

RESEARCH STATEMENT

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I am an applied microeconomist whose research lies at the intersection of Industrial Organization and Organizational Economics. A main focus of my work has been on the determinants and consequences of vertical integration and outsourcing. I have also made contributions in several other areas, including consumer responses to changes in service quality, the relationship between corporate governance and productivity growth, and the gaming of public disclosure programs. My research to date has been empirical, using econometric techniques to test theoretical relationships that have been proposed in the literature. The main contributions of my work have been to identify contexts that allow for well-identified econometric tests of the proposed theories and to provide evidence on these theories. Much of my work uses the airline industry as an empirical setting, but all of it has implications beyond this particular context. The large volume and the richness of the airline data that are available have made this industry a particularly fruitful setting for my research.

My first stream of research investigates organizational design and performance. This stream includes my work with Mara Lederman (University of Toronto) on the determinants of vertical integration decisions in the airline industry and on the effects of these decisions on firm performance. It further includes two papers that examine outsourcing arrangements. The first of these papers (also joint with Mara Lederman) studies the relationship between the adoption of a new technology and the use of revenue-sharing and fixed-fee contracts in outsourcing relationships. The second paper (joint with Nora Gordon) studies how public schools may acquire and use information on firm quality in choosing among private providers of outsourced services. Lastly, in joint work with Jens Köke and Joachim Winter, I have investigated the relationship between corporate governance and productivity growth.

My second stream of research examines consumer responses to changes in service quality. This stream includes a paper that uses a quasi-experimental setting to estimate the relationship between competition and consumers' willingness-to-pay for service quality, using flight delays as the empirical application. It also includes a paper that examines how customer complaints are influenced by consumers' expectations.

A third research area I have begun to investigate studies how firms respond to information disclosure requirements. In a joint paper with Mara Lederman and Trevor Tombe, I have studied how firms which are subject to disclosure regulation that is based on passing a specific threshold engage in efforts to “game” the disclosed information, and how these firms use bonus payments in order to incentivize their employees to participate in such gaming efforts.

In the remainder of this research statement, I describe my work and its contributions in more detail. I conclude by outlining current work in progress.

Why Do Firms Vertically Integrate and What Are the Consequences?

The field of organizational economics owes many of its ideas to the influential work by Oliver Williamson, for which he received the Nobel Memorial Prize in Economics in 2009. Williamson is fundamentally interested in explaining why some economic transactions take place inside firms while others are organized by market exchange. He argues that integration may be a more efficient way to organize production when contracts are incomplete and parties cannot easily switch trading partners (conditions which lead to what Williamson calls “transaction costs”). Williamson identifies two main sources of transaction costs: asset specificity and the need for *ex post* adaptation. His work has inspired a sizeable empirical literature that has demonstrated a robust relationship between asset specificity and vertical integration. However, the complementary hypothesis involving the relationship between *ex post* adaptation and vertical integration has remained largely unexplored.

In our work titled “**Adaptation and Vertical Integration in the Airline Industry**”, published in the *American Economic Review* (2009), Mara Lederman and I provide the first large-scale empirical test of this hypothesis. We overcome the challenge of identifying an empirical setting in which (i) the need for *ex post* adaptation can be measured well, and (ii) there is observable variation in vertical integration. We study vertical integration decisions between the major U.S. network airlines and their regional airline partners. In this industry, all flights on small planes (turbo-props or regional jets) are operated by regional airlines, some of which are owned by a major carrier while others are independently owned. Given that airline operations are both highly complex and influenced by factors outside the airline’s control (such as weather), contracts between majors and regionals will be incomplete and the likelihood that the contracting partners will need to engage in *ex post* adaptation is high. Moreover, because majors care about optimizing the performance of their overall network but regionals do not, the potential for haggling when *ex post* adaptation is required is substantial. This combination suggests that transaction costs may be significant and there may be a role for vertical integration to economize on these costs. To test this, we exploit the fact that both the frequency and costliness of *ex post* adaptation decisions vary systematically with

