The George Stigler Center for the Study of the Economy and the State

The Center for the Study of the Economy and the State was founded by George Stigler at the University of Chicago in 1977. It has from the beginning been a joint enterprise of economists and legal scholars at the Graduate School of Business, Department of Economics and Law School of the University of Chicago. The Center was renamed in George Stigler's memory after his death in 1991.

The Stigler Center is dedicated to the study of the effects of political life on economic life and the reciprocal effects of economic life on political life. That is not a very restrictive program, since there are few areas of our lives where neither economics nor the state intrudes. To carry out its mission, the Stigler Center supports research of faculty at the University of Chicago and of visitors from other academic institutions. The Center publishes a Working Paper series, and it promotes the dissemination of this research to a wider audience via conferences and lectures.

The Stigler Center contributes importantly to the continuity and growth of 'Chicago Economics,' which is known worldwide for two attributes:

- A tough-minded professional style that views economic theory not as an end but as a tool to assist in understanding the real world
- A lively appreciation for the working of private markets

George J. Stigler

George Stigler joined the faculty of the Graduate School of Business and the Department of Economics at the University of Chicago in 1958. This event and the arrival two years later of Merton Miller is widely recognized as establishing the Business School as a world leader in academic research and making it a full partner in an extraordinarily fruitful cooperative research enterprise with the University's Department of Economics and Law School.

Stigler was one of the great economists of the 20th century. He made seminal contributions to the economic theory of information and oligopoly and to the economic analysis of government regulation and the public sector. Stigler received the profession's highest honors including the presidency of the American Economic Association and the Nobel Memorial Prize in Economic Science. His 1982 Nobel Prize was the first awarded to an economist whose primary appointment was in a Business School.

More information may be found at the Stigler Center's website:
http://gsbwww.uchicago.edu/research/cses/

INTRODUCTION

Sam Peltzman, Director

The 1999/2000 Academic year was one of achievement for the Stigler Center's research community. But it was also one of loss. On the same day, June 3, 2000, the Stigler Center lost two friends and supporters – Merton Miller and William Simon.

Mert Miller was best known to the outside world as a Nobel Laureate in Economics and a founder of Financial Economics. He was also a bedrock of Chicago Economics and an enthusiastic supporter of the Stigler Center's commitment to that unique brand of economic analysis. Mert served on the Stigler Center's Executive Committee until his death.

Bill Simon, as president of the John Olin Foundation, was instrumental in establishing the Olin Visitors program at the Center and encouraging its continued development. The Olin Visitors program brings researchers from other academic institutions to Chicago where they become part of our research community for the period of their visit. Without Bill's vision and commitment this program could not have achieved its current great success.

All of us will miss Mert and Bill's wisdom and encouragement. Both were true friends of the Center and of Chicago Economics.

On a happier note, the Stigler Center was fortunate that Randy Kroszner accepted the position of Associate Director. Randy has been a valuable member of the Center's research community for several years. Now, he has begun to contribute to the administration of the Center as well.

This report summarizes the scholarship of 16 members of the University of Chicago faculty and 5 visitors. No one topic, or even a small group of them, dominates this report. However, there is a substantial representation of work in the economic analysis of the public sector (Becker, Mulligan, Kroszner, Gawande), the regulation and development of financial markets (Kashyap, Kroszner, Rajan and Zingales), corporate governance and law (Kaplan, Vishny, Rajan and Zingales) and the economics of health and health policy (Moore, Murphy, and Philipson).

There is a substantial interplay between much of this research and contemporary developments and policy issues. For example, our research community's interest in health issues is stimulated by the increasing importance of the health sector in the economy and the correspondingly increased public policy role in this sector. Both of these developments are, in turn, rooted in some striking advances in technology. (Murphy documents the enormous magnitude of some of these advances)

These advances have contributed to an ongoing increase in longevity. Because the elderly generate substantial demand for health care, these advances have produced higher spending on health. Under current arrangements, much of this increased spending – and collaterally increased spending on the care of the elderly – falls on the public sector. Thus issues like the financing of retirement (Mulligan) and long-term care of the elderly (Philipson) assume greater importance.

Sometimes these long-term trends in health and longevity interact in unexpected ways. Mulligan's work shows that most social security systems include regulatory provisions designed to encourage retirement and thus raise the demand for younger workers. These reflected a political economy whereby the regulatory provisions could induce the young to support transfers to the elderly. The graying of the population has strained that confluence of interests. It is one reason that social security reform proposals now receive serious attention.

Another effect of longevity has been increased concern about the financing of long term care. But Philipson questions the underlying assumption that increased longevity raises spending on long-term care. He points out that the opposite may well occur, because increased longevity is also being accompanied by better health. This makes the elderly better able to care for themselves both as individuals and couples.

The ongoing technology-led economic expansion has undoubtedly stimulated research on issues of corporate governance and law. The essential questions here are about what kinds of laws and institutions are most conducive to economic growth. The work on the effect of legal protection of investors (Vishny), the division of contractual rights between venture capitalists and their clients (Kaplan), the impact of legal systems on firm size and the interaction between the development of financial markets and economic growth (Rajan and Zingales) all grapples with that question.

This research has made it clear that institutions matter perhaps more than most economists previously thought. It is not simply that security of property assists economic development. The details – e.g., precisely what does a controlling owner owe minority shareholders –also matter. What is less clear is how malleable these institutions are and how adaptable are the successful innovations, like venture capital in the U. S., to different legal environments. These issues are beginning to be addressed by our research community.

Financial markets everywhere are in the midst of substantial change. In general, regulatory barriers to the flow of financial resources between countries and economic sectors are declining. For example, in the U. S. the long-standing legal separation of commercial banking from other financial markets was repealed last year. In Japan a highly regulated and protected banking system is going through a crisis that will ultimately produce a less regulated system. Kroszner and Kashyap, respectively, discuss these developments. Their work shows that in both cases technology provided an important stimulus to regulatory change by providing easier access to competitive alternatives for customers of the regulated institutions.

That interaction between technology and regulation in financial markets was also the subject of a conference sponsored by the Stigler Center. "The Future of Finance: Globalization, the Internet, and Regulatory Reform" was held at the University of Chicago Gleacher Center on April 28, 2000. The conference brought together international business leaders, senior regulators from the Federal Reserve and International Monetary Fund, and University of Chicago faculty to assess the opportunities and risks posed by deregulation and technological innovation in financial services. The conference was simultaneously carried via 2-way broadcast to an audience at the Getulio Vargas Foundation in Sao Paolo, Brazil. Nothing perhaps better illustrates the pervasiveness of the change in financial markets than the international nature of this conference.

Our associate director, Randy Kroszner, was instrumental in organizing this conference. Claudio Furtado of the Getulio Vargas Foundation arranged the broadcast to Brazil. I would also like to thank the Graduate School of Business' Executive Education Office and Office of Alumni Affairs for their help in connection with this conference.

Finally, I want to thank Victoria Ryberg for her able administration of the Center's activities.

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UNIVERSITY OF CHICAGO FACULTY

Gary Becker

Casey Mulligan and I continued our work on The Growth of Government. The project tries to explain the growth of government through competition among interest groups. An important aspect of the study is to study the interaction of regulation and government spending. Are they substitutes for one another, or are they complements in serving relevant interest groups? Our preliminary results indicate that regulation over most of the period increased as federal government spending increased. Thus our tentative conclusion is that the main factor explaining the growth of government is the increased political power of groups that received subsidies. In particular, we are concentrating on the power of the elderly since increased entitlements to this group explains so much of the increase in federal spending.

Mulligan and I are also working on the links between government spending and tax revenue by looking into competition among interest groups. We work out various theoretical implications. For example, an increase in efficiency of the taxes used would increase government spending, and might even increase the total inefficiency associated with taxes! The reason for the expansion in government spending is that taxpayers fight less hard to resist higher taxes when the cost per dollar of taxes paid is lower because the tax system is more efficient.

We test this and other implications of the analysis by looking at various types of evidence, including the growth in VAT taxes over time and in various countries, the effect on government spending by all producing countries when the price of oil rises and falls, and the effects of other types of flatter taxes on government spending. On the whole, empirical evidence is generally consistent with the implications of this model. We have submitted a paper based on this work to an economics journal.

Kevin Murphy, Ivan Werning, and I completed a study on the relation between status, inequality, and risk-taking. We use this analysis to consider the inequality in the distribution of income, the role of status in choices, and the links between entrepreneurship and other risky activities, and the drive for prestige and recognition.

