UNIVERSAL BANKING AND THE
PERFORMANCE OF GERMAN FIRMS

Gary Gorton
Frank A. Schmid

UNIVERSAL BANKING AND THE
PERFORMANCE OF GERMAN FIRMS

ABSTRACT

Universal banking is an alternative mechanism to a stock market for risk-sharing, for providing information for guiding investment, and for contesting corporate governance. In Germany, where the stock market has historically been small, banks hold equity stakes in firms and have proxy voting rights over other agents' shares. In addition, banks lend to firms and have representatives on corporate boards. If a banking relationship is a substitute for the stock market, then interaction with a bank should improve the performance of firms. But, if banks have private information about firms that they lend to and have monopolistic control over access to external capital markets, then bank interests may conflict with those of other equityholders, especially those whose shares are voted by the banks in proxy. We empirically investigate the influence of banks on the performance of German firms taking account of banks' equity holdings, the extent of banks' proxy voting rights, and the ownership structure of the firms' equity. We test for conflicts-of-interest in bank behavior and ask whether the relationship between banks and firms has changed between the 1970s and 1980s.

Gary Gorton
Wharton School
University of Pennsylvania
3620 Locust Walk
Philadelphia, PA 19105
and NBER

Frank A. Schmid
Wharton Financial Institutions Center
University of Pennsylvania
3620 Locust Walk
Philadelphia, PA 19104

I. Introduction

Stock markets are widely viewed as important, if not essential, for the functioning of modern capitalist economies. Efficient stock market prices provide information for the allocation of investment capital and for performance-based management compensation contracts. Liquid share markets make the market for corporate control feasible when the separation of ownership and control is widespread. There is, however, an alternative way of organizing a capitalist economy: it may be organized around banks. In a bank-based economy, it is not clear how information relevant for investment decisions gets transmitted to firms or how the market for corporate control functions. In fact, very little is known about universal banking. In this paper we study the workings of the German universal banking system focusing, in particular, on how the performance of German firms varies depending on the nature of their interaction with banks.

In stock market economies, banks' equityholdings are restricted so that banks and equityholders play distinct roles.[1] Banks play a role in stock market economies by monitoring managements, but this occurs with the bank primarily in the role of a creditor. With respect to determining which management team should be in power and which decisions should be taken, banks appear to be less important except perhaps in times of distress.[2] Instead, disciplining managements occurs via the market for corporate control in which management is contested through takeovers. (See Jensen and Ruback (1983).) A universal banking system is characterized by banks which can underwrite, trade, and, in particular, hold firms' equity; the capitalization of the stock market is small, listings few, trading thin, and as a result hostile takeovers are very rare.[3] In Germany, (a small number of) banks control access to capital markets since new security issues are underwritten by banks. Both systems have nonbank block shareholders (though this is much more prevalent in Germany) who may actively monitor management.

In both stock market economies and universal banking systems there is another way for shareholders to exert power over managers: via voting at annual meetings. But, in the case of Germany, there is a very important difference. In Germany, banks not only lend to firms and own their equity, but also have proxy rights to vote the shares of other agents who keep their shares at the bank (Auftragsstimmrecht). The bank asks whether it can vote on behalf of the shareholder; this right is typically granted (and lasts for fifteen months), but can be revoked. While the right of proxy is not without limits, it does provide a channel for banks to influence management independent of their own

equity stakes in the firm.[4]   Proxy voting concentrates the voting power of dispersed household shareholders into the hands of banks, potentially making them very powerful. In stock market-based economies, like the United States, a corporate takeover requires assembling a block by buying shares in the stock market, a strategy involving the well-known free-rider problem (see Grossman and Hart (1980)).

The differences between stock market economies and German universal banking raise fundamental questions about the organization of the savings-investment process in capitalist economies. First, in the absence of a large stock market, there is the question of how agency problems between managers and shareholders are dealt with in Germany when there is a separation of ownership and control.[5] If shares are not easily traded, how are managers held accountable? Their compensation cannot be linked to stock prices and hostile takeovers are very rare. Secondly, how is information conveyed to German firms making investment decisions when stock market prices are absent or very noisy due to thin trading? The basic issue is whether a relationship with a German bank acts as a substitute for a stock market. Or, put slightly differently, do German banks act to mitigate agency problems in firms or are they detrimental to firm performance?

