RESEARCH STATEMENT FOR HOLGER MUELLER

Since joining NYU’s Stern School of Business in 2001, I have been working on a fairly broad set of topics in the areas of Corporate Finance and Corporate Governance. Most of my research is theory oriented. However, I have recently begun to also write empirical papers (one on family ownership and labor relations and two others on the interaction between corporate governance and product market competition). My plan for the foreseeable future is to do both theory and empirical work in the areas of Corporate Finance and Corporate Governance.

My research falls into three categories:

1) Corporate governance, including ownership structure and internal organization.
2) Optimal financial contracting, including venture capital and financial intermediation.
3) Early (pre-NYU) theory work.

Corporate Governance

The first three papers that I would like to talk about are empirical studies.

In “Does Corporate Governance Matter in Competitive Industries?” (3rd round at Journal of Financial Economics), Xavier Giroud, a Ph.D. student at NYU Stern, and I investigate a hypothesis that was first formulated by Adam Smith and Sir John Hicks, and which is implicit in the “survivorship” theories by Alchian, Friedman, and Stigler, namely, that managerial slack is first and foremost a problem of firms in non-competitive industries. By contrast, managers of firms in competitive industries are under constant pressure to reduce slack and improve efficiency, or else they will not survive. We test this hypothesis using exogenous variation in corporate governance in the form of 30 Business Combination (BC) laws passed in the U.S. on a state-by-state basis between 1985 and 1991. These laws, which make hostile takeovers more difficult, are widely believed to weaken corporate governance and increase the opportunity for managerial slack. Consistent with the notion that BC laws increase the opportunity for managerial slack, we find that, after the laws’ passage, operating performance (ROA) of firms incorporated in passing states drops by 0.6 percentage points on average. However, and consistent with the notion that product market competition limits the extent to which
managers can slack off, we find that the effect is close to zero and insignificant in competitive industries. While ROA drops by 1.5 percentage points for firms in the highest HHI (Herfindahl-Hirschman Index) quintile, it drops by only 0.1 percentage points for firms in the lowest HHI quintile. When we examine where the drop in ROA is coming from, we find that overhead costs, input costs, and wages all increase after the laws’ passage, but only so in non-competitive industries. This is consistent with a “quite life” hypothesis, whereby managers insulated from both hostile takeovers and competitive pressure seek to avoid “cognitively difficult” activities, such as haggling with input suppliers, labor unions, and units within the firm demanding bigger overhead budgets. We find further supporting evidence when we examine the stock-price reaction upon the announcement of the BC laws. While firms in non-competitive industries experience a significant stock price decline, firms in competitive industries experience a small and insignificant stock price impact.