A version of this work has been published as a Stigler Center Discussion paper.

Robert Gertner

Judith Chevalier and I have begun a study of pharmaceutical pricing. We are studying pricing and promotion by competing patented drugs in the same therapeutic category. Several characteristics of these markets make such a study interesting. First, patent protection and the lengthy research and development process limit the number of drugs competing at any time. This also makes timing of subsequent entry largely exogenous, and allows us to study first-mover advantages and strategies. In addition, these markets are characterized by significant scientifically based and observable vertical and horizontal differentiation. Different chemicals work differently for varying conditions, have different side effects and other characteristics that make one chemical preferable for some patients and another chemical for other patients. Vertical differentiation is also present if one chemical is more effective, has better dosing or better delivery. These differences change over time as more scientific studies are published. We have collected and coded the published medical studies for the pharmaceuticals in several therapeutic categories. We are in the process of collecting price and marketing data. We will then study how first-mover advantages, and the evolution of vertical and horizontal differentiation affects price competition and marketing expenditures.

Steven N. Kaplan

In the last year, I have worked on the following projects.

Financial Contracting Theory Meets the Real World. Per Stromberg and I completed a study that analyzes the structure of venture capital financings. There is a large academic literature in security design, capital structure, and contracting in general. The papers in this literature often begin with a situation in which a principal negotiates with an agent over the financing of a project or company. These theoretical papers typically make a number of different assumptions and predictions concerning these negotiations. These assumptions concern how easy it is to observe the agent's actions and write contracts based on these actions, the ability to renegotiate these contracts and the nature of information and uncertainty.

Despite the large volume of theory, there is relatively little empirical work that compares the characteristics of real world financial contracts to their counterparts in financial contracting theory. In this paper, we attempt to inform theory by conducting a detailed study of actual contracts between venture capitalists and entrepreneurs. Venture capitalists (VCs) are real world entities that most closely approximate the investors of theory. VCs have strong incentives to maximize value, but, at the same time, they receive few or no private benefits of control.

The distinguishing characteristic of VC financings is that they allow VCs to separately allocate cash flow rights, voting rights, board rights, liquidation rights, and other control rights. We explicitly measure and report the allocation of these rights. This allocation has the following characteristics in our sample: (1) While convertible securities are used most frequently, VCs also implement a similar allocation of rights using combinations of multiple classes of common stock and straight preferred stock. (2) Cash flow rights, voting rights, control rights, and future financings are frequently contingent on observable measures of financial and non-financial performance. (3) If the company performs poorly, the VCs obtain full control. As company performance improves, the entrepreneur retains / obtains more control rights. If the company performs very well, the VCs retain their cash flow rights, but relinquish most of their control and liquidation rights. The entrepreneur's cash flow rights also increase with firm performance. (4) It is common for VCs to include non-compete and vesting provisions aimed at mitigating the potential hold-up problem between the entrepreneur and the investor.

We have submitted the latest version of this paper to the Review of Economic Studies. We also have been asked to produce a shorter version of this paper (and the one that follows) for the American Economic Association meetings in January. The shorter version will be published in the Papers and Proceedings issue of the American Economic Review.

What do VC firms really do? Per Strömberg and I have begun to use the same data set to examine what VCs actually do and how VCs add value to their investments (if they do at all). Gorman and Sahlman (1989), Hellman and Puri (1998), and Lerner (1995) provide some evidence on these topics although much of it is limited or indirect. Strömberg and I will add to this literature by comparing the portfolio company business plan to the internal investment analysis by the VC firms (at the time of the financings) and subsequent performance. In this paper, we expect to detail the actions taken by the VCs – screening and monitoring – and the impact of those actions.

Do Bidders Overpay? Extracting Stock Price Information from Takeover Battles. In this paper, Pekka Hietala, David Robinson and I analyze the amount of information that can be extracted from stock prices around takeover contests. This work is motivated by numerous studies showing that bidders tend to overpay for targets in takeover contests. In many of these studies the gains to the target minus the bidder's overpayment are taken to be the market's assessment of the net value created by the takeover. The first part of the paper shows that it is not possible in general to use target and bidder stock price movements to infer the market's estimates of synergies, bidder overpayment, and changes in bidder and target values. In two generic cases, however, we show that it is possible to use bidder and target stock prices to obtain market estimates of overpayment.

In the second part of the paper, we illustrate one of these two generic cases through a clinical study of the takeover contest for Paramount Communications. We find that the market estimated that Viacom, the eventual "winner" of the takeover battle, overpaid by approximately $1.4 billion when it agreed to purchase Paramount in a $9.2 billion acquisition in February 1994. We also find that the market believed that QVC, the eventual "loser" of the battle, had substantially larger synergies (on the order of $1 billion more) with Paramount than Viacom. Viacom prevailed because of its willingness to overpay by much more than QVC. This overpayment occurred despite the fact that Sumner Redstone, the CEO of Viacom, owned roughly 2/3 of Viacom. We view the results for Paramount and Viacom as strongly consistent with Roll's Hubris hypothesis as well as the results in Morck, Shleifer and Vishny (1990).

A revised version of this paper will be presented at the American Finance Association meetings in January.

Anil Kashyap

This year I worked on two projects.

Judy Chevalier, Peter Rossi and I completed a first draft of our paper on supermarket pricing ("Why Don't Prices Rise During Peak Demand Periods? Evidence from Scanner Data"). We examine the retail and wholesale prices of a large supermarket chain in Chicago over seven and one-half years. Our main result is that prices tend to fall during the seasonal demand peak. This is surprising because textbook economic theory would suggest that prices should rise when demand rises (or, in a perfectly competitive market with constant returns to scale, stay the same).

To explain this anomaly some part of the textbook model of pricing must be incorrect in our setting. We explore explanations based on theories of imperfect competition. With imperfect competition, the markup of prices over costs could be fluctuating. The challenge in this case is to determine whether movements in manufacturer prices or movements in retailer margins lead to the price declines at demand peaks and then to determine whether the pattern of price and markup movements that we observe conform to various theories of why the markup might move over the demand cycle.

We find that changes in retail margins account for many of the price changes. This is true for goods with demand that peaks at a time when aggregate demand for the supermarket is unusually high, such as snack crackers at Christmas. More surprisingly, this is also true for goods with demand that peaks at a time when aggregate demand at the supermarket is not particularly high (such as tuna at Lent and oatmeal in the winter). This second fact makes it unlikely that these price declines are due to breakdowns in tacit collusion amongst retailers. Such breakdowns would be likely to occur when aggregate demand is high, but not when the demand for a specific product is high.

The most compelling explanation for our findings is based on the role of advertising in retail markets. If customers are imperfectly informed about prices, and the cost of searching across stores is significant, then advertising can be a useful tool for retailers. Assuming there are costs to advertising prices (as is clearly the case for the supermarket industry where only a fraction of total goods are advertised each week), stores will compete through advertising certain goods. In particular it pays to advertise and commit to a low price for the goods that people are most interested in buying. Thus, the stores offer deals on turkeys at Thanksgiving, Tuna at Lent and so on.

The fact that we find pervasive evidence of this type of pricing is important in several respects. First, the same conditions which describe the buyer-seller relationship in supermarkets (a multi-product interaction with noticeable search costs) holds in many other settings, suggesting that the same pricing pattern may hold more generally. In fact, the failure of prices to rise when spending is high has been documented in many studies.

Moreover, the failure of prices to rise in these cases is likely related to understanding how Central Bank policies affect the economy. For instance, when the Federal Reserve increases the money supply people may opt to use the extra money to increase their spending. If prices were to rise immediately then the spending would make no difference in the real quantity of goods sold – the price increase would leave people with the same purchasing power so that the actual amount of goods sold would be the same as if the Fed had not acted. If prices are sticky, and do not rise once the spending commences, then the Fed action can be important. Thus, understanding why price adjustment is slow is important for understanding how monetary policy operates.

It is unclear whether the advertising explanation for seasonal price movements would also operate over business cycles. But the usual stories for why prices do not rise during cyclical expansions do make predictions about how supermarket prices should move. Basically these theories suggest that price rigidity should be most pronounced at times of high aggregate purchases (which are like business cycle booms). The fact that this is not enough to explain our findings also casts some doubt on the explanatory power of these models.