The behavior of powerful German banks has been controversial for over a century (see, e.g., Hilferding (1910) and, more recently, the report of the Gessler Commission (see Studienkommission (1979) and Krümmel (1980)), but there has been little empirical analysis. The single relevant study, Cable (1985), is discussed below. Critics of universal banking see the power of banks as harmful because of conflicts-of-interest faced when the bank is simultaneously an important large equityholder in the firm, in control of a large number of proxy votes, controls access to external capital markets, and has loans outstanding to the firm.   Because banks, themselves, seem impervious to external control, the concentration of power in banks is seen as allowing them to essentially run firms in their own interests.[6] An opposing view is that German banks are active, large, investors which improve the performance of firms to the extent that they hold equity and have proxy voting power. Banks are seen as long-term investors who oversee firm investments and organize internal capital markets, rather than acting as myopic investors (see, e.g. Porter (1992) and Grundfest (1990)). Proponents of this view see German banks as a model of active stockholders which should be emulated in stock market-based economies

(where many shareholders are dispersed and institutional investors are passive).

In this study we investigate the effect of bank equity ownership on the performance of German firms. We measure performance by return on equity and return on assets; we separately control for the influences of banks as equityholders (like other outside equityholders), as banks (a role perhaps similar to that of firm insiders), and as agents which can have substantial power via the right to vote the shares of other agents (proxy voting). We treat as endogenous the extent of bank representation on the board, firm leverage, and the amount of loans the firm receives from the bank.

In analyzing the relationship between firms and banks we concentrate on testing for conflicts-of-interest which are alleged to be detrimental to firms. The first conflict-of-interest concerns whether the objectives of bank shareholders conflict with those of other shareholders. Because of their role as a bank, banks may have information that other shareholders do not have and may use this information in ways which benefit the bank at the expense of other shareholders. Also, as possible monopolists controlling access to external capital markets banks may require firms they "control" to pay higher interest rates on their loans than they might otherwise pay. The second potential conflict-of-interest concerns proxy voting. While large nonbank blockholders may be able to prevent banks from taking actions which conflict with firm value maximization, small, dispersed shareholders may not be able to prevent these actions. The conflict-of-interest then arises because banks vote the shares of these small holders in proxy. Banks may use the proxy votes they control to maximize the benefits to the bank.

One difficulty with empirically unraveling questions concerning the affects of banks on firms in Germany is that the bank may face conflicts-of-interests over some ranges of bank equityholdings, proxy voting, and other (nonbank) shareholdings, but not over other ranges. That is, conflicts-of-interest could appear as nonlinear affects of these variables on firm performance. Our goal is to investigate the relationship between firm performance and these variables allowing for these possible nonlinearities, but without imposing *ad hoc* functional specifications. While we develop some more specific hypotheses below, economic theory has not yet proposed any functional forms for the hypothesized relationships. Consequently, we start by using a multidimensional semiparametric procedure to estimate the relationship between firm performance and the equity ownership and voting structure of the firm. We test

semiparametric specifications against various parametric specifications to determine the appropriate shape of the relationship. Further structure is then imposed to decide on a parametric specification.

A second possible difficulty concerns the fact that German banking and corporate finance appears to be in the process of change, possibly altering how firms and banks interact. During the early 1980s, firms' reliance on bank loans decreased as did bank equity ownership stakes in firms. Also, banking became more competitive. We address the issue of whether these changes altered the relationship between banks and firms by examining cross sections of firms in 1974 and 1985 and testing for changes in the relationship between banks and firms over this period.

Finally, we analyze possible channels for banks to influence firms' performance. We investigate two channels by which banks, using their power as equityholders and possibly as proxy voters, could influence firms. First, as part of our analysis of firm performance as a function of bank interaction, we investigate whether a banking relationship (i.e., the effects of bank equity ownership and proxy voting) alters firms' interest burden on debt. If banks substitute for capital market discipline, then perhaps the firm's interest burden should be lower. But, if banks are exerting monopoly power over firms, it should be higher. Secondly, banks may exert control over decisions by obtaining board seats. In a separate section, we ask whether equity ownership and proxy voting translate into (supervisory) board of director seats.

