

# MARKET DISCIPLINE

## ECONOMICS 484

(A PRIMER FOR THOSE IN A STATE OF SHOCKED DISBELIEF)

FALL 2017

PROFESSOR J. P. HUGHES

OFFICE HOURS MON. 10:15 - 11:45, WED. 10:15 - 11:45

AND BY APPOINTMENT AT OTHER TIMES

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**Prerequisites:** 220:203 or 320 (Intermediate Microeconomic Analysis) and 220:322 (Econometrics); This is an upper-level economics elective.

**Required Daily Reading:** *Wall Street Journal*, <http://r.wsj.net/hZSGn> (subscribe for \$1 per week for 10 weeks)

**Background:** Prior to the Great Recession, former Federal Reserve Chairman Alan Greenspan frequently expressed confidence that bank management would maximize the value of its shareholders' investment. If it failed in this task, it would suffer the consequences of market discipline. Here's an example:

**"Except where market discipline is undermined by moral hazard, for example, because of federal guarantees of private debt, private regulation generally has proved far better at constraining excessive risk-taking than has government regulation."**

– Alan Greenspan in a speech to the Forty-first Annual Conference on Bank Structure at the Federal Reserve Bank of Chicago, May 2005

Citigroup as well as other large financial institutions took a great deal of risk prior to the Great Recession:

**"When the music stops, in terms of liquidity, things will be complicated. But as long as the music is playing, you've got to get up and dance. We're still dancing."**

– Charles O. Prince, former CEO and Chairman of Citigroup, in an interview by Nakamoto and Wighton in the *Financial Times*, July 2007

The claim by the Citigroup CEO that, "as long as the music is playing, you have to get up and dance," hints that maximizing the bank's expected value may entail considerable risk-taking. And, as he confesses, when the risk-taking turns out badly, "things will be complicated."

**"...those of us who have looked to the self-interest of lending institutions to protect shareholders' equity (myself especially) are in a state of shocked disbelief."**

– Alan Greenspan in testimony to the House Committee on Oversight and Government Reform, October 2008

These complications shook Greenspan's faith in the "self-interest of lending institutions to protect shareholders' equity" and left him in "a state of shocked disbelief" as the financial panic that began with the failure of Lehman Brothers unfolded and left Citigroup as well as many other financial institutions in dire condition.

**Greenspan suggested that market discipline failed.**

**Prince suggested that market discipline worked (even though the outcome was not good).**

**How does market discipline work – and fail?** Firms in market economies face the discipline of the market – some more than others. We shall read a number of published research papers that consider this issue. For example, does managerial compensation that includes an ownership stake in the firm provide managers an incentive to operate efficiently? If managers own a considerable stake, do they work hard to maximize the value of the stake or do they exploit the power of their ownership to pursue personal objectives that erode firm value? Do managers avoid potentially profitable risk-taking to protect their positions? Do owners of large blocks of stock monitor managers and discipline them when they fail to maximize the firm's value? If managers fail to achieve their firm's potential value, do outsiders try to purchase sufficient ownership to oust the managers and institute reforms to improve value?

A notable case of the failure of market discipline occurred on September 16, 2008, the day after the Federal Reserve refused to rescue Lehman Brothers. On that day it made an \$85 billion loan to an insurance company, AIG, and effectively took it over.

**"The company was on the brink of default, and our intervention would spare it the discipline of the market."**

-- Ben Bernanke in testimony at the class action lawsuit brought by Hank Greenberg over the AIG take-over by the Federal Reserve, October 2014

**Pedagogy:** The course will be run as a seminar where a research paper is read in advance of class. The seminar will be divided into groups that collaborate in presenting and discussing the assigned paper. In addition, we shall apply statistical analysis to data on U. S. commercial banks to address some of the same questions considered by the published papers discussed in class. With statistical probing, these data will reveal fascinating relationships between a firm's performance and its ownership structure, the structure of its board of directors, its managerial compensation, and competition from other firms in the markets in which it operates.

**Formal Course Description:** Theories and evidence of the effect of agency problems on the economic performance of firms and on the role of internal mechanisms (board of directors, managerial compensation, and financing) as well as external forces (product markets, capital markets, and labor markets) in disciplining managerial inefficiency at for-profit and not-for-profit organizations, mutuals, and cooperatives.

**Learning Goals:** This course seeks to achieve the department's goal of **economic numeracy**. "Students who complete the economics major should be familiar with the tools, techniques and methods of empirical economics. They should be able to analyze data using computer applications and should be familiar with regression methods and other statistical techniques. They should be able to read and assess general interest articles on economic topics. In addition, they should be able to understand and evaluate key findings in published economic research from a wide range of sources including academic economists, public policy 'think tanks,' and government agencies."

**Basis of Evaluation:** The course grade will be determined by econometrics assignments and quizzes, which shall determine 85 percent of the final grade, and by a final examination (Wednesday, Dec. 20, 9:00 – 11:00 AM – *note the later starting time*), which shall determine the remaining 15 percent of the final grade. In lieu of make-ups, the lowest two grades on quizzes and econometric assignments will be dropped. Quizzes and econometrics assignments each count equally. An average grade between 85 and 100 is an "A," between 80 and 84, a "B+," between 75-79, a "B," between 70-75, a "C+," between 65 and 69, a "C," between 55-64, a "D," and less than 55, an "F." **Students are expected to attend all classes. Poor attendance will result in a failing grade.**

# OUTLINE OF TOPICS AND ASSIGNMENTS

## Introduction: The Corporation

While markets discipline a wide variety of economic agents and organizations including for-profit, not-for-profit, mutual, and cooperative organizations, the corporate form of the for-profit organization draws much attention from writers in the popular and scholarly press. News of corporate scandals involving the failure of market discipline frequently jumps off the front pages of newspapers. News of bidding wars for apparently undervalued corporations, perhaps reflecting the functioning of market discipline, similarly catches the eye. What is a corporation? How does it differ from a sole proprietorship and a partnership? How did it evolve? How do we measure its economic performance?