In a follow-up paper, “Corporate Governance, Product Market Competition, and Equity Prices” (working paper), Xavier Giroud and I examine whether the above findings also extend to firm-level corporate governance. Effectively, we revisit Gompers, Ishii, and Metrick’s (GIM, 2003) work documenting that better firm-level governance is associated with higher equity prices, higher firm value, and higher operating performance. Irrespective of whether we look at equity prices, firm value, or operating performance, we consistently find the same pattern: The effect is small and insignificant in competitive industries, it is large and significant in non-competitive industries, and it is monotonic in the HHI. For instance, the monthly alpha generated by GIM’s governance hedge portfolio is small (0.30%) and insignificant in the lowest HHI tercile, it is larger (0.64%) and marginally significant in the medium HHI tercile, and it is largest (1.47%) and highly significant in the highest HHI tercile. Likewise, the effect of governance on firm value documented by GIM is monotonic in the HHI in most years (13 out of 17 years), it is always small and insignificant in the lowest HHI tercile, and it is positive, economically large, and almost always (16 out of 17 years) significant in the highest HHI tercile. We also address criticisms of GIM in the literature showing that analysts were not surprised about the effects of governance, implying that the positive alpha found by GIM is likely due to an omitted variable bias. While we confirm that the average analyst forecast error is indeed small and insignificant, we find that the forecast error in the highest HHI tercile is large and significant. Thus, analysts were surprised about the effects of governance in precisely those industries in which governance matters to begin with, namely, non-competitive industries. Whether the
In “Family Firms, Paternalism, and Labor Relations” (2nd round at American Economic Journal: Macroeconomics), Thomas Philippon and I show that differences in the quality of labor relations across countries can explain the cross-country differences in ownership concentration (measured as ultimate, i.e., “family”, ownership) documented by La Porta, Lopez-de-Silanes, and Shleifer (1999). We find that, controlling for differences in minority shareholder protection, countries in which labor relations are hostile have more family ownership than do countries with cooperative labor relations. Importantly, it is not just some aspect of labor relations that matters, but it is precisely the quality of labor relations: Neither labor union power nor labor regulation is significant in our regressions. Neither are measures of trust and social capital, law enforcement, income inequality, private control benefits, and measures of a country’s left-right political orientation. To establish causality, we argue that differences in the quality of labor relations across countries are, at least partly, the outcome of historical and cultural developments. In an intriguing book, historian Colin Crouch (1993) shows that differences in the quality of labor relations among European countries can be attributed to political struggles between the emerging European liberal states and the Catholic church in the 19th and late 18th centuries. Indeed, when we instrument our measure of the quality of labor relations with a measure reflecting the severity of state-church struggles in the 18th and 19th centuries, we find that the quality of labor relations has a causal effect on the extent of family ownership. Moreover, using the methodology in Rajan and Zingales (1998), which exploits within-country variation at the industry level, we find that, controlling for industry and country fixed effects, industries that are more labor dependent have relatively more family ownership in countries with worse labor relations. Finally, using actual strike data in place of our survey measure of the quality of labor relations, we find that differences in strike activity among Western countries in the 1960s can predict cross-country differences in ownership concentration thirty years later.

The following papers are theory pieces related to issues of corporate governance, internal organization, and ownership structure.

In “CEO Replacement under Private Information” (3rd round at Review of Financial Studies), Roman Inderst and I consider the optimal joint design of CEO compensation and the board’s replacement policy in a setting in which a CEO obtains a private interim
signal indicating the quality of the match between the CEO and the firm. The first-best efficient replacement policy is to replace the CEO whenever the signal lies below a certain cutoff, in which case the expected firm value under the incumbent CEO’s continued leadership lies below the expected firm value under a potential replacement CEO. The difficulty in implementing the first best is that the CEO’s signal is private information and, moreover, that the CEO is inherently biased towards continuing, which makes the truth-telling problem non-trivial. Importantly, the CEO’s bias toward continuation does not come from exogenously specified private benefits of control. Rather, it arises endogenously under the optimal compensation scheme, which must promise the CEO ex-post quasi rents in case he continues to incentivize him to work hard at the ex-ante stage. In the model, the fundamental tradeoff faced by the board is between mitigating CEO entrenchment, i.e., minimizing the gap between the first-best cutoff signal and the CEO’s privately optimal (i.e., second-best) cutoff signal, and minimizing CEO’s rents. The optimal compensation scheme consists of high-powered on-the-job incentive pay and, in certain parameter regions, severance pay. Offering the CEO severance pay is costly in the model, as each dollar of severance pay must be matched with a dollar of expected on-the-job pay to keep the CEO from shirking. Importantly, the optimality of high-powered on-the-job incentive pay in the model does not derive from the need to incentivize the CEO at the ex-ante stage: Any compensation scheme that promised the CEO sufficient ex-post quasi rents can accomplish this goal. Rather, high-powered on-the-job incentive pay is optimal because it implements a given level of CEO entrenchment at least cost, i.e., with the minimum amount of rents that must be granted to the CEO.

