.

C. Aghamolla, Analyst herding with endogenous leadership, information acquisition, and bias, working paper 2017.

## V. **Other Topics**

If time allows, and based on the students' interest, we may cover additional topic. Examples of potential topics are: Accounting Disclosure and Real Effects, Auditing, High Order Beliefs, Bayesian Persuasion.

### **Short Summary of Papers**

For each class, except for the first class, choose one of the papers that we will cover in that day and write a short summary of the paper (1-3 pages). You can also choose a paper from the background reading (papers without \*).

In your summary, please address the following questions:

- What is the main research question?
- What is the setting of the model (players, timeline, objective functions and additional assumptions)?
- What is the main result of the paper?
- What do you think is the main contribution of the paper (to the extent that you know the relevant literature)?
- Which of the assumptions you believe are just simplifying assumptions and which are critical (for either tractability or to obtain the main result)?
- What in your view is the weakness of the paper (if any)?