The paper proceeds as follows. In Section II we discuss the role of banks in Germany. In Section III we frame the hypotheses to be tested. Section IV introduces the variables to be analyzed and the data. Section V outlines the econometric methodology. Section VI presents the results concerning the effects of banks on firm performance and on the interest burden on debt. Section VII analyzes banks' representation on corporate boards. Section VIII concludes.

II. German Banks and Corporate Finance

In this section we briefly discuss the role of banks in German corporate finance during the periods we subsequently analyze.

A) German Capital Markets and Banks

The German stock market is small compared to the stock markets in the U.S., the U.K. and Japan. Table 1 provides a comparison of the world's major stock exchanges and banking systems for the year 1986.[7] The market value of domestic listed companies as a percentage of Gross Domestic Product is largest in London, New York, Tokyo, and the Swiss exchanges. London, New York and Tokyo have the greatest number of listed companies (with London having the greatest number of foreign listings of these three exchanges). In Germany there are eight stock exchanges, but Frankfurt is dominant (with about half of the equity turnover in 1981).[8] Also shown in Table 1 is the ratio of total assets in the banking system to Gross Domestic Product and the ratio of assets of the banking system which are claims on private agents to GDP. By either of these ratios, the U.S. has the smallest banking system. The latter ratio most clearly shows the importance of banks in Germany, Japan, and Switzerland. These three countries are the leading examples of universal banking, though there are some important differences.[9]

Table 2 compares the pattern of share ownership in the U.S. and Germany. Two patterns are evident. First, banks (and public authorities) hold significant fractions of shares in Germany while they do not in the U.S. Second, in Germany households are the dominant shareholders, though this has been falling (for both the U.S. and Germany). As discussed below, German household stockholdings are held at banks which may then have the right to vote the shares in proxy. Roughly speaking, the fraction of equity held by households can be thought of as corresponding to the amount that is voted by banks in proxy.

Despite the apparent importance of banks in Germany, there is little evidence that German firms rely more heavily on banks for borrowing than do firms in other developed countries (see Mayer (1990) and Edwards and Fischer (1994)).[10] Also, German firms have leverage ratios that are similar to those of firms in stock-market economies (Edwards and Fischer (1994)). Overall, it appears that if there are differences between the German universal bank system and stock market systems it must be due to the roles of banks and stock markets and not to the relative quantities of different kinds of securities.

At the end of 1978 there were 3,415 banks in Germany. These fall into seven categories: commercial banks (Kreditbanken), of which there were 265 holding 25.1 percent of total bank assets;

savings banks and central giro institutions (Sparkassensektor), of which there were 623 holding 38.2 percent of total bank assets; cooperative banking institutions (Genossenschaftssektor), of which there were 2323 holding 14.3 percent of total bank assets; mortgage banks, of which there were 39 holding 13.1 percent of total bank assets; installment credit institutions, of which there were 133 holding 1.1 percent of total bank assets; special-purpose banks, of which there were 17 holding 6.2 percent of total bank assets; postal giro and postal savings banks, of which there were 15 holding 1.9 percent of total bank assets.[11] (See Deutsche Bundesbank (December 1980).) "Universal banking" means that banks are allowed to offer the full range of commercial and investment banking services (including lending, deposit-taking, and all aspects of the securities business: purchase and sale of securities for others, securities custody business, holding and trading on their own account, underwriting, etc.). By this definition, all three types of banks engage in universal banking, though depending on the state (Bundesland) they are located in, savings banks' face some restrictions on holding and trading equity (see Krümmel (1980)). But, of these institutions, the large banks are particularly important. These banks (Großbanken) are Deutsche Bank, Dresdner Bank, Commerzbank, Bayerische Vereinsbank, and Bayerische Hypotheken- und Wechselbank. Three of these banks, Deutsche Bank, Dresdner Bank, and Commerzbank, are referred to as the "Big Three." At the end of 1978 the Big Three held 13.6 percent of the total bank assets.

B) Banks and Equity Ownership

Our data sets, discussed below, consist of two cross-sections of large public limited companies (Aktiengesellschaften (AGs)).[12] Table 3 provides the details of bank equity ownership, proxy voting, and nonbank block ownership for our two samples. An important dimension of a firm's equity ownership structure is the extent to which ownership is concentrated. To measure the extent of blockholding we use a Herfindahl index.[13] The Herfindahl index is included in the table three times: (i) including bank equity ownership, where each bank is treated as a separate firm; (ii) excluding the banks; (iii) only banks.