I also completed a first draft of a book (which is written with Takeo Hoshi of the University of California at San Diego) on the Japanese financial system. We study the evolution of the financial system in Japan from the Meiji Restoration until the present. We argue that it is helpful to break this period up into 5 parts.

The first regime ranges from the Restoration until Japan begins its preparations for World War II. We show that during this period the Japanese financial system was more like the modern U.S. system than the post-war system in Japan. In particular, firms got most of their funding through capital markets rather than banks. The banks were an important part of the system, but hardly dominated it.

This all changed as the economy became militarized. Regulations were passed which strongly impaired the rights of shareholders (e.g. limits on dividend payments) so that savers became much less interested in making equity investments. The purpose of these regulations was to make sure that the government could direct the flow of credit to support the war effort. The banks were put in charge of allocating the credit and gained prominence during this period.

Importantly, the banks also played a central role in the restructuring of the economy that came at the end of the war. The restructuring was needed because once the war ended the Allies would not allow the Japanese government to repay the war debts, and this left many companies bankrupt. Banks took the lead in establishing business plans for the companies and acquired a great deal of expertise about these companies.

The third regime came after this restructuring and represented a continuation of the system left over from the war. Savings options for individuals were limited so as to steer their savings to the banks. The banks were then encouraged through further regulation to recycle the money, mostly to large industrial companies. The system, although cumbersome, worked decently during the high growth period from the mid-1950s to the early 1970s when Japan was catching up to the rest of the world. However, by the end of this time the economy had become the second largest in the world, while the financial system was relatively underdeveloped.

The fourth regime was a transitional period in which the system was slowly deregulated. Market financing options were permitted for the firms, but savings options were still relatively restricted. So corporations moved to substitute bond financing for bank financing, while individual wealth was still very deposit intensive – the banks ended up buying many of the bonds. The banks unfortunately did not see their operating restrictions liberalized, which left them in an awkward position: They were losing their blue-chip borrowers to the markets, but were not allowed to pursue them by offering new products and services.

This led the banks to search for new borrowers with whom they were less familiar. The result was an increase in lending to smaller firms and to the real estate sector. Hence, when property prices collapsed in the 1990s the banks were more exposed than ever to land prices. Thus, we argue that much of the recent banking crisis in Japan can be traced to the mismanaged financial deregulation that allowed borrowers to shift away from bank financing, but pushed savers to continue to use banks, and stopped banks from diversifying.

This fourth regime will end once the so-called Big Bang deregulation program is completed in March of 2001. At that point savers options will be fully liberalized, so the bank advantages in collecting funds will be gone. But, banks will also be able to greatly expand their business lines, including moving into the insurance and securities underwriting businesses.

We believe that it is too early to tell for sure what the fifth regime (the Post Big Bang system) will look like. But, all indicators point to a re-establishment of a system much more like the pre-war system than any of the subsequent regimes. The largest corporations have already found their way to the markets, and signs of shareholder activism are beginning to appear (e.g. the growth of hostile takeovers and the emergence of the venture capital industry).

Coincident with the shift back towards the markets we forecast a massive decline in the size of the banking industry. We believe that it is impossible for the Japanese banks to remain the largest in the world while being among the least profitable. To engage in traditional banking they are much bigger than is necessary and that is part of the reason why profitability has been so low. Downsizing would improve profitability if they opt to remain focused on basic deposit-taking and loan-making. Alternatively they may use their new powers to move into new businesses where their size might help. But, here we argue that they are starting from so far behind their main international rivals that catching up is very unlikely – rather this is more likely to be a recipe for trouble as they squander large amounts of resources in a futile attempt to make up a deficit in skills that has accumulated over decades. Seeing how this is resolved will certainly be interesting to watch!

Randall Kroszner

Thomas Stratmann and I continued our exploration of how competition among interest groups shapes the committee structure of Congress in "Congressional Committees as Reputation-Building Mechanisms: Repeat PAC Giving and Seniority on the House Banking Committee" (*Business and Politics*, forthcoming). Given anti-bribery statutes, interest groups cannot make enforceable agreements with legislators to assure their support. A system of specialized, standing committees, however, can provide a second-best solution in the PAC-legislator exchange market, since this structure facilitates repeated interactions and the development of reputations by both PACs and committee members. Using data on PAC contributions by rival financial services interests, we find that legislators appear to develop reputations over time. In addition, the level of PAC financial contributions rises as a legislator's reputation becomes more highly developed. We also consider broader implications of this approach for analyzing the consequences of term limits, corruption, and party strength.

The focus of the rivalry among the financial services interests has been the Glass-Steagall Act of 1933, which separated commercial banking from other activities. After more than a decade of intense lobbying and debate, Congress passed the Gramm-Leach-Bliley Financial Modernization Act in late 1999. This Act fundamentally changes financial institution regulation in the U.S. by allowing much greater competition among investment banks, insurance companies, and commercial banks. In "The Economics and Politics of Financial Modernization" (Federal Reserve Bank of New York's *Economic Policy Review*, forthcoming), I analyze the technological and economic shocks that disturbed the long-standing political-economy equilibrium supporting the Glass-Steagall barriers. I also analyze one important barrier that was not fully eliminated, namely restrictions on bank ownership and control of commercial enterprises, in "The Legacy of the

Separation of Banking and Commerce Continues in Gramm-Leach-Bliley" (Federal Reserve Bank of Minneapolis' *The Region*, June 2000).

Despite these restrictions, I find that commercial bankers still have a role in the governance of commercial enterprises in the U.S. In "Bankers on Boards: Monitoring, Conflicts of Interest, and Lender Liability" (*Journal of Financial Economics*, forthcoming), Philip Strahan and I document that approximately one-third of large U.S. corporations have a commercial banker on their boards, although this proportion is smaller than in Germany and Japan where banks do not face similar restrictions. Banks in the U.S., unlike those in most other countries, face the additional burden of "lender liability" that imposes high potential costs on banks involved with client firms that experience distress. Our data are consistent with bankers being sensitive to the potential of lender liability in choosing which firms' boards to join, so firms that could benefit most from having a banker on their boards, e.g., riskier firms, are often less likely to have one. A key rationale for "lender liability" is the concern that bankers, who have the debtor's interest in mind, face a conflict of interest when sitting on the board, since board members have a fiduciary duty to equity holders. Reducing the separation of banking and commerce to allow banks to hold equity in addition to debt, however, would permit a natural market solution to the conflicts of interest problem.

Besides the Gramm-Leach-Bliley Act, the other major bank regulatory reform of the last decade is the 1991 Federal Deposit Insurance Corporation Improvement Act (FDICIA). This Act fundamentally restructured the supervision and regulation system and introduced risk-based deposit insurance. Philip Strahan and I analyze the impact of private interest groups as well as political-institutional factors on the voting patterns on amendments related to FDICIA and its final passage in "Obstacles to Optimal Policy: The Interplay of Politics and Economics in Shaping Bank Supervision and Regulation Reforms" (forthcoming in Frederick S. Mishkin, ed., *Prudential Supervision: What Works and What Doesn't*, University of Chicago Press and NBER). Rivalry of interests within the industry (large versus small banks) and between industries (banks versus insurance) as well as measures of legislator ideology and partisanship play important roles and, hence, should be taken into account in order to implement successful change. A "divide and conquer" strategy with respect to the private interests appears to be effective in enhancing the likelihood of welfare-enhancing regulatory change.

Finally, my paper critically examining the Berle-Means conjecture that the separation of ownership and control of enterprises would grow over time received the Brattle Prize for the best corporate finance paper published in the *Journal of Finance* in 1999 ("Were the Good Old Days that Good? Evolution of Managerial Stock Ownership since the Great Depression," with Clifford Holderness and Dennis Sheehan).

Casey Mulligan

In projects with Gary Becker and Tomas Philipson, I continued to study the links between taxation, regulation, and expenditure by the government. I worked in two broad areas. The first was to build theoretical models that guide the construction of aggregate measures of the extent of regulation and help to distinguish among various explanations for the growth of government. The second was to apply these theoretical results to a particular government program (Social Security).

Most of this work focuses on tax or policy "incidence" – namely, the "winners" and "losers" from government policy – and attempts to integrate previous work on tax incidence with work in diverse areas such as optimal taxation, the economics of regulation, political economy and the empirical literature on public sector policies around the world. Three papers, "Merit Goods and Government Intervention: Public Finance in Reverse," "Accounting for the Growth of Government," and "Retirement-Inducing Policy Wears Many Disguises" deal with the effects – especially the dynamic effects – of government regulation on the poor and on the elderly.