## I. Incentive Problems Arising from the Separation of Ownership and Management

Ownership of the corporation can be concentrated in the hands of very few – say, the founder and the founder’s family – or dispersed over many owners as in the case of a corporation whose equity is publicly sold. The ownership stake of the firm’s managers can range from the entire firm to none of the firm. How do the degree of concentration of ownership and the ownership

### Class 1 Wednesday Sept 6

**Before class**, start the exercise (on Sakai Resources), “**Market Discipline: The First Day.**” Note that you must register online for SAS®OnDemand. Do this before class.

Do not wait until class to register for SAS®OnDemand and to begin the econometric tasks specified in “Market Discipline: The First Day.” You could wind up lagging behind in class if you wait until then to register.

**Bring a laptop with a fully charged battery to class.** In class, we shall use SAS®OnDemand to carry out the econometric tasks defined in “Market Discipline: The First Day.”

stake of managers influence the firm’s economic performance? There are some classic discussions of these questions – as early as Adam Smith’s in the *Wealth of Nations*. The classic formal discussion begins with the contribution by Michael Jensen and William Meckling.

## II. Looking for Evidence of Agency Costs

Jensen and Meckling defined agency costs in terms of the market value lost after the owner-

manager of a firm sells part of the firm to outsiders. Empirical studies looking for evidence of agency problems and their associated costs have traditionally sought to link performance to ownership structure and other variables that potentially influence managers' incentives to make efficient production and investment decisions. In these studies performance is measured in a variety of ways: the cost of production, the profits earned from production, the market value of the firm, and so on.

These studies can only obtain *indirect* evidence of the existence of agency costs since they seek to find a correlation between ownership structure and achieved performance, not the between ownership structure and lost performance. Jensen and Meckling's definition of agency costs focuses attention on potential performance and the shortfall in achieved performance.

### **Class 2 Monday Sept 11 COMPUTER INVESTIGATION**

We shall complete the econometric tasks defined in "Market Discipline: The First Day."

In addition, we shall consider the Jensen-Meckling Utility Maximization Problem (available on Sakai Resources), which illustrates the classic treatment of the theory of the firm where there is a separation of ownership from management and outside owners can monitor management only at a cost (imperfect monitoring). The article (optional) is

- Michael C. Jensen and William H. Meckling, 1976, "Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure," *Journal of Financial Economics* 5, 305-360 [read 305-319, 328-330]. (available at the online library reserve)

Consider the following:

- A. Define agency costs.
- B. How does the proportion of the firm owned by managers affect their incentives to make efficient production and investment decisions?

Another strand of the literature looking for evidence of agency costs attempts to measure

### **Class 3 Wednesday Sept 13**

#### **A. Implementing the Jensen-Meckling Definition of Agency Costs**

- James S. Ang, Rebel A. Cole, and James Wuh Lin, 2000, "Agency Costs and Ownership Structure," *Journal of Finance* 55, 81-106. (available at the online reserve)

agency costs directly by asking what is the best performance observed among firms. For example, which firms have the lowest costs of production, the highest profits, or the highest market values? The best-practice firms provide a benchmark to estimate potential performance and the failure of other firms to achieve it – their lost performance, a gauge of their agency costs.

### **B. Empirical Evidence Based on Market Value**

In a classic and influential study, Randall Morck, Andrei Shleifer, and Robert W. Vishny considered the empirical relationship between the proportion of a firm owned by its managers and the firm's economic performance. They hypothesized that managerial ownership creates two contrasting incentives: first, a higher ownership stake better aligns the interests of managers and outside owners and, second, more managerial ownership enhances their control over the firm and makes it harder to oust them when they are not efficient. These authors provide evidence that the so-called alignment-of-interests effect dominates the entrenchment effect at lower levels of managerial ownership while the entrenchment effect dominates over a range of higher levels.

#### **Class 4 Monday Sept 18**

- Randall Morck, Andrei Shleifer, and Robert W. Vishny, 1988, "Management Ownership and Market Valuation: An Empirical Analysis," *Journal of Financial Economics* 20, 293-316. (available at the online library reserve)

### **C. Empirical Evidence Based on Best-Practice Profit (Profit Frontiers)**

Microeconomic theory defines the profit function as the maximum profit a firm can earn given the output and input prices it faces. The profit function assumes that managers are efficient. When it is estimated using data from firms in an industry, it is usually fitted to the data as an average relationship. A firm's actual profit may exceed or fall short of the profit predicted by

#### **Class 5 Wednesday Sept 20**

- Robert DeYoung, Kenneth Spong, and Richard J. Sullivan, 2001, "Who's Minding the Store? Motivating and Monitoring Hired Managers at Small, Closely Held Commercial Banks," *Journal of Banking and Finance* 25, 1209-1243. (available at the online reserve)

the estimated profit function. Is this difference due solely to statistical noise or is this firm more or less efficient than the "average" captured by the estimated function?

Rather than fit the profit function to the data as an average relationship, another approach seeks to fit it as an upper envelope, taking into account randomness. As an upper envelope

(stochastic frontier), the estimated profit function captures best practice – the highest observed profit at a given set of prices and adjusted for luck. After eliminating the influence of luck, the difference between the best-practice profit and a firm’s observed profit gauges its agency cost – its “profit inefficiency.”

In the paper, “Who’s Minding the Store? Motivating and Monitoring Hired Managers . . .,” De Young and his co-authors use this type of profit function to gauge agency costs at small commercial banks whose owners may be directly involved in its management or may have hired outside managers. How does the relationship between ownership and management at these firms influence these banks’ profit efficiency?

### Class 6 Monday September 25 COMPUTER INVESTIGATION

#### ● Research Assignment 1

This assignment is found at the end of the schedule.