In “Tender Offers and Leverage” (Quarterly Journal of Economics, 2004), Fausto Panunzi and I revisit the famous free-rider problem in tender offers that was first pointed out by Grossman and Hart (1980). In that paper, as well as in the large subsequent literature, it is assumed that the raider finances his bid with cash out of his own pocket. In reality, however, and in particular during the 1980s takeover wave, bids are often financed with substantial portions of debt. Raiders typically set up a shell company that issues the debt, and, upon succeeding with the tender offer, combine the shell company with the target firm in a second-step merger. Effectively, the debt issued by the shell company is backed by the combined firm’s assets and cash flows. This yields the main result of the paper: The indebtedness of the shell company lowers the combined firm’s post-takeover share value, thus reducing the incentives for target shareholders to hold out in the tender offer and mitigating the free-rider problem. In a sense, a leveraged two-step acquisition (“bootstrap acquisition”) can thus implement an
outcome that is similar in spirit to the dilution mechanism envisioned by Grossman and Hart, except that (i) it is consistent with the law and legal practice in the United States, and (ii) it is widely used in practice. In addition to showing how the use of leverage can lubricate a takeover deal in a Grossman-Hart type setting with free-riding shareholders, the paper provides a discussion of the legality of bootstrap acquisitions, with a focus on the second-step merger. Besides, the paper analyzes the role of leverage in going-private transactions in which minority shareholders are cashed out (“freeze-out merger”) as well as the role of bankruptcy costs and defensive leveraged recapitalizations for takeover premiums and the efficiency of the market for corporate control. Berk and DeMarzo (2007), in their MBA-level textbook *Corporate Finance*, spend two pages (pp. 894-896), and Tirole (2006), in his Ph.D.-level textbook *The Theory of Corporate Finance*, spends about one page (pp. 433-434), laying out the main arguments of my paper.

In “Inside vs. Outside Ownership: A Political Theory of the Firm” (RAND Journal of Economics, 2001), Karl Wärneryd and I consider the distribution of surplus in a closed firm, such as a partnership. In the absence of complete contracts, the partners engage in costly rent-seeking activities to tilt the division of surplus in their personal favor. For example, a partner may divert firm resources to finance private activities and claim that the money was used for legitimate business purposes. As rent-seeking activities are wasteful, the firm’s objective is to minimize them. The paper derives conditions under which it is optimal for the partnership to go public, or more generally, to sell the firm to outside owners. While there are now two levels of wasteful distributional conflict—first, the outside owners must “fight” against the insiders (i.e., the former partners), and then the insiders fight over whatever they managed to retain in the first-stage conflict—the total deadweight loss from distributional conflict may be smaller than under the partnership structure. Intuitively, that the insiders must fight collectively against the outside owners creates a free-rider problem in rent-seeking, leading to potentially low equilibrium levels of wasteful conflict. Also intuitively, equilibrium rent-seeking expenditures are minimized if the insiders fight against a single outside owner. A single outside owner faces no free-rider problem of his own, maximizing the amount of surplus that can be appropriated by outside owners, which in turn minimizes the amount of surplus over which the insiders can subsequently fight, and therefore also the insiders’ equilibrium rent-seeking expenditures.

In a follow-up paper, “Distributional Conflict in Organizations” (European Economic Review, 2007), Roman Inderst, Karl Wärneryd, and I consider a similar setting as above. Instead of focusing on outside ownership as a way to ameliorate costly distributional
conflict, however, the focus is on the optimal design of hierarchy. Contrary to what has been frequently argued in the literature, the paper shows that hierarchical multi-divisional organizations may involve a lower deadweight loss from distributional conflict than do “flat” organizations, despite having more rounds of wasteful conflict. The intuition is similar to the one laid out above, namely, organizing productive units into multiple divisions creates free-rider problems in rent-seeking, which is good in the present context because rent-seeking expenditures are wasteful. The paper applies this insight to capital budgeting procedures, corporate divestitures, and the transition from the “U-form” to the “M-form” organization by U.S. firms in the 1920s.

**Optimal Financial Contracting**

All of the papers that I have written in this area are theory pieces.