The first systematic application of the theoretical work has been to Social Security and its reform. The results so far are reported in research papers dealing with Social Security and "induced retirement." Some of those (e.g., "Gerontocracy, Retirement, and Social Security") establish the main empirical facts about Social Security, especially its regulatory components. I have looked at the legal underpinnings of Social Security programs around the world and have established regularities in the requirements, contributions, benefits, and restrictions of existing social security programs around the globe. The work on Social Security also includes its own theoretical component. Here I have been exploring the interactions between Social Security and retirement (e.g., "Can Monopoly Unionism Explain Publicly Induced Retirement?"), an evaluation of the competing transfer and regulatory effects of Social Security on the elderly (e.g., "Induced Retirement, Social Security, and the Pyramid Mirage"), and some forecasts for the consequences of Social Security reform (e.g., "Gerontocracy, Retirement, and Social Security").

Some interesting findings have already emerged from the project. We find that Social Security regulations have a substantial impact on the behavior of some people and, as a result, the program's regulatory incidence is of a similar magnitude as its tax incidence, and not always in the same direction. For example, we suggest that Social Security makes the poor worse off because it is compulsory and regulates behavior, and does not make the old as well off as the tax incidence literature would suggest.

Kevin M. Murphy

Over the past year my research has focused on two major topics, the economic value of medical research and the link between status and the distribution of income. The work on the economic value of medical research, joint with Robert Topel, evaluates the economic value of improvements in the health and life expectancy in the U.S. since1970. We also estimate the economic value of prospective reductions in the incidence of disease. In addition, during the past year Gary Becker, Ivan Werning and I have completed a working paper on the link between the demand for social status and the equilibrium distribution of income.

The Economic Return to Medical Research: Our ongoing work is attempting to estimate the economic value of the increases in life expectancy achieved from 1970 to the present and the prospective gains from reducing the death rates from cancer, heart disease, AIDS and other significant diseases. Our results suggest the value of these historical gains and the potential value of further improvements in longevity are enormous. Using prevailing estimates of the economic value of life and a framework we develop for applying these estimates to changes in life expectancy we find that reductions in mortality from 1970 to 1990 were worth an estimated $57 Trillion or about $2.8 Trillion per year over this 20-year period. To put this in perspective this is about ½ of the 1990 GDP on an annual basis. The reduction in the death rate from heart disease alone over this twenty-year period was worth $30 Trillion. The potential gains to further reductions in disease are equally impressive. Eliminating heart disease has a potential value of $48 Trillion while eliminating cancer would be worth an estimated $47 Trillion.

The most important conclusion of our work is that the value of historical as well as prospective improvements in health are likely to be much larger than previously thought. For example, our finding that a cure to cancer is worth roughly $50 Trillion implies that even modest progress - say a five percent reduction in death rates- would be worth about $2.5 Trillion and could justify a second sustained "war" on cancer. To put these potential benefits in perspective, we note that total government funding for all health research was about $16 Billion in 1995 while overall spending on health research was about $30 billion. These numbers would imply doubling research spending from $30 billion to $60 billion per year for an entire decade could be justified on economic grounds even if it were to reduce the death rate from either cancer or heart disease by as little as 1% or 2%.

Does our research say that we should write a "blank check" when it comes to funding medical research? The answer is clearly no. While the gains to improvements in health are large, so too are the potential increases in the costs of care. In fact while improvements in health resulted in an unmeasured gain to U.S. consumers of about $57 trillion over the 1970 to 1990 increases in the costs of care over the period amounted to about $8 trillion making the net improvement in outcomes somewhat less than $50 trillion. While it is unlikely, based on our calculations, that increases in the costs of care will outstrip the gains from improved health or longevity in the aggregate it is certainly possible that some avenues of research could generate greater increases in costs than in benefits. Our current research is focused on exactly this question.

Social Interactions: Over the past several years Gary Becker, Ivan Werning and I have been investigating the impact of social influences on individual consumption behavior and the resulting impact these influences have on the operation of markets. Our latest work looks at social status and how the desire of individuals to improve their social status affects the distribution of income. The effect of social status on the equilibrium distribution of income can be seen in a simple example. Suppose certain goods (i.e. particular neighborhoods or models of cars) convey status and are available in limited supply. Then, as long as these status goods are normal goods (i.e. goods for which demand increases with income) the prices of these goods in the market will tend to increase over time to reflect both their intrinsic consumption value and the value of the status that they confer. In equilibrium the level of income inequality in the population must be sufficiently large so that those who consume these status goods end up with higher utility and higher consumption of non-status goods (as long as status and other goods are complimentary). In fact, under many conditions this theory allows us to predict an "equilibrium" distribution of income to which the economy will tend independent of the underlying level of risk or the underlying level of inequality. To achieve this equilibrium distribution of income individuals may engage in explicit lotteries and/or take significant individual risks (through career choice, entrepreneurial activity or investment decisions). It remains to be seen how well this theory will allow us to explain the observed distributions of income or variation in income distributions across societies or over time.

B. Peter Pashigian

The first project that I worked on during the past academic year is a comprehensive investigation of the used car price index component of the Consumer Price Index (CPI). The accuracy of the CPI has become a matter of public concern, culminating with the recent report of the Boskin Commission. Much of that report focused on the CPI's shortcomings in measuring quality improvement. My project adds evidence on this problem in a specific area accounting for a substantial share of consumer spending.

A comparison of the new and used car price indices reveals an immediate problem: from 1955-1998 the used car price index has increased an average of 4.2 per cent per year between while the new car price index has increased only 2.6 per cent per year. This discrepancy of 2.1 percentage points per year implies that used cars would ultimately become more expensive than new cars. This is clearly implausible. I find that a major reason for the difference is the failure of the

Bureau of Labor Statistics (BLS) to adjust used car prices for quality change until 1987 even though the BLS introduced quality improvement adjustments for new cars in nineteen sixties. Thus for much of this period the CPI was treating the same product differently when it was sold as new than when it was sold as used. It was not until 1987 that the BLS began making quality improvement adjustments to used car prices. I find that this adjustment has sharply reduced the discrepancy between changes in the new and used car CPI components since then.

A second concern with the used car price index is its volatility. Used car prices are among the more volatile items in the CPI. They are more volatile than new car prices, food and shelter but not quite as volatile as energy prices. For example, the standard deviation of annual observations of percentage changes in the yearly average indexes is 2.9 per cent for new cars and 8.2 per cent for used cars over the entire 1955-98 period. I tried to determine whether this difference is 'real' or also affected by the way the CPI measures prices. Used car prices could genuinely be more volatile than new car prices, for example, because the supply curve is less elastic for used than new cars and demand variability is either the same or greater for used than new cars.

However, examination of how the BLS obtains used car prices suggests another reason for the 'excess' volatility of the used car CPI. The BLS obtains used car price data from the National Automobile Dealer Association (NADA). These data are collected from numerous dealer auctions held across the country. However, there are many other secondary sources of price data. In a pilot study, I compared data from one of these, Kelley's *Blue Book*, to the NADA data. This comparison shows that Kelley's prices are less volatile than NADA prices. These preliminary findings suggest that the Bureau of Labor Statistics should investigate the use of other sources of used car prices.

Moreover by relying on dealer auction prices the BLS is obtaining a biased sample of used car sales. The used cars sold at dealer auctions are cars being sold by rental agencies or governments or business firms. These are typically not the better selling cars. The more popular domestic cars and the increasingly popular imports are often either not sold to rental car companies or sold in small quantities. Hence, the BLS sample is biased toward cars that are not selling well.

I also find that the BLS' quality adjustment methods for new cars may be flawed, thereby echoing a major concern of the Boskin Commission. Since 1987, the BLS has adjusted used car prices for quality improvements. It does so by asking automobile manufacturers to estimate the annual per model cost of quality improvements. The BLS assumes that (1) these estimates are accurate and therefore should affect new and used car price changes and (2) that the percentage quality improvement remains the same as the used car ages. Regression results cast some doubt on the appropriateness of the quality adjustment assumptions. For example, I find that the BLS' estimated percentage quality improvement is not a significant determinant of the percentage price change for the same model of a given age one-year apart. Thus, the used car market is not reflecting the presumed quality difference between these models. This is a surprising and troubling result, because it casts some doubt on the validity of the BLS' reliance on manufacturers' estimates of quality improvement to adjust used car prices for quality change.