exogenous and observable market characteristics, namely weather and hub location. The paper demonstrates that firms are more likely to integrate transactions which require more frequent and more costly adaptation decisions (i.e., flights between cities with worse weather patterns and with hub locations). Furthermore, because we observe airlines that use both owned and independent regional partners, we are able to use airline dummies to control for unobservable factors that affect a particular firm's relative returns to vertical integration. We also explicitly estimate an airline's decision to serve a particular route with any type of regional as a function of exogenous variables. Finally, our paper shows how network considerations can affect organizational decisions.

Building on this work, in **“Does Vertical Integration Affect Firm Performance? Evidence from the Airline Industry”**, published in the *RAND Journal of Economics* (2010), Mara Lederman and I explore the consequences of vertical integration for firm performance. This question is, of course, of deep interest to anyone studying vertical integration, both in economics and in strategic management. However, this is another question which had remained largely untested empirically prior to our work, due to the challenges of finding a convincing econometric identification strategy. One problem is, again, measurement. In order to provide convincing evidence, one needs to obtain data on performance measures for similar transactions that are organized differently. The second problem is that vertical integration decisions are endogenous to firm performance and one needs to find appropriate instrumental variables for vertical integration in order to address this endogeneity problem. In our paper, we overcome both of these problems. Using data on flight delays and cancellations for all flights by major U.S. airlines for one year, the paper demonstrates that integrated firms have better operational performance compared to non-integrated firms carrying out virtually identical transactions. Moreover, the paper shows that this performance advantage increases on days with worse weather, when the need for adaptation decisions is greater, thus providing empirical evidence that integrated firms are, in fact, better at carrying out adaptation decisions than non-integrated firms (i.e., the integration patterns uncovered in our paper in the *AER* can be interpreted as based on rational decision-making by the firms' managers).

In a related paper, **“The Role of Regional Airlines in the U.S. Airline Industry”**, published in *Advances in Airline Economics: Volume II*, edited by Darin Lee (2007), Mara Lederman and I provide an overview of the evolution of this increasingly important segment of the airline industry, and trace it back to the industry's history before its deregulation. This piece offers background information on the relationship between regional airlines and the traditional major airlines and describes current and future trends in the industry.

Technology Adoption And Outsourcing Arrangements

In “**Contract Form and Technology Adoption in a Network Industry**” (joint with Mara Lederman and forthcoming in the *Journal of Law, Economics, & Organization*), we investigate the relationship between technology adoption and the types of contracts that are used to govern outsourcing relationships. The work is motivated by a striking empirical observation: Around the same time as the airline industry adopted a new technology, the Regional Jet, outsourcing contracts with regional airlines which operate these Regional Jets switched from being almost entirely revenue-sharing to being almost entirely fixed-fee. The paper’s novel contribution is that it demonstrates that – in addition to the standard incentives-insurance tradeoff between fixed-fee and revenue-sharing contracts which has been explored in the literature in much detail – a second tradeoff arises in network industries as a result of externalities between the part of a firm’s network that is kept in-house and the part of the network which is outsourced. We present evidence that the new aircraft technology changed the set of flights that airlines subcontracted to their regional partners and did so in a way that favored the use of fixed price rather than revenue sharing contracts. In particular, our results are consistent with the hypothesis that the new flights being subcontracted had characteristics that would have led to significant haggling costs under route-level revenue sharing.

(How) Do Public Schools Use Information in Making Outsourcing Decisions?