*Your work in programming the software, in organizing the output, and in interpreting it should be your own work. Do not borrow from anyone else. Bring it to class to submit. Staple or clip together all pages – no loose pages, please. **Submit it on time.***

### Class 7 Wednesday September 27

- Francisco Pérez-González, 2006, “Inherited Control and Firm Performance,” *American Economic Review* 96: 5, 1559-1588. (available at the online reserve)

## **D. Empirical Evidence Based on Event Studies**

Suppose the founder-CEO of a publicly traded firm announces that she is retiring and that her son will succeed her as CEO. Assuming that this announcement was not anticipated by market participants, the reaction of her firm’s stock price (adjusted for overall market movement) can be used to gauge how the market expects the managerial change to affect the firm’s future performance. How would you expect the market to react?

Warren Buffet has observed that a firm’s choosing its CEO from the family of the founder can resemble picking the 2020 Olympic team from the eldest children of the gold medal winners of the 2000 Olympic team. Doesn’t the ownership stake of the founding family give them the incentive to insure that the firm is run well – that the firm’s managers maximize its value to all shareholders? Can outside owners unrelated to the founding family and the firm’s managers exert any discipline over under-performing managers, even when they are founders and their heirs? What evidence do we have that, in general, Warren Buffet may have a point?

In “Inherited Control and Firm Performance, Pérez-González uses the event study technique as

## Class 8 Monday October 2 COMPUTER INVESTIGATION

### ● Research Assignment 2

This assignment is found at the end of the schedule.

*Your work in programming the software, in organizing the output, and in interpreting it should be your own work. Do not borrow from anyone else. Bring it to class to submit. Staple or clip together all pages – no loose pages, please. **Submit it on time.***

well as other measures of performance to assess inherited control as a potential agency problem.

### III. Separation of Ownership and Control as an Optimal Architecture

While Smith, Berle and Means, and Jensen and Meckling worried about the separation of ownership and management, Eugene Fama and Michael Jensen have contended that this separation can constitute an optimal ownership structure that resolves agency problems and achieves the benefits of specialization of management and risk-bearing. James Brickley and his co-authors investigate the ownership structure of the banking industry and draw some interesting conclusions about its future direction in the United States.<sup>1</sup>

## Class 9 Wednesday Oct 4

- Eugene F. Fama and M.C. Jensen, 1983, "Separation of Ownership and Control," *Journal of Law and Economics* 26, 301-325. (available at the online reserve)..

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<sup>1</sup>Their description of how small banks generate and process information is made by Federal Reserve Chairman Ben Bernanke in a speech at the Independent Community Bankers of America National Convention, San Diego, California, March 23, 2011: "Community bankers live and work where they do business, and their institutions have deep roots, sometimes established over several generations. They know their customers and the local economy. Relationship banking is therefore at the core of community banking. The largest banks typically rely heavily on statistical models to assess borrowers' capital, collateral, and capacity to repay, and those approaches can add value, but banks whose headquarters and key decisionmakers are hundreds or thousands of miles away inevitably lack the in-depth local knowledge that community banks use to assess character and conditions when making credit decisions. This advantage for community banks is fundamental to their effectiveness and cannot be matched by models or algorithms, no matter how sophisticated." They argue that differences in ownership structure of small and large banks accounts for this difference in how information is generated and evaluated.

### Class 10 Monday Oct 9 COMPUTER INVESTIGATION

#### ● **Research Assignment 3**

This assignment is found at the end of the schedule.

*You may work together in programming the software, but you may not work together in organizing the output and interpreting it. The output and discussion should be your own work.*

Submit a hard copy in class – *on time*.

## **IV. Internal Sources of Discipline**

### **A. Board of Directors**

Benjamin E. Hermalin and Michael S. Weisbach have asked why there are boards of directors (see below). They note that boards predate governmental regulations requiring such boards, that boards exist in one form or another all over the world, and that for-profit and not-for-profit

### Class 11 Wednesday Oct 11

- James A. Brickley, James S. Linck, and Clifford W. Smith, Jr., 2003, "Boundaries of the Firm: Evidence from the Banking Industry," *Journal of Financial Economics* 70, 351-383. (available at the online reserve)

firms as well as mutuals and cooperatives have boards. They suggest that ". . . boards are a market solution to an organizational design problem, an endogenously determined institution that helps ameliorate the agency problems that plague any large organization. Whatever their virtues or problems, boards of directors are part of the market solution to the contracting problems inside most organizations."

### Class 12 Monday Oct 16

- (Optional) Background: Monks and Minow, Chapter 3, "Directors: Monitoring," (3rd ed.: 195-230; 4th ed: 224-246 (skim it)).
- Benjamin E. Hermalin and Michael S. Weisbach, 2003, "Boards of Directors as an Endogenously Determined Institution: A Survey of the Economic Literature," New York Federal Reserve Bank, *Economic Policy Review* 9, 7-26 (available at the online reserve)

### **B. Managerial Compensation: Pay-Performance Sensitivity**

The board of directors can structure managerial compensation contracts so that they ameliorate

agency conflicts between managers and outside stakeholders. However, boards themselves may have agency conflicts and fail to put the optimal compensation structure in place. Brian J.

### Class 13 Wednesday Oct 18

- Brian J. Hall and Jeffrey B. Liebman, 1998, "Are CEOs Really Paid Like Bureaucrats?" *Quarterly Journal of Economics* 113, 653-691 (available at the online reserve)

Hall and Jeffrey B. Liebman consider the extent to which CEO compensation responds to the firm's performance. John E. Core, Robert W. Holthausen, and David F. Larcker find that CEOs of firms with weaker governance structures earn higher compensation and that their firms perform worse than those with stronger governance.