The second project inquires into the way microeconomics is taught. The question I address is: why do authors of textbooks emphasize monopoly and oligopoly theories so much more than would appear justified by the relative frequency of imperfect markets in the economy? I reviewed 14 intermediate price theory textbooks published between 1987 and 1999, and I find that the authors devoted an average of 68.9 per cent of the total pages on both competitive and non-competitive product markets to the latter. This is not simply a phenomenon of the nineties. A similar examination of microeconomic textbooks published in the sixties showed that imperfect markets accounted for 64.9 per cent of the total. It appears that this partiality towards monopoly and oligopoly is a long-standing one that persists from one generation of authors to another.

Is this preoccupation with imperfect markets justified by the relative frequency of monopoly or oligopoly? An examination of the distribution of the four-firm concentration ratio for four-digit industries shows that only 11.6% of manufacturing industries had concentration ratios in excess of 70% and 19.8% had concentration ratios in excess of 60%. If the Horizontal Merger Guidelines issued by the Department of Justice and the Federal Trade commission is used as a standard, only 10.6% of the industries had a Herfindahl index above1800, a signpost for a concentrated industry, and 25.9% had a Herfindahl index above 1,000. By the standards adopted by the DOJ and FTC, about three-quarters of the industries would not be considered concentrated. By these standards, there is a reality gap between the extensive coverage that authors give monopoly and oligopoly and the relative frequency of imperfect markets.

Several hypotheses may explain the reality gap:

1. The production of economic understanding may simply require more space because the concepts of monopoly and oligopoly are more difficult for a student to master than those in competitive theory are.

2. Authors are responding to the demands of their readers (largely undergraduate business and MBA students) who are especially enamored of non-competitive markets.

3. Authors and instructors question the relevance of concentration statistics and have strong beliefs that imperfect markets permeate the economy.

4. Authors and instructors stress imperfect markets because they want to justify or enlarge their role in public policy discussions and analyses of firm behavior.

5. Authors select topics for inclusion often based on logical consistency of the theory and not on empirical relevance. Under this point of view, the purpose

of an intermediate micro course is to introduce students to the logic of maximizing behavior and to get the student to think logically. From the instructor's point of view, the relevance of the theory is a secondary detail.

Sam Peltzman

I worked on two projects in 1999/00.

I completed a study of the response of output prices to cost changes. Consumers and politicians often suspect that prices rise promptly when costs increase but that prices do not decline (as fast) when costs go down. The few available case studies often confirm this lay suspicion. My study sought to determine how general this asymmetric response of prices to costs is.

Toward that end I constructed two large samples of products for which the response of prices to costs could be more or less easily measured. One sample consisted of 165 producer goods where a single cost item (crude oil, wheat) accounted for a substantial share of the good's value (wholesale gasoline, bulk flour). The second large sample included 77 consumer goods. In this sample the single significant cost element is the producer price of the good.

For each of these samples, I estimated the speed and size of the response of output prices to increases and decreases in the price of the significant input.
The results were strikingly similar in the two samples, and they confirmed the lay suspicion that prices respond more promptly and more fully to cost increases than to cost decreases. That pattern was found in almost 3 of every 4 products in each sample.

The study appears in "Prices Rise Faster than they Fall," *Journal of Political Economy*, June 2000.

My second project, joint with Kevin Murphy, is an ongoing study of the impact of public school performance on the labor market experience of young workers. The motivation is the timing of the much discussed widening of the college – high school wage premium. This began in the late 1970s, which is just after the end of a period of declining performance of high school graduates (as measured by standard tests such as the SAT). The timing raises the question of whether any part of the higher reward for college is due to a decline in skills acquired in high school.

Our study takes advantage of cross-state variation in both high school performance (as measured by scores on the Armed Forces Qualifying Test) and the labor market experience of young high school graduates.

Specifically, we are analyzing changes in both measures from the early 1970s through the mid 1990s to see if, e.g., the change in labor market experience of high school graduates was worse where the measured performance of high schools declined more.

So far several results have emerged. Wages of young (19-23 year old) high school graduates grow significantly more in states with improving relative school performance. Wages also grow more where the initial level of school system performance was highest. We interpret this level-effect as reflecting the increased demand for skill characteristic of the 1970-1990 period.

Other labor market outcomes for these young labor market entrants, such as the probability of finding employment and their hours of employment, appear unaffected by school system performance.

A related issue concerns the decision to enter the labor force or go on to college. Here we find that the fraction of 19-23 year olds who went on to college grew significantly more in states with improving relative school performance.

This work is ongoing and the results are preliminary. But their thrust is that school quality (as measured by average test scores) affects the formation of human capital. That link has not, as far as we can tell, heretofore been documented.

We hope to have a working paper on this project available in the near future.

Tomas Philipson

This year I have focused my research on the causes and economic consequences ofcreased longevity. As part of this effort, I have worked on the paper "The Rise in Old Age Longevity and the Market for Long Term Care," with Darius Lakdawalla. The paper is in its second revision stage at *The American Economic Review*. The paper analyzes how markets for old-age care respond to the aging of populations.

Concern about the effect of aging on the demand for long-term care has intensified. One reason for this concern is that the aging of the population has been accompanied by several changes that raise the demand for long-term care. These include growth in public subsidies for long term care, declining fertility rates, rising female labor-force participation, and the deregulation of entry barriers to the nursing home industry.

The paper with Lakdawalla considers how demographic forces, which govern the stocks of frail and healthy persons in a population, interact with economic forces, which govern the demand for and supply of care. The interaction of these forces determines the effect of aging on this market. We argue that as the population gets older the demand for market care can often decrease. The reason is that increased longevity also increases the supply of family-provided care, which substitutes for market care, by providing healthy long-lived spouses. Unexpectedly, this implies that growth in healthy elderly males may contract the long-term care market, while growth in healthy elderly females may expand that market.

The paper examines these implications empirically using individual, county and national-level data for the US market for long-term care from 1971 to 1991. We find substantial support for the negative output effect of growth in elderly males. We then decompose the per capita growth in long-term care output over the last three decades into the component accounted for by improvements in health and that accounted for by the greater growth of elderly females compared to males. The novel effects of this unbalanced gender growth among the elderly appear important in explaining the net decline in US per-capita output over the last 30 years, a decline which seems remarkable given the many forces working against it.

I worked on two other projects related to longevity. The first was the completion of the paper "Longevity Complementarities and Competing Risks" (with William Dow and Xavier Sala-i-Martin) that was published in the *American Economic Review*. The second was the completion of the paper "Pricing and R&D when Consumption Affects Longevity," (with Pierre-Yves Geoffard) that is forthcoming in the *The RAND Journal of Economics*. In addition, I have started a project, with Gary Becker, on endogenous longevity and fertility that we will be working on this coming year.

Lastly, I have almost completed a book on data production, *Data Markets: The Production of Health Statistics*, with the final version submitted The University of Chicago Press. As part of that effort I have completed the paper: "Econometric Identification and Incentive Contracting", now forthcoming in ***Econometrica.***

Canice Prendergast

Peter Pashigian, Eric Gould and I are analyzing the role of shopping malls in solving an important externality problem: some stores generate customer traffic that benefits their neighboring stores. Under traditional property arrangements this external benefit is ignored by a store in determining the scale and scope of its activities. Shopping malls represent a market solution to this problem through the rental contracts that are offered to both anchor stores and mall stores. Our results, summarized in "Contracts, Externalities, and Incentives in Shopping Malls: An Empirical Analysis," strongly suggest that malls fulfill this role.

We illustrate how malls take account of this externality in two ways. First, we simply document the differences in rental contracts in our sample of malls. Specifically, anchors – the large stores that generate traffic for the smaller stores in the mall - occupy approximately 60% of mall space, yet only pay 10% of total rent collected by the developer. Almost 70% of anchors are offered contracts that specify that no rent should be paid, while no mall stores are offered such contracts.

Second, we test for a more explicit relationship by considering the relationship between the externalities created and the rent paid by the mall stores. For example, suppose that the existence of a particular anchor affects the sales of jewelry stores more than it does the sales of women's apparel stores. Then we would expect to see that introducing such an anchor to the mall would increase the rents (and possibly size) of the jewelry stores relative to those of the apparel stores. In this way, the anchor can capture more of the benefits from the externalities it creates.