In “Financing A Portfolio of Projects” (Review of Financial Studies, 2007), Roman Inderst, Felix Münich, and I consider the implications of contractual provisions found in venture partnership agreements that limit a venture capital fund’s initial capital and make it difficult to add more capital once the initial fund is raised. We consider an investor who initially finances two projects. Under “unconstrained finance,” the investor has sufficient (financial or human) capital to refinance both portfolio projects. In contrast, under “constrained finance,” the investor can only refinance one portfolio project. Refinancing by outside investors is more costly, or impossible, due to a lemons problem at the refinancing stage. As contracts are assumed to be incomplete, there is bargaining at the refinancing stage. Constrained finance has both costs and benefits. First, the investor’s stronger bargaining position at the refinancing stage may weaken entrepreneurs’ *ex-ante* incentives to exert effort. Moreover, as the investor can refinance at most one project, positive-NPV projects may not be refinanced. On the other hand, as projects must have not only a positive NPV at the refinancing stage, but one that is higher than that of competing portfolio projects, entrepreneurs’ incentives to exert effort may be improved. Effectively, the entrepreneurs compete in a tournament for scarce informed capital at the refinancing stage. For projects with low *ex-ante* success probabilities—the sort of projects typically financed by venture capitalists—the benefits of constrained finance are likely to outweigh the costs.

In “Informed Lending and Security Design” (Journal of Finance, 2006), Roman Inderst and I examine the decisions of lenders to finance projects after screening them.
Screening generates an informative, albeit private, signal on which the lender bases her accept or reject decision. As the lender does not internalize the full costs and benefits from the project, the decision is generally inefficient. Specifically, the lender may be “too conservative,” in which case she rejects all negative- but also some positive-NPV projects. Alternatively, the lender may be “too aggressive,” in which case she accepts all positive- but also some negative-NPV projects. Using an optimal contracting framework with a continuum of cash flows, we derive the optimal security that minimizes the inefficiency associated with the lender’s credit decision. Unlike most existing security design models, the objective is thus to mitigate an incentive problem on the part of the lender (not the borrower). The uniquely optimal security when the lender is too conservative is standard debt. Standard debt maximizes the lender’s payoff from financing low-NPV projects, thus maximizing her payoff from precisely those projects that she inefficiently rejects. By the same token, the uniquely optimal security when the lender is too aggressive is levered equity. Levered equity minimizes the lender’s payoff from financing low-NPV projects, thus minimizing her payoff from precisely those projects that she inefficiently accepts. Whether the lender is too conservative or aggressive is endogenous and depends on observable project characteristics. In equilibrium, projects that are likely to break even are financed with debt, while less profitable projects are financed with equity.

In a follow-up paper, “A Lender-Based Theory of Collateral” (Journal of Financial Economics, 2007), Roman Inderst and I consider a similar setting as above. Unlike above, however, the focus is not on the optimal security design—the follow-up model has only two cash flows—but on the role of collateral. The paper develops a novel theory of collateral that, unlike existing theories, is not based on borrower moral hazard or adverse selection. Applying the same logic as above, collateral is optimal when the lender is too conservative, because it improves the lender’s payoff from precisely those low-NPV projects that she inefficiently rejects. If the borrower can pledge sufficient collateral, then the lender’s credit decision may become first-best optimal. (It is not optimal to fully insure the lender against all cash-flow risk, however, for she would then either accept or reject all projects.) The main focus of the paper is on deriving testable implications that help to distinguish our lender-based theory of collateral from theories based on borrower moral hazard or adverse selection. (In a recent empirical study, Jiménez, Fumás, and Saurina (2009) explicitly test our model and find broad support for it.) For example, our model predicts that, controlling for observable borrower risk characteristics, collateralized loans are more likely to default ex post, which is consistent with the empirical evidence. Theories of collateral based on borrower moral
hazard or adverse selection tend to make the opposite prediction, namely, that collateralized loans are safer, not riskier. The model also predicts that technological innovations that reduce the information advantage of local relationship lenders vis-à-vis transaction lenders, such as small business credit-scoring, lead to an increase in collateral requirements in local lending relationships.