### Class 14 Monday Oct 23

- John E. Core, Robert W. Holthausen, and David F. Larcker, 1999, "Corporate Governance, Chief Executive Officer Compensation, and Firm Performance," *Journal of Financial Economics* 51, 371-406 (available at the online reserve)

## C. Capital Structure

The proportion of debt relative to equity used to finance a firm creates a complex set of managerial incentives. Michael C. Jensen has emphasized the discipline debt imposes on managers: the higher the proportion of debt to equity, the greater the interest expense the firm incurs and the greater the revenues managers must generate to service the debt and to avoid bankruptcy – hence, the greater the performance pressure on managers and the less likely they

### Class 15 Wednesday Oct 25

- Michael C. Jensen, 1986, "Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers," Introduction and Sections I and II, *American Economic Review* 76, 323-329.
- John J. McConnell and Henri Servaes, 1995, "Equity Ownership and the Two Faces of Debt," *Journal of Financial Economics* 39, 131-157.

are to waste their firm's potential value. Philip G. Berger, Eli Ofek, and David L. Yermack provide evidence supporting Jensen's free-cash-flow hypothesis and show that factors that threaten managerial control are associated with higher levels of debt to equity.

- Philip G. Berger, Eli Ofek, and David L. Yermack, 1997, "Managerial Entrenchment and Capital Structure Decisions," *Journal of Finance* 52, 1411-1438 (optional)

## VII. External Sources of Discipline

### A. Holders of Large Debt and Equity Stakes

Shareholders whose stake in the firm is small have no incentive to monitor managers' performance – the free-rider problem. Whose stake in the firm's performance is large enough to give them an economic incentive to become informed and to discipline managers? Outside holders of large blocks of stock and debt have enough to gain or lose to pay attention.

#### Class 16 Monday Oct 30 COMPUTER INVESTIGATION

- **Read before class:** Clifford G. Holderness, 2003, "A Survey of Blockholders and Corporate Control," Federal Reserve Bank of New York, *Economic Policy Review* 9, 51-64 (available at the online reserve)
- During class, we shall work on **Research Assignment 4**, which shall be due at the end of class. If you cannot attend class, complete the assignment in advance and leave a hard copy in 202 New Jersey Hall.

- Background: Monks and Minow, Chapter 2, "Shareholders: Ownership," (3rd ed.: 129-187; 4th ed.: 132-214 (skim it))

#### Class 17 Wednesday Nov 1

- Luc Laeven and Ross Levine, 2009, "Bank Governance, Regulation and Risk Taking," *Journal of Financial Economics* 93, 259-275.

### B. Managerial Labor Markets

Eugene Fama has contended that managerial labor markets accurately distinguish inefficient managers and punish them. If he is correct, labor markets play an important role in market

#### Class 18 Monday Nov 6

- Albert A. Cannella, Jr., Donald R. Fraser, and D. Scott Lee, 1995, "Firm Failure and Managerial Labor Markets: Evidence from Texas Banking," *Journal of Financial Economics* 38, 185-210 (available at the online reserve)

discipline. Albert A. Cannella, Jr., Donald R. Fraser, and D. Scott Lee have obtained evidence supporting Fama's hypothesis by considering the re-employment experience of managers of banks that fail. In contrast to the evidence of labor market efficiency that these authors have

found, the evidence obtained by two papers that examined the effect on firms' value of the sudden death of a CEO and of family succession suggests that managerial entrenchment can undermine the working of labor market discipline.

- Eugene F. Fama, 1980, "Agency Problems and the Theory of the Firm," *Journal of Political Economy* 88, 288-325 (optional)
- W. Bruce Johnson, Robert Magee, Nandu Nagarajan, and Harry Newman, 1985, "An Analysis of the Stock Price Reaction to Sudden Executive Deaths: Implications for the Management Labor Market," *Journal of Accounting and Economics* 7, 151-174 (optional)
- Francisco Pérez-González, 2006, "Inherited Control and Firm Performance," *American Economic Review* 96: 5, 1559-1588 (assigned above)

### **C. Product Markets**

John Hicks famously noted, "The best of all monopoly profits is a quiet life" (*Econometrica*, 1935, 8). Is it really? Does a firm with market power whose managers pursue a quiet life suggest that there are agency problems between managers and outside owners? Aren't there disciplining mechanisms other than product-market discipline to minimize such a problem? The following papers consider these questions.

- Stephen J. Nickell, 1996 "Competition and Corporate Performance," *Journal of Political Economy* 104, 724-746, especially 724-30 (optional)

#### **Class 19 Wednesday Nov 8**

- Allen N. Berger and Timothy H. Hannan, 1998, "The Efficiency Cost of Market Power in the Banking Industry: A Test of the 'Quiet Life' and Related Hypotheses," *Review of Economics and Statistics* 80, 454-465. Read sections I-IV. (available at the online reserve)

#### **Class 20 Monday Nov 13**

- Mitchell A. Petersen and Raghuram G. Rajan, 1995, "The Effect of Credit Market Competition on Lending Relationships," *Quarterly Journal of Economics* 110, Introduction and Sections II and III, 407-443 (available on Sakai).

### **D. Capital Markets**

Mary Schranz has observed (see below, 299), "In theory, one of the major benefits of corporate

takeovers is that the threat of a takeover provides management with the incentive to maximize firm value. If management does not maximize shareholder wealth, another economic agent may acquire control of the company, replace management, and reap the gains from a more efficient firm." However, a number of studies have documented that factors that contribute to managerial entrenchment can limit the effectiveness of capital-market discipline.