The table shows that banks, as a group, generally own much less than 25 percent of the equity in firms and control less than 25 percent of the proxy votes. Thus, for the largest German firms (which compose our samples), control by banks -- if it exists -- does not appear to depend on the sheer number

of votes. This point is emphasized by the fact that in Germany a large fraction of public companies have a single (nonbank) shareholder who holds at least 25 percent of the stock. Our samples display the importance of (nonbank) blockholders: 70 out of 88 firms in the 1974 sample have blockholders holding at least 25 percent; for the 1985 sample it is 46 out of 57. This is also clear from comparing the Herfindahl indices with and without banks; the means and medians of the indices with and without banks for the two samples are very close. The Herfindahl index with banks only is very low in comparison.

These aspects of our sample are not aberrations. Franks and Mayer (1994) study a sample of 171 German companies during the late 1980s and find that in 85 percent of these companies there is a single shareholder who holds at least 25 percent. Also, Edwards and Fischer (1994) report that: "The vast majority of German AGs have a single shareholder who owns 25 percent or more of the voting capital" (p. 194).

The pattern of large nonbank blockholders in Germany is very different than in the U.S. and the U.K. In the U.S. a survey of stock exchange listed firms in 1984 showed that only 20 percent of the firms had at least one nonofficer who owned ten percent of firm stock; thirteen percent of the firms were majority owned (see Holderness and Sheehan (1988)).[14] In the U.K the proportion of public limited companies with a majority shareholder is also far smaller than in Germany (see Edwards and Fischer (1994)).

Another important observation about equity ownership is that there is a concentration of bank equity ownership in the big banks. The big banks held 50 percent of all German banks' holdings in 1970 and 51.3 percent in 1986 (Deutsche Bundesbank (1987); also see Edwards and Fischer (1994)). Our samples show this same concentration (though this is not evident from the tables). This concentration is due to the central role that the big banks play as retail stock brokers. Only banks can act as brokers for the public and the big banks dominate retail brokerage.

A final stylized fact of some importance is that in most cases of bank block ownership there is only one bank among the blockholders. In other words, bank stock ownership tends to be concentrated in a single bank, one of the large banks mentioned above. This can be seen in the lower part of Table 3. In only a small number of cases is there more than one bank owning a significant amount of stock

in a firm. For example, in the 1974 sample, in only seven percent of the cases is there more than one bank each owning at least five percent of the firm's equity.

Subsequently we will be concerned with the affects of bank equity ownership on firm performance. We will assume that bank equity ownership is exogenous. This means that an important issue concerns why and when banks acquired equity. All the available information suggests that the assumption of exogeneity is correct. The Deutsche Bundesbank reports that:

> German banks originally acquired part of their shareholdings .... via special transactions or through "rescue operations" for enterprises which had got into liquidity difficulties. Portfolio considerations alone never tip the scales when banks are contemplating the purchase of equities ...[Monthly Report of the Deutsche Bundesbank (April 1984, p.16)].

"Special transactions" refers to purchases of blocks from family owners who are selling out.[15] Also, see Goergen (1995) who reports that equity ownership structures tend not change much through time; ownership does not become dispersed when German companies go public. In our samples companies in the process of restructuring and companies which were recently restructured are excluded.

C) Proxy Voting

Since German shares are bearer securities, individual stockholders keep their shares at their bank. By agreement German banks have the right to exercise proxy votes of these shareholders.[16] Banks do not, however, have unlimited power to vote shares held at the bank. Prior to the annual meeting banks inform the shareholders they represent as to how they will vote at the meeting. If individual shareholders disagree with the bank, they can indicate how they want to vote by informing the bank (by mail). The bank must then follow these instructions.

Proxy voting rights are by-products of conducting retail stock brokerage through bank branches and should be viewed as passive. Banks do not actively compete for proxy votes. Banks with large networks of branches simply have many customers and these people keep their shares at the bank without special instructions. Thus, there is no causality going from bank equity ownership to proxy votes.

