

Nolan Miller
Abstracts of Published and Accepted Papers

1. "Efficiency in Partnerships with Joint Monitoring," *Journal of Economic Theory*, **77** (2), December 1997, 285-299.

Abstract: This paper examines deterministic partnerships where a single partner observes the actions taken by a subset of the other partners and issues a report conditional on that observation. No other partner has any additional information. In such a model, whenever the observing partner can see the action chosen by at least one other partner, the efficient action vector can be sustained in a perfect Bayesian equilibrium by sharing rule that exhibits budget balance and limited liability

2. "The Equivalence of Price and Quantity Competition with Delegation," *RAND Journal of Economics*, **32**(2), Summer 2001, 284-301, with Amit Pazgal.

Abstract: In a two-stage differentiated-products oligopoly model, profit-maximizing owners first choose incentive schemes in order to influence their managers' behavior. In the second stage, the managers compete either both in prices, both in quantities, or one in price and the other in quantity. If the owners have sufficient power to manipulate their managers' incentives, the equilibrium outcome is the same regardless of how the firms compete in the second stage. If demand is linear and marginal cost is constant, basing the manager's objective function on a linear combination of the firm's profit and its rival's profit is sufficient for the equivalence result.

3. "Relative Performance as a Strategic Commitment Mechanism," *Managerial and Decision Economics*, **23**(2), March 2002, 51-68, with Amit Pazgal.

Abstract: Can managers' personality traits be of use to profit maximizing firm owners? We investigate the case where managers have a variety of attitudes toward relative performance that are indexed by their type. We consider two stage games where profit maximizing owners select managers in the first stage, and these managers, knowing each other's types, compete in a duopoly game in the second stage. The equilibria of various types of competition are derived and comparisons are made to the standard case where managers are profit maximizers. We show that managers' types can be used as a strategic commitment device that can increase firm profits in certain environments.

4. "The Effects of Environmental Regulation on Technology Diffusion: The Case of Chlorine Manufacturing," *American Economic Review*, **93**(2), May 2003 (Papers and Proceedings), 431-435, with Lori D. Snyder and Robert N. Stavins.

Abstract: We use a hazard model to estimate the effect of environmental regulation on the diffusion of membrane cell production technology in the chlorine manufacturing industry. We estimate the effect of regulation on both the adoption of the membrane technology at existing plants and on the exit of existing plants using older technologies. We find that environmental regulation did affect the diffusion of the cleaner technology in the chlorine industry. However, it did so not by encouraging the adoption of membrane cells by existing facilities, but by reducing the demand for chlorine and hence encouraging the shutdown of facilities using the environmentally inferior options.

5. "Strategic Trade and Delegated Competition," with Amit Pazgal. *Journal of International Economics*, **66**(1), 2005, 215-231.

Abstract: Strategic trade theory has been criticized on the grounds that its predictions are overly sensitive to modeling assumptions. Applying recent results in duopoly theory, this paper considers three-stage games in which governments choose subsidies, firms' owners choose incentive schemes for their managers, and then the managers compete in the product market. We show that if firms' owners have sufficient control over their managers' behavior, then the optimal strategic trade policy does not depend on the mode of product-market competition, i.e., whether firms compete by setting prices or quantities.

6. "Pricing Health Benefits: A Cost Minimization Approach," (2005). *Journal of Health Economics*, **24**(5), 2005, 931-949.

Abstract: We study the role of health benefits in an employer's compensation strategy, given the overall goal of minimizing total compensation cost (wages plus health-insurance cost). When employees' health status is private information, the employer's basic benefit package consists of a base wage and a moderate health plan, with a generous plan available for an additional charge. We show that in setting the charge for the generous plan, a cost-minimizing employer should act as a monopolist who sells "health plan upgrades" to its workers, and we discuss ways tax policy can encourage efficiency under cost-minimization and alternative pricing rules.

7. "Eliciting Informative Feedback: The Peer Prediction Method," with Paul Resnick and Richard Zeckhauser (2005). *Management Science*, **51**(9), September 2005, 1359-1373.

Abstract: Many recommendation and decision processes depend on eliciting evaluations of opportunities, products, and vendors. A scoring system is devised that induces honest reporting of feedback. Each rater merely reports a signal, and the system applies proper scoring rules to the implied posterior beliefs about another rater's report. Honest reporting proves to be a Nash equilibrium. The scoring schemes can be scaled to induce appropriate effort by raters and can be

extended to handle sequential interaction and continuous signals. We also address a number of practical implementation issues that arise in settings such as academic reviewing and online recommender and reputation systems.

8. "Screening Budgets," with Alex Wagner and Richard Zeckhauser (2006). *Journal of Economic Behavior and Organization*, **61**(3), 351-374.

Abstract: How should an organization's center allocate resources to units under its control which are better informed? Even with conscientious productivity reviews, important information will remain asymmetrically held. If units value their own expenditures more than those of their peers, they will seek excess budgets and expenditures. Fortunately, budget authorities can infer productivities from units' expenditure patterns across spending categories and over time. Optimal screening budgets reward more productive units with greater overall budgets. Such screening provides significant welfare gains over traditional fixed or reallocable budgets. Empirical results for a large electricity and infrastructure provider fit an important version of the model.