- Henry G. Manne, 1965, "Mergers and the Market for Corporate Control," *Journal of Political Economy* 73, 110-120 (optional)
- James A. Brickley and Christopher M. James, 1987, "The Takeover Market, Corporate Board Composition, and Ownership Structure: The Case of Banking," *Journal of Law and Economics* 30, 161-180 (optional)

#### Class 21 Wednesday Nov 15

- Yaron Brook, Robert Hendershott, and Darrell Lee, 1998, "The Gains from Takeover Deregulation: Evidence from the End of Interstate Banking Restrictions," *Journal of Finance* 53, 2185-2204. (available at the online reserve)

#### Class 22 Monday Nov 20

- Joseph P. Hughes, William Lang Loretta Mester, Choon-Geol Moon, and Michael Pagano, 2003, "Do Bankers Sacrifice Value to Build Empires? Managerial Incentives, Industry Consolidation, and Financial Performance," *Journal of Banking and Finance* 27, 417-447. (available at the online reserve)

- Mary S. Schranz, 1993, "Takeovers Improve Firm Performance: Evidence from the Banking Industry," *Journal of Political Economy* 101, 299-326 (optional)
- Larry H. P. Lang, René Stulz, and Ralph A. Walking, 1989, "Managerial Performance, Tobin's Q, and the Gains from Successful Tender Offers," *Journal of Financial Economics* 24, 137-154. (see extension by Henri Servaes, 1991, "Tobin's Q and the Gains from Takeovers," *Journal of Finance* 66, 409-419) (optional)
- Evanoff, Douglas, and Evren Örs, 2002, "Local Market Consolidation and Bank Productive Efficiency," Federal Reserve Bank of Chicago Working Paper 2002-25 (optional)

#### Class 23 Monday Nov 27 COMPUTER INVESTIGATION

- **Research Assignment 5.** *Your work in programming the software, in organizing the output, and in interpreting it should be your own work. Do not borrow from anyone else. Bring it to class to submit. Staple or clip together all pages – no loose pages, please. Submit it on time.*

## VIII. Governance of Not-for-Profit Organizations

Not-for-profit firms do not have owners and, hence, do not distribute their net revenues (profits) to such owners. Donors to these organizations do not receive net revenues nor do they have explicit control rights. On the other hand, the board of directors does have control rights, and major donors often belong to the board. However, the board is not formally accountable to donors (or any sort of stakeholders). Edward L. Glaeser notes (see below), “Many factors including incentive-pay, powerful shareholders, and takeover threats push for-profit managers towards maximizing shareholder value. One of the most striking factors about non-profit firms is that they have no comparable governance institutions, and the only check on managers are boards that are themselves rarely responsible to anyone outside the firm. . . . A primary implication is that non-profits will often evolve into organizations that resemble workers’ cooperatives. The primary check on this tendency is the need of the organization to compete in outside markets.”

### Class 24 Wednesday Nov 29

- Edward L. Glaeser, 2002, “The Governance of Not-for-Profit Firms,” sections I and III, National Bureau of Economic Research, Working Paper 8921, pp. 2-9 (available at the online reserve)
- John E. Core, Wayne R. Guay, and Rodrigo Verdi, 2006, “Agency Problems of Excess Endowment Holdings in Not-for-Profit Firms,” *Journal of Accounting and Economics* 41, 307-333. (available at the online reserve)

### Class 25 Monday Dec 4

- Sheila Ramachandra, “Higher Education and Non-Profit Governance: The Role of Endowments,” Rutgers Honors Research Thesis, 2008 (available at Sakai)

### Class 26 Wednesday Dec 6

- Jason Tilipman, “The Role of Endowments in Non-Profit Higher Education Institutions,” Rutgers Honors Research Thesis, 2013 (available at Sakai)

**Class 27 Monday Dec 11 COMPUTER INVESTIGATION**

● **Research Assignment 6.** *Your work in programming the software, in organizing the output, and in interpreting it should be your own work. Do not borrow from anyone else. Bring it to class to submit. Staple or clip together all pages – no loose pages, please. **Submit it on time.***

**Class 28 Wednesday Dec 13**

● **Review for Exam**

# RESEARCH ASSIGNMENT 1

*Your work in programming the software, in organizing the output, and in interpreting it should be your own work. Do not borrow from anyone else.* Bring it to class to submit. Staple or clip together all pages – no loose pages, please. **Submit it on time. This assignment counts as a quiz. Consequently, there are no late submissions or make-ups.**

The data used in this assignment are described in *Investigating Market Discipline: US Bank Holding Company Data*. You should read this documentation before working on the assignment. To complete this assignment, use the econometrics software, SAS, found in the other university computer labs and on apps.rutgers.edu. Instructions for using SAS to complete this exercise are found in the document, *Using SAS to Investigate Market Discipline*, which is posted on the Sakai website for this course. You can also find the SAS data file required to complete the assignment in this location. **Save your SAS program (code) and attach it as an appendix to the assignment.**

1. Divide the sample of 169 banks into two groups based on the median value of the asset size variable (*ba9412*). Since there are 169 observations, one of the groups will contain 85 observations. Put the extra observation in the smaller subsample. First, compute the summary statistics for asset size to determine the values of the median sized bank. (Don't forget that *ba9412* is measured in thousands so that 1,000,000 is given by  $ba9412=1,000$ .)

A. For the full sample and for the larger and smaller subsamples, compute the means, medians, standard deviation, and maximum and minimum values of asset size (*ba9412*), managerial ownership (*mown*), outside blockholder ownership (*osblock*), the index of market power (*herf*), the capital-to-assets ratio (*ca\_ratio*), Tobin's *q* ratio (*q\_ratio*), the market-value inefficiency ratio (*in\_ratio*), the relative value of the bank's investment opportunities (*io\_ratio*), the ratio of nonperforming loans to total assets (*np\_ratio*), and the number of states in which the bank operates (*numst*). Show your SAS program (code).

B. Paste the SAS output tables into your essay and give the tables a heading that explains their content – including the definitions of the variables. The tables should be self-explanatory.

C. Compare the means of these variables for the two groups. Are the differences statistically significant at the .10 level or better? Show your test results and refer to them to explain how you reached your conclusion each of the variables. In the table in 1B, highlight in bold all means whose differences are significantly different from zero and explain in the table headings.

