Market Discipline
Economics 408
Fall 2013
Professor J. P. Hughes
Office Hours Mon. 10:15 - 11:45, Wed. 11:15 - 11:45/ NJ Hall 420
JPHUGHES@RCII.RUTGERS.EDU

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

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.

Background: The separation of management from ownership plus the outside owners’ lack of information about how a firm’s managers run the firm give managers discretion to pursue objectives that reduce the market value of their firm. These objectives include consuming perquisites, avoiding effort, building empires, discriminating prejudicially, making incompetent investment and production decisions, and taking too much or too little risk to protect their control over the firm’s assets.

As Adam Smith noted in the Wealth of Nations, “The directors of such companies, however, being the managers rather of other people’s money than their own, it cannot well be expected, that they should watch over it with the same anxious vigilance with which the partners in a private company frequently watch over their own. Like stewards of a rich man, they are apt to consider attention to small matters as not for their master’s honour, and very easily give themselves dispensation from having it. Negligence and profusion, therefore, must always prevail, more or less, in the management of the affairs of such a company.”

The enduring success of the corporate form of business organization stands in contrast to Adam Smith’s pessimism. Is it possible that the Invisible Hand of markets disciplines managers tempted by negligence and profusion (extravagance)?

- Do product markets punish bad managers with weak demand for their products?
- Does weak performance that causes a firm’s market value to fall below its potential value attract the attention of outsiders who try to take over the firm or to purchase a sufficiently large block of shares that they acquire the power to replace bad management and increase the firm’s value?
- Does a firm’s weak performance erode the reputation of its managers and reduce their ability to compete in managerial labor markets?
- Does the board of directors pay attention to the potential for negligence and profusion – perhaps by basing managerial compensation on performance and, if necessary, replacing bad managers? Do managers find ways to evade these disciplinary mechanisms – to entrench themselves – and, in doing so, enhance their ability to pursue personal objectives at the expense of outside stakeholders?
- Do similar disciplinary mechanisms reduce negligence and profusion at not-for-profit firms, mutuals, and cooperatives?

How, then, do markets succeed and fail, more or less, at disciplining agents tempted by negligence and profusion?

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.”
**Pedagogy:** The course will be run as a seminar where a research paper is read in advance of class and discussed in class. The discussion will consider why the paper’s topic is of interest to economists and what it contributes to our understanding of the topic, in addition to such details as the economic model used in the study, the hypotheses tested, the econometric methods and data employed in the tests, and the paper’s empirical findings. After considering several papers on the same topic, the discussion will turn to broader questions comparing the studies’ methods and findings. When their findings agree, what is the economic significance of this consensus?

Using data on U. S. commercial banks, students will apply econometric analysis to address some of the same questions considered by the published papers discussed in class. With econometric probing, these data will reveal fascinating relationships between firm performance and the proportion of the firm owned by its managers and owned by outside blockholders. They also provide insight in the role of market competition in disciplining managerial performance. And, they suggest that managers who can resist market discipline build “empires” by making value-sacrificing acquisitions of other banks.

**Basis of Evaluation:** The course grade will be determined by econometrics assignments and quizzes, which shall determine 75 percent of the final grade, and by a final examination (Wednesday, Dec. 18, 9-11 AM – note the later starting time), which shall determine the remaining 25 percent of the final grade. In lieu of make-ups, the lowest grade will be dropped. Quizzes and econometrics assignments each count equally. Students are expected to attend all classes. If you expect to miss one or two classes because of illness or a family emergency, please use the University absence reporting website https://sims.rutgers.edu/ssra/ to indicate the date and reason for your absence. An email is automatically sent to me.

**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

---

**Class 1**

Bring to class your written answers the following questions. (Consult your micro text.) Skim the background readings for issues of interest and for future reference.

- A. Describe the theory of profit maximization. Use graphs to illustrate the theory. What does this theory assume about the cost of producing the firm’s output?
- B. In the theory of profit maximization, are managers efficient? What is meant by efficiency in this theory?
- C. Who owns the firm — the management or outsiders? Does it matter in this theory — why not?

is publicly sold. The ownership stake of the firm’s managers can range from the entire firm to none of the firm. How does the degree of concentration of ownership and the ownership 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

First, complete the Jensen-Meckling Utility Maximization Problem. Then skim the classic treatment of the theory of the firm (illustrated by the problem) where there is a separation of ownership from management and outside owners can monitor management only at a cost (imperfect monitoring). Stick with it: the problem should clarify the reading.


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 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.

Class 3

A. Implementing the Jensen-Meckling Definition of 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


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 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?

Class 5

- Data 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.

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

Class 7

Data 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.**

---

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

---

Class 8


---

Class 9

Data 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.

---

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.¹

Class 10


Class 11


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 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


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

¹Their 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 these 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.
have agency conflicts and fail to put the optimal compensation structure in place. Brian J. 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 13

Class 14

Class 15


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 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.

Class 16
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 17

Class 18
- Data Assignment 4. 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 19

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 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 managerialentrenchment can undermine the working of labor market discipline.

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.


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.


