

Incentive issues in finance:

Optimal contracts and equilibrium

Bruno Biais

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When markets are perfect and complete, financial structure is irrelevant (Modigliani Miller, 1958). When markets are imperfect, however, financial contracts affect welfare and value. Focusing on a major imperfection, moral hazard, we will analyse the optimal design of financial contracts and their equilibrium consequences.

First, we will consider optimal contracting and incentives in partial equilibrium. Starting with the one period case, we will introduce the basic notions of incentive compatibility and pledgeable income (Holmstrom & Tirole, 1997). Then we will turn to the two-period case, within which most of the economic intuitions of the dynamic model can be obtained (in line with Bolton and Scharfstein, 1990). Building on this, we will study the infinite horizon discrete time model (DeMarzo and Fishman 2007a and b, Clementi and Hopenhayn 2006, Biais, Mariotti, Plantin and Rochet, 2007) and its continuous time limit (Sannikov 2008, DeMarzo and Sannikov 2006, Biais, Mariotti, Rochet and Villeneuve 2010, He 2009, Zhu 2013, DeMarzo, Fishman, He, and Wang, 2012).

Second, we will extend the analysis to an equilibrium framework, and study the interaction between incentives and general equilibrium effects. We will study the equilibrium dynamics of financial managers's rents (Axelson and Bond 2015, Biais and Landier 2019), the consequences of incentive constraints on equilibrium risk-sharing (Bolton and Oehmke 2015, Biais, Heider, Hoerova 2016 and 2019) and on asset pricing (Biais, Hombert, Weill 2019).

Outline

- 1) Optimal contracts in partial equilibrium
 - 1.1) One period
 - 1.2) Two periods
 - 1.3) Infinite horizon discrete time
 - 1.4) Infinite horizon continuous time
- 2) Optimal contracts in general equilibrium
 - 2.1) Equilibrium dynamics of agency rents
 - 2.2) Moral hazard and equilibrium risk sharing
 - 2.3) Incentive constrained equilibrium set pricing

References

- Axelson, U. and Bond, 2015, "Wall Street occupations: An equilibrium theory of overpaid jobs", *Journal of Finance*, 1949-1996.
- Biais, B and A. Landier, 2015, "Endogenous agency problems and the dynamics of rents," Working paper, HEC.
- Biais, B., F. Heider, M. Hoerova, 2016, "Risk sharing or risk taking? Counterparty risk, incentives and margins", *Journal of Finance*. pp 1669--1698.
- Biais, B., F. Heider, and M. Hoerova, 2019, "Variation margins, fire sales and information constrained optimality," Working paper, HEC.
- Biais, B., T. Mariotti, G. Plantin, and J.-C. Rochet. 2007. "Dynamic Security Design: Convergence to Continuous Time and Asset Pricing Implications." *Review of Economic Studies*, 345--390.
- Biais, B., T. Mariotti, J.-C. Rochet and S. Villeneuve. 2010. "Large Risks, Limited Liability and Dynamic Moral Hazard." *Econometrica*. 73-118.
- Bolton, P. and D. Sharfstein. 1990. "A theory of predation based on agency problems in financial contracting." *American Economic Review*. 93--106.
- Bolton, P. and M. Oehmke, 2015, "Should Derivatives be Privileged in Bankruptcy?," *Journal of Finance* 70, 2353--2394.
- Clementi, G.L., and H. Hopenhayn. 2006. "A Theory of Financing Constraints and Firm Dynamics." *Quarterly Journal of Economics*. 229--265.
- DeMarzo, P., and M.J. Fishman. 2007a. "Agency and Optimal Investment Dynamics." *Review of Financial Studies*. 151--188.
- DeMarzo, P., and M.J. Fishman. 2007b. "Optimal Long-Term Financial Contracting." *Review of Financial Studies*. 2079--2128.
- DeMarzo, P., and Y. Sannikov. 2006. "Optimal Security Design and Dynamic Capital Structure in a Continuous-Time Agency Model." *Journal of Finance*, 2681--2724.
- DeMarzo, P., M. Fishman, Z. He and N. Wang, 2012, "Dynamic agency and the q theory of investment", *Journal of Finance*. pp 2295-2340.
- He, Z., 2009, "Optimal Executive Compensation when Firm Size Follows Geometric Brownian Motion," *Review of Financial Studies*. pp. 859-892.
- Holmström, B. and J. Tirole. 1997. "Financial Intermediation, loanable funds, and the real sector." *Quarterly Journal of Economics*. 663--692.
- Modigliani, F. and M. Miller. 1958. "The cost of capital, corporate finance, and the theory of investment." *American Economic Review*. 261--297.
- Tirole, J. 2006. *The Theory of Corporate Finance*. Princeton University Press.
- Zhu, J., 2013, "Optimal contracts with shirking", *Review of Economic Studies*. pp 812--839.