**Number your responses to these parts 1A, 1B, and 1C.**

2. Give the formal definition of Tobin's *q* ratio and explain how it is commonly measured (that is, what are the empirical proxies for its numerator and denominator of the formal definition)?

A. Consider a firm that has assets whose book value is 100, liabilities whose book value is 80, and equity whose market value is 30. The market value of a firm's assets is not usually directly observed. However, there is a commonly used approximation (empirical proxy) for this market value. Use it to determine the (approximate) market value of this firm's assets? Show your calculations.

B. Calculate the commonly used proxy for Tobin's q ratio. Show your calculations.

C. Suppose stochastic frontier analysis shows that the best-practice (highest potential value) value of this firm's assets is 130. What is its market-value inefficiency ratio (*in\_ratio*)? Show your calculations.

**Number your responses to these parts 2A, 2B, and 2C.**

3. Explain how the market-power index is computed. Illustrate its computation for the case of a market where there are five banks with the following market shares: .50, .20, .15, .10, and .05. Show your calculations.

**Number your response 3.**

4. What is meant by outside blockholder ownership (*osblock*)? What is meant by insider ownership (*mown*)?

**Number your response 4.**

5. We could further partition the full sample into quartiles (dividing the halves above into two partitions of equal numbers of observations). Because there are many small banks and few very large banks, dividing the sample by quartiles results in three quartiles with relatively small banks and a fourth quartile with a mix of very large banks and moderately sized banks. To isolate large and very large banks, divide the sample into four groups based on  $ba9412 < 1,500,000$  (1.5 billion—remember the definition of this variable),  $1,500,000 \leq ba9412 < 10,000,000$  (1.5 billion to 10 billion),  $10,000,000 \leq ba9412 < 50,000,000$ , and  $ba9412 \geq 50,000,000$ .

A. For each subsample, compute the means, medians, standard deviation, and maximum and minimum values of *ba9412*, *mown*, *osblock*, *herf*, *ca\_ratio*, *q\_ratio*, *in\_ratio*, *io\_ratio*, *np\_ratio*, *numst*, and *sumbrnch*.

B. Paste your SAS output tables into your essay and give the tables a heading that explains their content – including the definitions of the variables. The tables should be self-explanatory.

**Number your responses to these parts 5A-B.**

C. Discuss any patterns you observe over the four size groups in the means of the variables listed below. In discussing the patterns, give specifics: for example, "the mean variable increased from 0.XX in the smallest group to 0.YY in the largest."

- A. investment-opportunity ratio
- B.  $q$  ratio
- C. market-value inefficiency
- D. insider ownership

**Number your response 5C.**

6. How large is the largest bank? Give the value in the data set and the "actual" value. What is the name of the largest bank? Show how you programmed SAS to produce the name of this bank.

**Number your response 6.**

**Remember: Save your SAS program (code) and attach it as an appendix to the assignment.**

## RESEARCH ASSIGNMENT 2

*Your work in programming the software, in organizing the output, and in interpreting it should be your own work. Do not borrow from anyone else.* Bring it to class to submit. Staple or clip together all pages – no loose pages, please. **Submit it on time This assignment counts as a quiz. Consequently, there are no late submissions or make-ups.**

1. Divide the sample at the median level of market-value inefficiency (*in\_ratio*) into the more efficient half and the less efficient half of the sample. Put the median value into the more efficient half so it has 85 observations. Compute the number of observations, means, medians, standard deviation, and maximum and minimum values in the full sample and in the two subsamples of the variables. For each subsample, compute the number of observations, means, medians, standard deviation, and maximum and minimum values of *ba9412*, *mown*, *osblock*, *herf*, *ca\_ratio*, *q\_ratio*, *in\_ratio*, *io\_ratio*, *np\_ratio*, *numst*, and *sumbrnch*. Show your output in tables that allow easy comparison of the means in the full sample and in these two efficiency subsamples. Give the tables a heading that explains their contents – including the definitions of the variables. The tables should be self-explanatory.

**Number your answer 1 and put the output above in the answer, not in an appendix.**

2. For all the variables above, compute whether the differences in their means between the more and less efficient halves of the sample are statistically significant (at the .10 level or better). Show your test results and explain how you reached your conclusion for each of the variables. Explain your logic carefully.

To carry out these tests of differences and to explain your logic clearly, you may want to consult the following resource: <http://www.ats.ucla.edu/stat/sas/output/ttest.htm>. The discussion under the heading, “Independent group t-test,” explains how to interpret the output of `proc ttest` when comparing means.

In the tables, embolden the values of means that are significantly different from each other and explain the meaning of the bold values in the table heading.

**Number your answer 2 and put the output above in the answer, not in an appendix.**

3. Do you see any interesting differences in means between the more and less efficient halves? Explain carefully. Be specific when discussing the values of variables. No credit will be given for a sketchy answer.

**Remember: Save your SAS program (code) and attach it as an appendix to the assignment.**

## RESEARCH ASSIGNMENT 3

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1. Consider the relationship between performance and insider ownership. Construct tables showing means in the full sample and in the three insider ownership groups defined by Morck, Shleifer, and Vishny for the variables *ba9412*, *mown*, *osblock*, *herf*, *ca\_ratio*, *q\_ratio*, *in\_ratio*, *io\_ratio*, *np\_ratio*, *numst*, *sumbrnch*.

The mean market-value inefficiency ratio increases from the subsample with the lowest insider ownership to the one with the highest insider ownership. Review what happens as well to the means of blockholder ownership, the investment opportunity ratio, and bank asset size.

2. What factors besides insider ownership might explain the increasing mean inefficiency as insider ownership increases.

3. While these univariate comparisons suggest an interesting relationship of performance and managerial ownership, they do not control for other factors that might influence managerial performance. Multivariate regression analysis permits a controlled investigation of the relationship of firm performance and insider ownership. Regress market-value inefficiency (*in\_ratio*) on *mown*, *mown*<sup>2</sup>, and the log of size (*ba9412*). You will need to create two new variables, *lnba9412*, which is the natural log of total assets, and *mown*<sup>2</sup>.