In “**When Educators are the Learners: Private Contracting by Public Schools**” (joint with Nora Gordon), we study the outsourcing behavior of public schools. Many public entities outsource some of their tasks to private firms, often with the intention of improving efficiency and reducing costs. However, government services are often inherently complex tasks. When such tasks are outsourced, an obvious question is how to evaluate the quality of contractors who offer to provide the service, especially when there is not already an existing private market for such services. Nora Gordon and I identify an empirical setting – the market for “Comprehensive School Reform” (CSR) services – which offers a unique opportunity to study the behavior of public schools that are confronted with this question. In this setting, schools received the opportunity to purchase CSR services (paid for by federal grants) at different points in time, but each school could buy the service only once. We examine whether schools in later years appear to have learned from the experiences of other schools in the past. We focus, in particular, on the potential for social learning from likely peers, such as other schools in the same or in neighboring districts. We find strong evidence that schools that are located in the same districts tend to contract with the same providers, regardless of past performance. In addition, our point estimates suggests school administrators may use information from their peers to choose the plans they perceive to have performed best in

the past. However, despite choosing a market with an unusually comprehensive data source on contracts between public schools and private firms, our statistical power is weak and we cannot reject the absence of such social learning. The paper concludes by outlining future experimental directions for related research.

Corporate Governance and Productivity Growth

In **“Product Market Competition, Corporate Governance and Firm Performance: Evidence from Germany”**, joint with Jens Köke and Joachim Winter and published in *Research in Economics* (2002), we examine the relationship between product market competition and corporate governance and their impact on productivity growth, using data on German manufacturing firms. The paper demonstrates that both product market competition and concentrated ownership contribute positively to productivity growth. Moreover, in Germany, product market competition and corporate governance act as complements: The positive effect of competition is enhanced by the presence of a strong ultimate owner. This is in contrast to the findings of a previous study for the U.K., where product market competition was found to act as a substitute for corporate governance. The paper explains that these results are likely due to the very different institutional arrangements in so-called “bank-based” continental European countries and “market-based” Anglo-Saxon countries. This paper is the first to empirically examine the relationship between product market competition and corporate governance in a bank-based continental European economy, and thus the first to uncover these distinct empirical patterns. The paper is also novel in its use of a proprietary database which (i) includes non-listed private corporations and thus provides much better coverage of the economy than typical studies involving only publicly-listed corporations, and (ii) allows us to trace out cross-ownership patterns and determine the ultimate owner(s) of each firm, thus providing more accurate measures of corporate governance than previously available in the literature.

How Do Consumers Respond to Changes in Service Quality?

My work in this area includes two research papers that investigate how airline passengers respond to changes in service quality. In **“The Effect of Air Traffic Delays on Airline Prices”**, published in the *International Journal of Industrial Organization* (2008), I investigate how a reduction in service quality (in the form of longer flight delays) affects prices and how this effect varies with competition on the route. Theoretically, the relationship between competition and service quality is ambiguous. Empirically, the challenge in estimating these effects is that service quality is endogenous to price. In particular, when we observe that long flight delays are correlated with lower ticket prices, this may either be due to the fact that passengers are willing to pay less on

routes with longer delays, or it may be the case that airlines charge less and put less effort into being on time on routes with lower demand. In order to overcome this endogeneity problem, I exploit an exogenous shock to flight delays from a policy change at LaGuardia Airport in New York City. I find that prices fall in response to a decrease in service quality, and that this effect is much stronger in competitive markets than in non-competitive markets.

The second paper in this line of research, “**The Effect of Service Quality and Expectations on Customer Complaints**”, published in the *Journal of Industrial Economics* (2008), studies how actual service quality and expected service quality affect customer complaints. This paper also uses the airline industry as its empirical setting. The U.S. Bureau of Transportation Statistics collects unique data which include not only information on customer complaints by complaint category (e.g. flight disruptions, mishandled baggage) but also information on past and current performance of each airline in each of these categories. I estimate an expected level of service quality for each airline in each period based on the airline’s past performance. Using these estimates, I test how this expected value and the actual level of service quality affect the number of customer complaints. I find that customers complain more frequently when the actual quality is worse and that, controlling for the actual level of quality, passengers complain more often when the expected level of quality is higher. These results highlight the important role of expectations in determining customer complaints. They also provide insights on how to interpret customer feedback in settings in which information on past quality is not available to consumers, such as online marketplaces. In those cases, buyers’ motivations for giving feedback about sellers may be driven by a mix of intentions to provide a signal to future buyers and of behavioral motivations.