In “The Effect of Capital Market Characteristics on the Value of Start-Up Firms” (Journal of Financial Economics, 2004), Roman Inderst and I consider a double-sided moral hazard problem between an entrepreneur and a venture capitalist. The Pareto frontier is strictly concave, implying that there exists a uniquely optimal second-best sharing rule that trades off the costs and benefits of the entrepreneur’s and venture capitalist’s efforts. In practice, however, equity shares are determined by bargaining, implying that the output produced in the venture will generally be lower than under the second-best optimal sharing rule. (Lump-sum transfer payments ameliorate the problem only partly, as it is assumed in the model that the entrepreneur has no wealth.) To close the model, we embed the contracting-cum-bargaining problem in a stationary search market in which the relative scarcity—i.e., the relative demand and supply—of venture capital endogenously determines the venture capitalist’s and entrepreneur’s outside options in the bargaining game, and thus their respective equity shares and the output produced in the joint venture. The relative demand and supply of venture capital, in turn, is endogenous and depends on the profitability of investments, entry costs, and the transparency of the venture capital market. We analyze both the short- and long-run (i.e., after new entry) effects of shifts in the relative demand and supply of venture capital for the pricing, contracting, and overall output created in new ventures, which provides us, *inter alia*, with a stylized picture of the Internet boom and bust periods. The model also makes empirical predictions regarding the effects of changes in investment profitability, entry costs, and capital market transparency on the supply of venture capital, the pre- and post-money valuations in new ventures, the success likelihood of projects, and the overall value created in new ventures.

In “Internal vs. External Financing: An Optimal Contracting Approach” (Journal of Finance, 2003), Roman Inderst and I examine the conditions under which different projects should be optimally combined under one roof, so that corporate headquarters raises external finance on behalf of multiple projects (“centralized borrowing”). The alternative is to have each project raise funds separately on the external capital market as a stand-alone entity (“decentralized borrowing”). We use the incomplete contracts model by Bolton and Scharfstein (1990) as our base model. In this model, the
mechanism allowing firms to raise external finance *ex ante* is the threat by investors to terminate funding at the *interim* stage. Centralized borrowing has both costs and benefits. On the benefit side, corporate headquarters can use excess liquidity from high-cash flow projects to “buy” continuation rights for low-cash flow projects that would otherwise be inefficiently terminated. On the cost side, headquarters may pool cash flows from several projects and self-finance follow-up investments without having to return to the external capital market. This weakens the investors’ termination threat, thus tightening financing constraints *ex ante*. In equilibrium, projects with a high likelihood of high cash flows optimally remain stand-alone firms, as these projects are likely to generate large internal funds allowing headquarters to self-finance follow-up investments. Accordingly, the model provides a theoretical foundation for the “conglomerate discount,” arguing that the discount may be the result of endogenous self-selection by poorly performing projects into conglomerate firms.

**Early Theory Work**

In “*Competitive Search Markets for Durable Goods*” (Economic Theory, 2002), Roman Inderst and I consider a dynamic version of Akerlof’s lemons problem in which buyers and sellers must engage in search, and in which goods of different qualities are traded in different submarkets and at different prices. In equilibrium, high-quality goods are traded at a higher price but must circulate longer than low-quality goods, which implies that the time that goods must circulate until they are sold serves as a sorting device.

In “*The First-Best Sharing Rule in the Continuous-Time Principal-Agent Problem with Exponential Utility*” (Journal of Economic Theory, 1998), I derive the optimal risk-sharing contract in the Holmström-Milgrom (1987) continuous-time principal-agent model with exponential utility. Like the second-best optimal sharing rule under moral hazard derived by Holmström and Milgrom, the first-best optimal risk-sharing contract is linear in aggregate output.

In “*Asymptotic Efficiency in Dynamic Principal-Agent Problems*” (Journal of Economic Theory, 2000), I show that for linear sharing rules to be optimal in the Holmström-Milgrom model, it must be the case that the agent chooses his effort *continuously*. In contrast, if the agent can change his effort only in (arbitrarily small) discrete time intervals, then a solution no longer exists. In fact, the first-best outcome can then be
approached asymptotically with a sequence of Mirrlees-type step function contracts that punish the agent increasingly harder for increasingly lower outcomes.