A. What does the estimate of the regression coefficient on size mean? Is it statistically significant?

B. Compute the derivative of inefficiency with respect to *mown*.

C. What is the value of the derivative you computed in B at *mown* = 0.10? at *mown* = 0.30? In each case, interpret the sign you obtain in terms of the *interpretive* framework of Morck, Shleifer, and Vishny. How would they interpret the signs you obtain for these derivatives?

D. Use the “test” statement in “proc reg” (see *Investigating Market Discipline Using SAS*) to test the statistical significance of the derivative computed in B at *mown* = 0.01, *mown* = 0.10, and *mown* = 0.30. Show the output of this test and interpret its meaning in terms of the significance of the derivatives.

E. Compute the value of insider ownership where the derivative of inefficiency with respect to *mown* equals zero. *Show your work*. What is the economic interpretation of this value? Explain carefully.

F. Why include  $mown^2$  among the explanatory variables?

G. Does this evidence on the relationship of bank performance and insider ownership agree with that of the papers previously assigned?

H. Some of the previously assigned papers used in their regressions a piece-wise linear specification of insider ownership which consisted of three components to allow for three “regimes” defined by the empirical relationship between performance and insider ownership. The regression specified above allows for only two regimes since insider ownership is specified only up to its squared value. Allow for three regimes by including cubic term,  $mown^3$ . Hence, regress  $in\_ratio$  on  $mown$ ,  $mown^2$ ,  $mown^3$ , and the log of size (*ba9412*).

(1). Use the “test” statement in “proc reg” (see *Investigating Market Discipline Using SAS*) to test the statistical significance of the derivative of  $in\_ratio$  with respect to  $mown$  at  $mown = 0.01$ ,  $mown = 0.10$ , and  $mown = 0.30$ . Show the output of this test and interpret its meaning in terms of the significance of the derivative.

(2). Compute the two values of insider ownership where the derivative of inefficiency with respect to  $mown$  equals zero. You may choose to use <http://www.1728.com/quadratc.htm> to calculate your answers.

(3). What more have you learned about the relationship between inefficiency and insider ownership from this specification?

I. Are there other variables in addition to asset size that might be appropriate control variables in this regression? Explain the logic supporting each variable you propose to include as a control variable. Run a new regression that includes your conjecture and interpret the results.

**Remember: Save your SAS program (code) and attach it as an appendix to the assignment.**

## RESEARCH ASSIGNMENT 4

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1. What is the definition of the variable, *osblock*, outside blockholder ownership?
2. Divide the sample into two groups: banks with outside blockholders and banks without outside blockholders. Compute summary statistics for these groups for the following variables: *ba9412*, *mown*, *osblock*, *herf*, *ca\_ratio*, *q\_ratio*, *in\_ratio*, *io\_ratio*, *np\_ratio*, *numst*, *sumbrnch*, *isqrvaru*, *aqasset*, *soasset*, *naqs*, and *nsubs*.
3. Test the hypothesis that the means of these variables are equal for the two groups. Show your output.
4. Discuss the differences in means that you find between the two groups and, to the extent you can, relate these differences to hypotheses advanced in the scholarly literature about the effects of outside blockholders on firms' performance. In particular, are any of the statistically significant differences in means consistent with any of these hypotheses? Highlight the means with significant differences in bold in your table.
5. While these univariate comparisons suggest an interesting role for outside blockholders in disciplining managers, they do not control for other factors that might influence managerial performance. Multivariate regression analysis permits a controlled investigation of the relationship of outside blockholders to firm performance.
  - A. Regress Tobin's *q* ratio and the measure of market-value inefficiency, *in\_ratio*, on *osblock* and  $\ln(ba9412)$ . What do these regressions tell you about outside blockholders? Do the two regressions agree?
  - B. Regress Tobin's *q* ratio and the measure of market-value inefficiency, *in\_ratio*, on *osblock*,  $(osblock)^2$ , and  $\ln(ba9412)$ . What do these regressions tell you about outside blockholders? Do they agree? Compare them with the previous two.
  - C. Use the *in\_ratio* regression coefficients in (B) to compute the derivative of *in\_ratio* with respect to *osblock*.
    - (1) Evaluate this derivative at the mean value of *osblock* for the subsample where the value of blockholders is positive. Show your calculations. What is the economic interpretation of the sign of this derivative?

(2) Compute the value of *osblock* where this derivative equals zero. What does this value tell you?

(3) Is the estimated value of this derivative, evaluated at the mean value of *osblock* for the subsample with positive *osblock*, significantly different from zero?

(a) Show the programming of the *proc reg* statement you used to compute the statistical significance of this derivative evaluated at the mean.

(b) Show the output of this test and interpret its meaning in terms of the significance of the derivative.

(4) Are there other variables in addition to asset size that might be appropriate control variables in this regression? Explain the logic supporting each variable you propose to include as a control variable. Run a new regression that incorporates your thoughts on this matter.

**Remember: Save your SAS program (code) and attach it as an appendix to the assignment.**

## RESEARCH ASSIGNMENT 5

Your work in programming the software, in organizing the output, and in interpreting it should be your own work. Do not borrow from anyone else. Bring it to class to submit. Staple or clip together all pages – no loose pages, please. **Submit it on time. This assignment counts as a quiz. Consequently, there are no late submissions or make-ups.**

1. Allen Berger and Timothy Hannan in “The Efficiency Cost of Market Power in the Banking Industry: A Test of the ‘Quiet Life’ and Related Hypotheses” (*Review of Economics and Statistics* 80, 1998, 454-465) describe the Justice Department’s classification of market concentration using the Herfindahl Index (p. 461): a market where  $herf \leq 0.10$  is “unconcentrated;” where  $0.10 < herf \leq 0.18$  is “moderately concentrated; and where  $herf > 0.18$  is “highly concentrated.”