Gaming of Public Disclosure Programs

Many quality disclosure programs provide consumers with information that is based on whether a product meets a particular threshold. This creates the potential for “gaming” as firms have incentives to improve the quality of specifically those products that can easily be brought above the threshold. In “**Do Firms Game Quality Ratings? Evidence from Mandatory Disclosure of Airline On-Time Performance?**”, Mara Lederman, Trevor Tombe and I investigate this type of behavior in the context of government-mandated disclosure of airline on-time performance. While this program collects data on the actual minutes of delay incurred, it ranks airlines based only on the fraction of their flights that arrive 15 or more minutes late. This creates the incentive for airlines to selectively reduce delays on flights they expect to arrive with about 15 minutes of delay. We estimate the extent to which airlines engage in this type of gaming and, in particular, whether the occurrence of such gaming depends on whether employees are explicitly incentivized based on the airline’s performance in the program. We find little

evidence of gaming by airlines that have no incentive programs in place or by airlines that have implemented incentive programs with targets that are unrealistically hard to achieve. On the other hand, we find strong evidence of gaming by airlines that have incentive programs with a target level of performance that can realistically be achieved. Our results highlight that quality disclosure programs – when combined with financial incentives for employees – can lead to significant distortions in the allocation of employee effort. This has important implications for major public policy initiatives that are being considered, such as linking teacher pay to the percentage of students that pass a certain threshold. Compared to the existing education literature, the setting we study offers the advantage of allowing us to compare very similar services that are repeatedly produced within short periods of time, thus letting us create convincing counterfactuals for the outcomes that would be observed absent the disclosure regulation. This research is supported by **NSF Award #SES-1124154 (PI: Silke J. Forbes)**.

Current Work in Progress

My current work in progress includes two projects that study insurance markets. The first project with the working title “**Switching Costs in Health Insurance**” (joint with Gordon Dahl), will exploit a change in the health insurance offerings of a large employer to estimate individuals’ willingness-to-pay for being able to keep their current primary care doctor. Beginning in January 2011, employees who were with one of the health insurance providers were given the option of choosing a lower premium in exchange for accepting a more limited network of primary care physicians, while staying with the same insurance plan. All other aspects of insurance coverage would remain the same. Alternatively, individuals could stay with the default option of paying a higher premium and facing no change in the network of primary care doctors. For individuals whose doctors were covered under both plans, coverage and insurance were identical under both options so that the cheaper option strictly dominated the more expensive option. We can use the observed choices of these individuals to estimate the propensity not to switch health plans due to inattention. Individuals whose existing doctors were *not* covered under the cheaper option had to decide whether they would prefer to pay more to keep their current doctor. This setup will allow us to identify the costs that individuals associate with having to switch doctors separately from switching costs that are related to inattention. Existing work in this area often relies on identification based on individuals who choose among *different* insurance plans. In our setting, the only variation in the options that individuals face comes from the network of available doctors and the insurance premium.

The second project, “**Rent Extraction by Insurance Brokers: Evidence from Brazilian Car Insurance**” (joint with Daniel Ferreira Lima) is one of the first to our knowledge to provide empirical evidence on the pricing behavior of insurance brokers,

using a unique database on car insurance in Brazil. In Brazil, car insurance companies are forbidden from selling directly to consumers and must instead sell their policies through independent brokers. These brokers, in turn, are required to sell policies on behalf of all insurance firms. Using information on insurance premia and brokerage fees, as well as on individual characteristics and claims data, we find that while insurance premia are positively correlated with accident risk, brokerage fees are *inversely* related to accident risk. We take this as evidence that brokers price discriminate on different dimensions than the insurance companies which are setting the premiums. We also find evidence that brokers are extracting rents from low-risk consumers. We explore the implications of our findings for vertical contracts in this industry.

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