Our results support this relationship between externality generation and rental contracts. We illustrate this relationship this in two stages. First, we estimate the effect of anchor sales on the sales of different types of mall stores within the same mall. For example, what is the marginal effect of locating a high-end anchor in a mall on the sales of bookstores in the same mall? This first stage regression yields a coefficient that is the answer to this question for every mall store type and anchor type.

Second, we see whether these coefficients predict rents paid by the mall stores, and find that they do: those types of stores which are most sensitive to the introduction of an anchor pay most rent when that anchor is present. Those for whom there is little effect on sales have rent which changes little. Thus, we can tie rental contracts directly to the externalities generated by the anchor stores.

Our second objective in this study is to analyze the incentive contracts offered to developers and stores in the malls. Contracts offer both base rent that should be paid (often zero) and "overage", which is a percentage of sales revenue that accrues to the developer of the mall. Overage contracts usually kick in after a critical value of the sales per square foot for the store. Almost all mall stores have contracts that specify overage payments, while roughly a quarter of anchor stores operate under such contracts. We are currently working on understanding how these contracts allocate incentives to the developers, anchor stores, and mall stores. Our results on this issue are still preliminary, but suggest a sensible tradeoff in the provision of incentives in this team production setting when there is a binding budget constraint.

Raghuram Rajan and Luigi Zingales

During the last year our research focused on two main areas: i) theory of the firm, and ii) political constraints on financial development.

i) Theory of the Firm

We finished a theoretical piece "The Firm as a Dedicated Hierarchy: A Theory of the Origins and Growth of Firms", which is forthcoming in the *Quarterly Journal of Economics*. In this paper we focus on one of the main problems faced by entrepreneurs in the formative stages of their businesses: they have to provide incentives for employees to protect, rather than steal, the source of the firm's value. We study how the entrepreneur's response to this problem determines the organization's internal structure, growth, and its eventual size. We predict that large, steep hierarchies will predominate in physical-capital intensive industries, and have seniority-based promotion policies. By contrast, flat hierarchies will prevail in human-capital intensive industries and have up-or-out promotion systems. Furthermore, flat hierarchies will have more distinctive technologies or cultures than steep hierarchies. The model points to some essential differences between organized hierarchies and markets.

The results of this paper lead us to conduct (with Krishna Kumar of USC) an investigation on the actual determinants of firms' boundaries. The question that intrigues us is why is it that a small country like Finland has such large successful firms such as Nokia? In "What Determines Firm Size?" we analyze the determinants of firm size across industries and across countries in a sample of 15 European countries. We find that, on average, as might be expected, firms facing larger markets are larger. At the industry level, we find firms in the utility sector are large, perhaps because they enjoy a natural, or officially sanctioned, monopoly. Capital-intensive industries, high wage industries, and industries that do a lot of R&D have larger firms, as do industries that require little external financing.

At the country level, the most salient findings are that countries with efficient judicial systems have larger firms, and, correcting for institutional development, there is little evidence that richer countries have larger firms. Interestingly, institutional development, such as greater judicial efficiency, seems to be correlated with lower dispersion in firm size within an industry.

The effects of interactions (between an industry's characteristics and a country's environment) on size are perhaps the most novel results in the paper, and are best able to discriminate between theories. As the judicial system improves, the difference in size between firms in capital-intensive industries and firms in industries that use little physical capital diminishes, a finding consistent with "Critical Resource" theories of the firm. Finally, the average size of firms in industries dependent on external finance is larger in countries with better financial markets, suggesting that financial constraints limit average firm size.

ii) Political Constraints on Financial Development

In "Financial Systems, Industrial Structure, and Growth" we summarize our previous work, as well as that of many others, on the empirical link between financial development and growth. The amount of evidence we were able to gather on the beneficial effects of a country's financial markets development on subsequent economic growth is overwhelming. This has led us to ask why all countries do not have developed financial markets.

To try and answer this question we examined the evolution of financial markets in different countries during the 20th Century. We found that most continental European countries were more financially developed in 1913 than in 1980 and that the level of financial development is not driven only by the level of economic development. These findings lead to two questions: i) what explains the different level of financial development reached in 1913, ii) what explains the reversal of financial development during the 20th century.

We address these questions in "The Great Reversals: The Politics of Financial Development in the 20th Century." In this paper, we suggest that despite its widespread benefits, not all countries reach a political consensus in favor of financial development. Moreover, a consensus, even when reached, need not persist. The forces against markets in general, and financial markets in particular, are strengthened in times of political and economic crisis, especially because countries close themselves to external influence like trade and capital flows. During such times, financial development can be reversed. And the passing of the crisis need not immediately bring renewed financial development because the anti-market forces are now entrenched.

These results imply that in addition to institutional factors such as a country's legal and accounting systems, factors such as how open the economy is to moderating outside influence, or how centralized the political system is, will be important in explaining cross-country differences in development today, and over time. In particular, we suggest why many countries in Continental Europe reached a pinnacle of financial market development just before the First World War, but unlike the Anglo-American economies, did not regain such a level till the end of the 20th century.

Sherwin Rosen

My paper, "Potato Paradoxes" analyzes some unusual consequences of the fact that potatoes, in the form of seed crop, serve as inputs into their own production. The practical consequences of this are analyzed in a simple model and applied to the Irish Potato Famine of 1845-7. False expectations that the potato blight was temporary caused farmers to over-save their seed crop for next year's planting. In hindsight they should have eaten their seed crop and switched to other foods. This paper was published in the *Journal of Political Economy*.

"The Theory of Earnings Distributions," written with Derek Neal, was published in the *Handbook of Income Distribution*. This is a wide-ranging survey of various economic theories of earnings distributions, including stochastic theories, human capital, theories of the upper tail (Pareto distributions), information theories, rent and selection theories and several others.

My paper with Allen Sanderson, "Labor Markets in Professional Sports," considers the main economic issues that have been analyzed by economists in sports labor markets. These concern the nature of property rights and free agency, how wages are determined, wage and other kinds of discrimination, league balance, attempts to restrict competition between teams, and human capital development. Both conceptual and empirical aspects of these markets are discussed. This paper will appear in the *Economic Journal*.

Li Hao and Wing Suen and I have completed a draft of "Conflict and Cooperation in Committee Decisions." This considers the problem of pooling independent information among a small group of decision makers who have different and possibly biased views about the value of the decision. One example would be a hiring decision. Another would be jury decisions. We show that, to reach the best decision, some information must be suppressed if preferences among committee members differ. The reason is that each member of the group attempts to manipulate other opinions by exaggerating his data. To reduce this tendency to exaggeration, the group must place limits on how much information can be revealed. Specifically, the committee will suppress information on how much better one option is than another and rely more on simple ranks (A is better than B). This is what voting mechanisms accomplish. Economists have long criticized voting methods for not allowing the full intensity of one's preferences to be expressed. However, in this instance, such expression leads to irreconcilable differences of opinion. Voting, by precluding exaggeration of the intensity of one's preferences, can lead to better decisions in these cases.

Lester Telser

This past year I edited a collection of leading contributions to the theory and practice of futures trading. This book, *Classic Futures: Lessons from the Past for the Electronic Age* has just been published in by Risk Publications in London. It contains 27 chapters, including two new essays of mine. These explore the role of electronic trading and provide a mathematical model and program for computing the competitive equilibrium in an electronic futures market.

The rest of the book includes chapters by Frank Knight from his *Risk Uncertainty and Profits*, Alfred Marshall on hedging and speculation from his *Industry and Trade*, Abbott Payson Usher on "Mediaeval and Modern Produce Markets," J.M. Keynes on Speculation from his *General Theory*, several articles by Holbrook Working, the famous article by Nicholas Kaldor on the convenience yield from inventories and on to the recent research of Benoit Mandelbrot. One chapter by R. H. Hooker from the 1901 *Journal of the Royal Statistical Society* is a statistical study of the effects of the suspension of trading of the Berlin Produce Exchange. It may be the first statistical study of the effects of a government action on the trade of an important commodity.

My work on the model of an electronic future exchange has led me to more ambitious models of pure exchange in which traders may be buyers or sellers of elaborate bundles of commodities representing hedging or arbitrage strategies. Electronic trading of futures is increasingly important, and I hope this work will shed light on how such electronic markets will function.

Rob Vishny

Andrei Shleifer and I have been continuing our research on the causes and consequences of cross-country differences in legal protection of investors as well as our research on behavioral finance and the implications of market inefficiencies. Below I describe two recent projects.