A. Write the formula that defines  $herf$ . What is the value of  $herf$  when a market consists of three firms holding shares .33, .33, and .33 of the market? Holding .80, .10, and .10? And consisting of ten firms each with a share .10 of the market? Show your calculations.

B. Divide the sample into five groups where  $herf \leq 0.10$ ,  $0.10 < herf \leq 0.18$ ,  $0.18 < herf \leq 0.28$ ,  $0.28 < herf \leq 0.38$ , and  $herf > 0.38$ . For each sub-sample, compute the summary statistics for the following variables:  $ba9412$ ,  $mown$ ,  $osblock$ ,  $herf$ ,  $ca\_ratio$ ,  $q\_ratio$ ,  $in\_ratio$ ,  $io\_ratio$ ,  $np\_ratio$ ,  $numst$ ,  $sumbrnch$ ,  $isqrovaru$ ,  $aqasset$ ,  $soasset$ ,  $naqs$ , and  $nsubs$ .

C. How does market-value inefficiency vary over these sub-samples as market power increases? Is this pattern consistent with the “quiet life” hypothesis?

D. How does insider ownership vary over these sub-samples as market power increases?

E. How does the size of the bank vary over these sub-samples as market power increases?

F. What factors other than market power might explain the pattern of inefficiency that is exhibited across the sub-samples from lower to higher concentration?

2. Investigate the role of market concentration in explaining managerial performance by using regression analysis.

A. Regress Tobin’s  $q$  ratio and the measure of market-value inefficiency,  $in\_ratio$ , on  $herf$  and  $\ln(ba9412)$ . What do these regressions tell you about market concentration and the “quiet life” hypothesis? Do the two regressions agree?

B. Define the  $io\_ratio$ , and describe how it is estimated. Should you control for the value of a firm’s investment opportunities ( $io\_ratio$ ) when investigating how market concentration influences inefficiency measured in terms of market value? Explain.

C. Regress the measure of market-value inefficiency on  $herf$ ,  $io\_ratio$ , and  $\ln(ba9412)$ . What does the estimate of the coefficient on the  $io\_ratio$  tell you?

D. Should you allow for a non-linear, perhaps non-monotonic relationship between inefficiency and market concentration? Why? (hint: see part 1)

E. Regress the measure of market-value inefficiency on  $herf$ ,  $herf^2$ ,  $io\_ratio$ , and  $\ln(ba9412)$ . What do the coefficient estimates on  $herf$  and  $herf^2$  tell you about the relationship of inefficiency to market concentration?

F. Compute the derivative of inefficiency with respect to  $herf$ . At what value of  $herf$  is this derivative equal to zero? What is the economic significance of this value – that is, the economic interpretation?

How many observations have a value of  $herf$  that equals or exceeds the value of  $herf$  at which the derivative in F above equals zero? Show your programming that you used to determine this number of observations.

G. Does market power – an absence of product market discipline – guarantee a firm's managers the "quiet life" – i.e., the ability to increase their consumption of agency goods?

H. Consider how you might explain the negative relationship between inefficiency and market concentration. To do so, go to the Sakai website and read at least pages 407-408 of the paper, Mitchell A. Petersen and Raghuram G. Rajan, 1995, "The Effect of Credit Market Competition on Lending Relationships," *Quarterly Journal of Economics*, 110, 407-443. Are any of the hypotheses advanced by Petersen and Rajan consistent with this negative relationship? Explain carefully.

**Remember: Save your SAS program (code) and attach it as an appendix to the assignment.**

## RESEARCH ASSIGNMENT 6

1. All work on this assignment should be yours alone.
2. Do not work with others on the answers, econometrics, or programming.
3. Save your SAS program (code) and attach it as an appendix to the assignment.
4. Staple or clip together all pages – no loose pages, please.
5. Submit it on time This assignment counts as a quiz. Consequently, there are no late submissions or make-ups.

### The Background

The standard intermediate micro text usually notes that competition in product markets creates a powerful incentive for a firm's managers to operate efficiently. In long-run equilibrium with free entry and exit, firms in a competitive industry earn only the return required by its owners (zero economic profit). Thus, inefficient managers fail to produce the required return. Such firms, it is said, do not survive in the long run. According to Hicks' "quiet-life" hypothesis, the managers of a firm operating as a monopoly in its product market may face less pressure to perform when they earn profits in excess of the return required by their firm's owners (positive economic profit). Nevertheless, the standard theory of monopoly assumes that managers maximize profit. Apparently, the pleasures of the "quiet life" are not that attractive (in theory).

### The Investigation

I. List as many reasons as you can why managers of a monopoly may reject the "quiet life" and perform efficiently. For each reason, provide a sentence of two that gives some details of the incentives it provides managers to maximize firm value.

II. For those reasons in part I for which you have data to construct proxies for them, formulate an econometric investigation of their association with firm performance measured by the market-value inefficiency ratio (*in\_ratio*).

A. List each reason for which you have data and give the variable you are using as its proxy in the econometric investigation. Give the variable's empirical definition.

B. List any other variables you have included as control variables, and explain why you have included each one. Give the variable's empirical definition.

C. Give your specification of the performance equation you intend to estimate (using *in\_ratio* as the proxy for performance). If you have chosen any right-hand-side arguments that are squared terms or interactions of variables, explain your logic for doing so.

D. Provide the complete results (all the regression output) of your estimation.

E. Interpret the results you obtain. Focus on the degree to which they are consistent (or inconsistent) with the incentives to maximize firm value that you identified in part I. Compare your results with any well known results obtained by others in published papers you have read.

F. In an appendix, include your SAS program which produced your output (and any unreported results).

**Remember: Save your SAS program (code) and attach it as an appendix to the assignment.**