9. "Budget or Target: The Choice Between Input and Output Strategies," with Amit Pazgal (2006). *RAND Journal of Economics*, **37**(2), Summer 2006, 391-415.

Abstract: In many competitive environments, players need to commit either to a specific goal they will achieve (an output target) or to the resources they are willing to expend in pursuit of that goal (an input budget). We model this situation as a two-stage game where players may compete either by setting input and letting their output follow from the environment ("leading input"), or by setting output and letting the input levels required to support the output targets follow ("leading output"). We show that when each player's output is increasing (decreasing) in his rival's input, leading input (output) dominates leading output (input).

10. "Possibly-Final Offers," with Nikita Piankov and Richard Zeckhauser (2006). *Journal of Economics and Management Strategy*, **15**(3), Fall 2006, 789-819.

Abstract: A price-setting seller faces a buyer with unknown reservation value. We show that if the buyer is sufficiently risk averse, the seller can benefit from employing a Possibly-Final Offer (PFO) strategy. In a PFO, if the buyer rejects the seller's initial offer the seller sometimes terminates the interaction. If the seller does not terminate, he follows up with a subsequent, more attractive offer. As the buyer's risk aversion increases, the seller's expected profit under the optimal PFO approaches the full-information profit. These results extend to contexts with endogenous commitment, multiple types of buyers, multidimensional objects, and nonseparable utility functions.

11. "Insurer-Provider Integration, Credible Commitment, and Managed Care Backlash" (2006). *Journal of Health Economics*, **25**(5), 861-876.

Abstract: People distrust managed care organizations (MCOs) more than traditional health plans. This phenomenon has become known as “managed-care backlash.” Using a model of the interaction between insurers, physicians, and patients, this paper identifies two possible motivations for MCO backlash. The first, which comes from traditional health plans’ superior ability to credibly commit to providing better than least-cost care, is efficiency promoting. The second, which arises when patients are able to obtain higher-benefit treatments through renegeing on their initial insurance contracts through “doctor shopping,” may reduce efficiency.

12. “Provider Choice of Quality and Surplus,” with Karen Eggleston and Richard Zeckhauser (2006). *International Journal of Health Care Finance and Economics*, **6**, 103-117.

Abstract: We study the quality choices of institutional health-care providers, such as hospitals, assuming that the utility function of the key organizational decision maker includes both quality of care and financial surplus. We are primarily concerned with how changes in outside claims—particularly proportional outside claims—on the provider’s financial surplus affect his choice of quality. We use the term “rate of surplus retention” to refer to the fraction of surplus remaining after deducting all such claims. Using the Arrow-Pratt coefficient of relative risk aversion as a measure of curvature of the provider’s utility-from-money function, we show that increasing the surplus retention rate increases (decreases) quality if the provider’s coefficient of relative risk aversion is greater than (less than) 1.

13. “Mechanism Design with Multidimensional, Continuous Types and Interdependent Valuations,” with Scott Johnson, John Pratt, and Richard Zeckhauser (2007) *Journal of Economic Theory*, **136**(1), 476-496.

Abstract: We consider the mechanism design problem when agents’ types are multidimensional and continuous, and their valuations are interdependent. If there are at least three agents whose types satisfy a weak correlation condition, then for any decision rule and any $\epsilon > 0$ there exist balanced transfers that render truthful revelation a Bayesian ϵ -equilibrium. A slightly stronger correlation condition ensures that there exist balanced transfers that induce a Bayesian Nash equilibrium in which agents’ strategies are nearly truthful.

14. “Advertising Budgets in Competitive Environments,” with Amit Pazgal (2007). *Quantitative Marketing and Economics*, **5**(2), 131–161.

Abstract: Firms can approach advertising competition either by setting advertising budgets (as in the percentage of sales method) or target sales levels (as in the objective and task approach). We study firms’ incentives to adopt one or the other posture using a two-stage model of duopolistic competition. In the first

stage, each firm chooses to commit either to an advertising budget, letting its sales follow from the market response function, or to a desired sales level, promising to adjust its advertising spending accordingly. In the second stage, firms choose the actual levels of their advertising budget or sales target. When prices are exogenous, we show that, due to strategic effects, if a firm benefits from its rival's advertising (as when advertising increases awareness of the product category) then setting an advertising budget dominates setting a sales target. On the other hand, if a firm is harmed by its rival's advertising (as when advertising increases the firm's share of a fixed market), then committing to a sales level dominates. We extend these results in several directions and show that when firms engage in price competition as well as advertising the nature of advertising and product-market competition interact to determine whether setting an advertising budget or sales target dominates.

15. "Giffen Behavior and Subsistence Consumption," with Robert Jensen (2008).
Forthcoming, *American Economic Review*.

Abstract: This paper provides the first real-world evidence of Giffen behavior, i.e., upward sloping demand. Subsidizing the prices of dietary staples for extremely poor households in two provinces of China, we find strong evidence of Giffen behavior for rice in Hunan, and weaker evidence for wheat in Gansu. The data provide new insight into the consumption behavior of the poor, who act as though maximizing utility subject to subsistence concerns, with both demand and calorie elasticities depending significantly, and non-linearly, on the severity of their poverty. Understanding this heterogeneity is important for the effective design of welfare programs for the poor.