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.”
<table>
<thead>
<tr>
<th><strong>Class 27</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Data Assignment 6.</strong> Your work on this assignment should be entirely yours. Do not work together on any part of this assignment. Submit a hard copy in class.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Class 28</strong></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>Class 29</strong></th>
</tr>
</thead>
</table>
DATA 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. If you cannot attend class, submit it to Sakai no later than the start of the class at which it is due.**

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 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 these additional variables: numst, sumbrnch, isqvaru, aqasset, soasset, naqs, nsubs. Show your SAS program.

   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.

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.

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.

4. What is meant by outside blockholder ownership (osblock)? What is meant by insider ownership (mown)?
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 $ba9412$, $mown$, $osblock$, $herf$, $ca_ratio$, $q_ratio$, $in_ratio$, $io_ratio$, $np_ratio$, $numst$, $sumbrnch$, $isqrvr$, $aqasset$, $soasset$, $naqs$, and $nsubs$.

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.

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
E. outside blockholder ownership
F. capital-to-assets ratio
G. market-power index
H. variables dealing with geography, diversification, and branching
I. nonperforming loans ratio

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.

**Remember: Save your SAS program and attach it as an appendix to the assignment.**
DATA 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. If you cannot attend class, submit it to Sakai no later than the start of the class at which it is due.

1. Divide the sample of 169 banks into three ownership groups where (managerial ownership) $mown \leq 0.05$, $0.05 < mown \leq 0.25$, and $mown > 0.25$. Compute the means, medians, standard deviation, and maximum and minimum values in the full sample and in these three groups of the variables, $ba9412$, $mown$, $osblock$, $herf$, $ca\_ratio$, $q\_ratio$, $in\_ratio$, $io\_ratio$, $np\_ratio$, $numst$, $sumbrnch$, $isqrvru$, $aqasset$, $soasset$, $nags$, and $nsubs$. Show your output in tables that allow easy comparison of the means in the full sample and in each of these three ownership subsamples. Give the tables a heading that explains their contents – including the definitions of the variables. The tables should be self-explanatory.

   **A.** How does the mean market-value inefficiency change as insider ownership increases? Be specific: give the values of the means. How does the mean in each group compare with the mean of the full sample? Again, be specific.

   **B.** How does mean ownership by outside blockholders vary over these subsamples as insider ownership increases? How does the mean in each group compare with the mean of the full sample? In all cases, be specific.

   **C.** How does the mean size of the bank vary as insider ownership increases? How does the mean in each group compare with the mean of the full sample? Again, be specific.

2. 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 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 means, medians, standard deviation, and maximum and minimum values of $ba9412$, $mown$, $osblock$, $herf$, $ca\_ratio$, $q\_ratio$, $in\_ratio$, $io\_ratio$, $np\_ratio$, $numst$, $sumbrnch$, $isqrvru$, $aqasset$, $soasset$, $nags$, and $nsubs$. 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.

3. 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](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.

4. 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 and attach it as an appendix to the assignment.
DATA ASSIGNMENT 3

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. If you cannot attend class, submit it to Sakai no later than the start of the class at which it is due.

1. Consider again the relationship between performance and insider ownership investigated in assignment 2. Reproduce the tables showing means in the full sample and in the three insider ownership groups of the variables ba9412, mown, osblock, herf, ca_ratio, q_ratio, in_ratio, io_ratio, np_ratio, numst, sumbrnch, isqrvaru, aqasset, soasset, naqs, and nsubs.

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^2, 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^2.

   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 \( \text{http://www.1728.com/quadratic.htm} \) 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.

\textbf{Remember: Save your SAS program and attach it as an appendix to the assignment.}
DATA ASSIGNMENT 4

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. If you cannot attend class, submit it to Sakai no later than the start of the class at which it is due.

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, isqrvru, 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 and attach it as an appendix to the assignment.
**DATA 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. If you cannot attend class, submit it to Sakai no later than the start of the class at which it is due.*

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 \( \text{herf} \leq 0.10 \) is "unconcentrated;" where \( 0.10 < \text{herf} \leq 0.18 \) is "moderately concentrated;" and where \( \text{herf} > 0.18 \) is "highly concentrated."

A. Write the formula that defines \( \text{herf} \). What is the value of \( \text{herf} \) 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 \( \text{herf} \leq 0.10 \), \( 0.10 < \text{herf} \leq 0.18 \), \( 0.18 < \text{herf} \leq 0.28 \), \( 0.28 < \text{herf} \leq 0.38 \), and \( \text{herf} > 0.38 \). For each sub-sample, compute the summary statistics for the following variables: \( ba9412 \), \( mown \), \( osblock \), \( \text{herf} \), \( ca\_ratio \), \( q\_ratio \), \( in\_ratio \), \( io\_ratio \), \( np\_ratio \), \( numst \), \( sumbrnch \), \( isqvaru \), \( agasset \), \( soasset \), \( naqs \), 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, \( \text{in}\_ratio \), on \( \text{herf} \) 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 \( \text{herf} \), \( io\_ratio \), 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 I)

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

F. Compute the derivative of inefficiency with respect to \( \text{herf} \). At what value of \( \text{herf} \) is this derivative equal to zero? What is the significance of this value?

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?


**Remember: Save your SAS program and attach it as an appendix to the assignment.**
DATA 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 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. If you cannot attend class, submit it to Sakai no later than the start of the class at which it is due.

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 and attach it as an appendix to the assignment.