The better is the legal protection of investors' rights, the higher we expect investors' valuations of securities relative to fundamental accounting measures such as sales, earnings and cash flow. Our paper "Investor Protection and Corporate Valuation" examines this link using firm level data from 27 countries. The results indicate that, controlling for various other factors, higher levels of investor protection are associated with higher valuations of firms.

We also examine the role of ownership structure in explaining valuation. In particular, we are interested in the separation of (cash flow) ownership and control. Outside the U.S., there is much effort devoted by large shareholders to controlling companies with minimal cash flow ownership through pyramiding schemes. In these cases, shareholders are more exposed to diversion of value through questionable asset sales, security issues and transfer pricing schemes. Our evidence suggests that, where large shareholders control a company with relatively small ownership stakes, valuations are lower than when the dominant shareholder owns a larger portion of the firm's cash flows. This is consistent with Jensen-Meckling (1976). There is also some (weak) evidence that ownership is a more important factor where legal protection of outside shareholders is poor and diversion of value is easier.

In another project, we are examining the role of mergers in an environment where many (but not all) stocks are potentially overpriced relative to their long-run values. This might correspond to the situation in the early 1970s or else possibly to the current market environment. In our framework, overvalued firms purchase more rationally priced firms in order to turn their temporarily overpriced stock into hard assets before stock prices revert toward fundamental values. A recent merger of this type might be the AOL/Time Warner combination.

We think that this framework is capable of explaining various phenomena: (1) why it might be rational and in shareholders' long-run interest to make an acquisition even though the stock price reaction to the merger announcement is quite negative; (2) why it appears that merger waves are procyclical, i.e., many more mergers occur when stock prices are high than when they are low and why the proportion of equity-financed deals is higher when the market is higher; (3) why the proportion of diversifying mergers is higher when the stock market is high. We also hope to explain when such mergers occur based on the time horizons and personal ownership stakes of the relevant decision-makers at the target and acquiring firms.

VISITORS

Claire Friedland

In 1999-2000 I filled in some of the blanks in my catalogue of the photos in the Stigler-Friedland photo archive. This archive, created in connection with our production of five calendars of economists' birthdays, is destined for Regenstein Library Special Collections, where the photos will be made available to the public.

I have also begun work on a brief essay on little-known collections of economists' portraits. This essay will appear as a preface to my photo catalogue.

In addition, I advised numerous scholars inquiring about the Stigler papers and the history of the Chicago School of Economics.

Kishore Gawande

During my visit to the Stigler Center I worked on three papers that are part of an ongoing NSF project on effectiveness of legislation and government. The papers are all in the area of law and economics with specific application to the US Coast Guard (USCG), and all involve my co-author Alok K. Bohara (U. of New Mexico). The construction of dataset and the analysis of the data were the major focus of my visit to the Stigler Center.

The first paper examines the economics of the public enforcement of maritime law by the USCG. An extension of Becker's penalty rule to ex ante examinations of vessels was developed, and panel data on USCG inspections of tank ships and tank barges and pollution incidents concerning these vessels were used to investigate whether USCG inspections are in line with the prediction. It was found that USCG penalties based on ex ante inspections are sub-optimal, and a more optimal system of penalties would make USCG inspection activities more effective in reducing pollution.

The second paper investigates how and why the Oil Pollution Act of 1990 may have been responsible for the dramatic reduction in pollution incidents that subsequently occurred. Two mechanisms are investigated. The first is the increase in the marginal effectiveness of USCG compliance and safety inspections via a comparison of their effectiveness before and after the Act. The second mechanism is actions undertaken privately by vessel owners/operators (and insurance companies) in response to the more explicit financial liabilities instituted under the Act. For this purpose stock market data are used to study whether and how news of pollution incidents are reflected in stock prices. If this second mechanism is important, it should be the case that the response of stock prices to news about pollution would lower stock prices more than a comparable incident before the Act.

The third paper is an econometric extension of detection-controlled estimation (e.g. Feinstein, *JPE* 1990) to a setting with a panel of count data. Similar questions are asked as in the first paper, above, using detection controlled estimation, and the results are found to be robust to this new estimation method.

In addition to the three papers discussed above, I also worked on three other papers during my visit. The first of these is a paper on property prices and the transportation of nuclear waste (with Hank Jenkins-Smith, U. of New Mexico). It will be published in the *Journal of Environmental Economics and Management*. Second, I started a project that is nearing completion with Pravin Krishna (Brown U.) on extending the Grossman-Helpman model of endogenous protection to include foreign lobbying. The predictions from this model are being tested using foreign lobbying data. Third, I completed a first draft of a paper (with Alok Bohara and Pablo Sanguinetti (Di Tella U., Buenos Aires)) testing a set of political economy models of regional trade agreements using a panel data set from the Mercosur pact countries. I presented this paper at a conference on regional trade agreements at Yale in April.

Michael Moore

My research focused on the effects of government regulation on social outcomes. I spent much of my visit to the Stigler Center examining, specifically, restrictions on tobacco use, especially workplace smoking bans and excise taxes. This research examines critically the received view on tobacco policy. It is now widely held that restrictions on smoking will reduce both quantity smoked and smoking participation, and that these reductions will lead to improvements in health. There are several reasons why these beliefs may be wrong, and I sought to examine three of these in detail.

My paper on smoking bans, "The Political Economy of Workplace Smoking," examined whether bans on workplace smoking actually reduced smoking. The data show clearly that there is less smoking by workers where smoking in the workplace is banned. However, an alternative view is that this observed association is more reflective of the political economy of the workplace, whereby nonsmokers seek to impose bans via the exercise of political power. For example, I find that older workers in workplaces with bans, who chose their smoking status before any ban was imposed, also smoke less frequently than their counterparts in places without a ban. This tends to support the 'political economy' view, since these non-smoking older workers were unaffected by the ban but would often prefer to work in a non-smoking environment.

I examined the relationships between smoking regulations and health care costs in the other two papers. Both papers examine two structural economic relationships: between the regulations and smoking, and between smoking and health care costs. Extensive literatures document significant relationships in both cases, and a number of analysts have combined empirical evidence of this nature to conclude that regulations on smoking will lead to lower health care costs. Inferences from ad hoc policy experiments such as this, which are extensive in the literature, are not valid, however, and I examine a number of reasons why. The approach that I use compares the results obtained in this ad hoc manner to those obtained by direct estimation of the effects of the regulations on health care. There is consistent evidence of an at best weak regulatory effect, which is certainly less important than previously believed.

Passive smoking has recently become a major focus of health policy. My paper, "Passive Smoking: Health Perceptions Myth vs. Health Care Reality," tries to get at the effects of passive smoking on health. Individuals exposed to passive smoke in the workplace consistently rate their health lower than those who are not exposed. Likewise, individuals who report being in poorer health tend to use more health care. However, I find no statistical association whatever between exposure to passive smoke and health care utilization. Thus individuals exposed to passive smoke appear to be exaggerating the effects of the smoke on their health.

One source of this bias may be found in the kind of risk posed by passive smoking: it is extremely small, highly publicized, and not well understood. These three features make it easy to exaggerate the influence of passive smoke in a self-assessment of health status. If subjective health assessment contains an element of this perceived risk, then the health assessments will be biased in a similar fashion. But if there is no objective health deterioration, health spending will be unaffected, as I find. This paper will be published in the *Journal of Risk and Uncertainty*.

The third smoking paper, "The Health Care Consequences of Smoking and its Regulation," examines the effects of tobacco tax increases on health care utilization. I find that the main effect of higher taxes operates through the decision to quit smoking. The effect on smoking intensity is small. I then show that the direct effects of taxes on health care spending are smaller than previously thought. This paper will appear in Gruber, ed., *Frontiers in Health Policy, v.4.* (National Bureau of Economic Research).

I also completed a paper (with Philip Cook) on youthful drinking. We examine three broad forces: contemporaneous restrictions such as the minimum purchase age and excise tax, similar restrictions from early youth, and social influences that are measured by adult drinking. Our most interesting finding is the lasting effect of the early minimum purchase age on later binge drinking. This is consistent with the habit formation/rational addiction model, and indicates that early interventions can have lasting effects on heavy drinking, and on related outcomes such as traffic accidents, unwanted pregnancies, and retarded human capital production. This paper will appear in Gruber, ed., *The Economics of Risky Behavior and Youth* (National Bureau of Economic Research).

Finally, I completed papers on the informal costs of care giving for U.S. Veterans with Alzheimer's Disease, the injury effects of the voluntary chain saw standards, and a 25 year retrospective of the Consumer Product Safety Commission. My work in progress for the year includes a book manuscript that collects and integrates my research (joint with Wes Magat) on product safety regulation, a paper that integrates the literatures on addiction, human capital accumulation, and family formation, and my research (joint with Phil Cook and Alan Parnell) on the effects of abortion policy in North Carolina on pregnancy outcomes.

Ignacios Palacios-Huerta

I worked in three areas during my visit to the George J. Stigler Center. These were the analysis of the endogenous formation of preferences, the empirical properties of rates of return to human capital, and an empirical test of agency theory in the firm.

The concept of endogenous preferences implies that not only do individual preferences help to determine economic outcomes, but also that the economic, social, legal, and cultural structure of society affects preferences. My paper "A Theory of Markets and Endogenous Preferences" develops this idea. The key feature in the model is the interplay between the extent of the market, competitive interactions among individuals, and the formation of preferences. I develop the model through an example in which individuals' attitudes toward risk are affected by their exposure to market risks as well as non-market uncertainties. Empirical evidence from various fields supports the basic implications of the framework. These include various aspects of the economics of institutions as "constraints that shape human interaction and reduce uncertainty" (North, 1990), the demand for beliefs and subjective probabilities (e.g., religious beliefs, superstitions), and preference formation within the family.

The fact that norms, cultural values, customs and traditions are generally embedded in preferences implies a link between preferences and institutions that deserves rigorous formal analysis. This relationship is often described informally in the literature on institutions and socioeconomic performance. It is clear from this literature that the kinds of organizations, the forms of governance and the types of norms, values and traditions found in society vary greatly across time and space. As far as I know, my analysis is the first in which the connection between economic forces and preferences (e.g., norms, values) and institutions (e.g., governments, firms and organizations) integrated into a single framework.

My paper, "An Empirical Analysis of the Properties of Human Capital Returns," compares rates of return on human capital returns across demographic, education and experience groups, and with those obtained from liquid investments. These comparisons permit one to determine how much is gained or lost from investments in one form rather than in another, whether there is under- or over-investment in different types of human capital, and whether capital market frictions may be impeding the flow of resources into some human capital assets.

The analysis incorporates novel features that allow me to overcome problems in the literature. For example, I derive a measure of marginal risk from an analysis of utility maximization, and I compare returns that are adjusted for the riskiness of human capital investments. I estimate that the gains from college education per unit of risk are about 5 to more than 20 percent greater than from financial assets for the different demographic groups, whereas the loss of return from not going beyond high school is typically greater than 15 percent relative to risky financial returns. Risk adjusted differences in rates of return are found across sex and race groups with identical human capital holdings. These estimates suggest that frictions may be present at low education levels. The paper discusses some implications of these results for policy questions such as the effects of education on earnings and productivity, whether there is under-investment in education, the role of risk in the structure of wages, and the optimal "social" rate of discount for evaluating benefits and costs from public investment.

In "The Human Capital Premium Puzzle" I uncover a heretofore unrecognized relationship between consumption and human capital returns. Specifically, I show that there is a "human capital premium puzzle": the riskiness of human capital assets is too small to justify the extra return on human capital assets over the riskless asset. What then determines the size of the risk-adjusted human capital premium? What are the relevant "frictions" in human capital markets responsible for the premium? My analysis examines the extent to which factors like short-sale constraints and irreversibility (you cannot sell human capital 'short' or otherwise reverse the investment), borrowing and solvency constraints, and the psychic costs of investment help explain the size of the human capital premium. I find that the main reason for the human capital premium is the fact that human capital assets cannot be sold. Frictions in human capital markets are notably different across demographic groups, and decrease with education and experience.

These two papers provide the first connection between the modern human capital and financial capital (portfolio theory and asset pricing) literatures, two areas that have become increasingly distant over the last three decades.

Both of my papers on agency theory try to provide evidence in an area where empirical research has lagged considerably behind theory.

The first one, "An Empirical Test of Agency Theory and Optimal Incentive Contracts," joint with Ana I. Saracho, uncovers a heretofore unrecognized theoretical relationship between durability on the demand side and the relation between a firm's managers and owners. The main insight of the paper is derived from Coase's argument that the monopoly price of a durable good would be constrained by the monopolist's inability to commit not to increase output in the future. That argument implies that durability of a firm's product should affect the optimal contract between owners and managers. For example, the incentive of owner's to tie a manager's pay to long-term profits (stock prices) rather than current profits would be greater in a firm producing a more durable product. In this way, the analysis indicates that durability of output affects the firm's internal contractual relationships. I then test the empirical implications for optimal compensation contracts using data on compensation of top executives at large corporations. Consistent with the predictions of the analysis I find that managerial compensation of durable goods firm are tilted away from reliance on short-run profits and toward longer term compensation incentives (e.g. stock options).

The second paper on agency, "An Empirical Examination of Sabotage in Tournaments," joint with Luis Garicano, is an empirical analysis of incentive schemes with multidimensional efforts. It provides the first explicit empirical tests of worker-incentive models in which individuals can devote costly effort not only to improving their own output but also to decreasing opponents' outputs. We do so by exploiting a change in scoring in European soccer league tournaments whereby the reward for a win was increased relative to the penalty for a loss. We also use the fact that the same teams were simultaneously playing in a different tournament in which the relative reward for a win was unchanged. Our dataset has detailed information on both offensive effort (i.e., increasing one's own output) and defensive effort (reducing the rival's output) of each team. We find that the increase in the relative reward for a win led to increases in both defensive and offensive effort. We also find that total scoring did not increase and that weaker teams engaged in relatively more defensive activity. All these findings are consistent with the predictions of the sabotage-based theory of tournaments.

Michael Whinston

During my visit I worked on projects related to contracting, vertical integration and externalities.

In "The Mirrlees Approach to Mechanism Design with Renegotiation" (with Ilya Segal) we develop a general method for determining what can be achieved by contracts when agents are free to renegotiate the terms of their contracts. In particular, we provide a method for determining the nature of optimal contracts in contexts where hold-up problems and risk-sharing problems make the possibility of renegotiation especially important.

One such application of our method is to exclusive dealing provisions in manufacturer distributor contracts. These are sometimes suspected of reducing competition. However, they can also be used to encourage investments by a manufacturer in a dealer network of a type that benefits rivals. Such investments might not be made if exclusive dealing contracts were banned. Our paper shows how the effect of allowing or banning exclusive dealing can be evaluated in this situation. It also shows the degree to which other contractual provisions – such as price and quantity terms – can be used as substitutes for exclusive dealing.

A recurring theme in the economics of vertical integration is the extent to which the saving of transaction costs motivates vertical integration. One approach, associated with Oliver Williamson, focuses on the saving in transaction costs achieved by integrating assets that are specific to the relationship between an input producer and consumer. My paper, "On the Transaction Cost Determinants of Vertical Integration," addresses the question of how Williamson's explanation for vertical integration can be distinguished empirically from the more recent (and formal) approach developed by Grossman-Hart-Moore. It also discusses to what extent the existing empirical literature on the subject provides evidence for the Grossman-Hart-Moore model of integration.

Sometimes a contract between two parties generates an externality for another contract involving one of the parties. This occurs, for example, in vertical contracting relationships - a retailer who competes with other retailers cares about how much they purchase from a manufacturer. Similarly one lender cares about how much other debt is assumed by a borrower, and one insurer cares about how much insurance its customer has bought from other insurers. In "Robust Predictions for Contracting with Externalities" (with Ilya Segal) we examine what can be said in general about the outcome of these situations under a wide range of contracting processes. A central feature of the analysis is the important role played by contracts that contain menus (for example, a schedule of alternative interest rates) rather than single provisions.

I am studying the location choices of builders of single-family houses. Builders' decisions of where to locate houses have an important bearing on their success and are essentially irreversible. Two aspects of this decision motivate my study: (1) the externalities that arise because existing residents (or future neighbors) are affected by a builder's location decision, and (2) that because these houses are built in sequence, some individuals are in the position of a first-mover relative to the owners of neighboring lots. Both aspects of the problem are widely discussed in the economics of industrial organization and regulation. For example, does Coasian bargaining or other mechanisms lead to internalization of externalities? Can a first-mover credibly precommit to a strategy that affects decisions of subsequent entrants? The notion of credible precommitment has become widely used in theoretical models in industrial organization and elsewhere, but its importance has yet to be convincingly documented.