Proxy voting rights tend to be concentrated in the largest banks due to the fact that these banks happen to have large retail branching networks. In the late 1970s the largest six private (i.e., non-state-owned) banks controlled about three quarters of the voting rights of individual consumers (Krümmel (1980)). The Big Three banks held just under half of the deposited shares in 1988 (Deutsche Bundesbank

(April 1989)). Table 3 provides information on distribution of total bank proxy voting in our samples. The table shows that bank proxy voting rarely exceeds 25 percent of the firm's outstanding shares and has declined between 1974 and 1985. The correlation between individual bank equity ownership and proxy voting is not high because proxy voting is a passive by-product of retail brokerage.

Proxy voting power is clearly potentially important because the votes of dispersed shareholders are concentrated in banks. These votes can be used when important decisions are made at the general meeting. In particular, membership on the supervisory board is determined by elections at the general meeting. (By law, AGs must hold a general shareholders meeting at least once a year.) Also, as discussed below, blockholders' voting power may be limited, making banks holding proxy votes more important.

D) Equity Voting Restrictions

Two types of voting restrictions are important in the organization of AGs, and these are taken into account in the empirical analysis. Table 4 lists the firms and voting restrictions from our samples, also showing the year the restriction was adopted.[17] First, the voting rights of shareholders can be restricted by an AG's charter (articles of association) to a maximum number of votes regardless of the amount of shares owned. Typical restrictions are five percent or ten percent. Such a restriction means that, regardless of how many shares are owned, the holder is only allowed to vote a number of votes equal to five or ten percent of the total votes. Clearly, this type of restriction constrains the power of block shareholders. Note, however, that banks voting shares in proxy are not bound by this restriction (though they are bound with respect to their own shares).[18] These restrictions potentially make banks more powerful than nonbank shareholders and, consequently, it is not surprising that banks have supported these restrictions, though they have always been initiated by management (see Edwards and Fischer (1994)).

The second type of restriction which is true of all AGs concerns the importance, according to the articles of association, of certain critical fractions of votes. For all firms, a holder with 25 percent of the votes can veto charter amendments (this is the law). Also, 75 percent of the voting shares present at the shareholders' annual meeting are legally required for appointment and dismissal of management

board members.

As discussed below, it is likely that voting restrictions are endogenous, that is, they are a function of the equity ownership and voting structure and, hence, should have no separate effect.

III. German Banks, Equity, and Corporate Control: Hypotheses

Do banks have the power to affect firm performance and, if so, how do they use this power? It may appear that bank equityholding is unimportant because it is usually small relative to nonbank blockholders. But this conclusion might be premature. Corporate control is not only a function of the number of shares owned. First, banks have proxy voting rights in addition to the votes of their own shares. Secondly, as discussed above, there may be restrictions on voting which prevent a blockholder from exercising control. These restrictions do not apply to bank proxy voting, giving banks unique power to the extent that they vote proxies. Finally, blockholders may have votes, but not enough information to use their power effectively. Banks, on the other hand, may have superior information which they can use to their advantage even if their holdings are small and there is a large blockholder present. Also, banks may have power because they are lenders and they may guard access to capital markets.

We focus on how firm performance (profitability) varies in cross-section as a function of: (i) how much of the firm's equity banks own; (ii) how much of the firm's equity banks vote in proxy; (iii) the extent to which there are block shareholders; (iv) other factors which capture characteristics of the firm which may affect performance. In particular, let EB_i be the fraction of equity banks own in firm i; VB_i is the fraction of equity banks have proxy rights over; $Herf_i$ is a measure of the equity ownership structure of firm i (discussed below); and X_i represents other variables affecting firm performance. P_i is a measure of firm performance. The performance of firm i is first investigated in the following semiparametric form:

$$P_i = X_i'\beta + f(EB_i, VB_i, Herf_i) + \epsilon_i \tag{1}$$

where f is an unknown, possibly nonlinear, smooth, function, but where the relationship between X_i and performance is a (known) parametric function; ϵ_i is a mean-zero error term due to measurement error.

Our investigation of (1) focuses on two sets of issues. First, what equity ownership variables affect firm performance. If banks have power to affect firm performance, then their shareholding and, possibly, proxy voting, should be significant determinants of firm performance. Second, how banks use such power, and whether there are conflicts-of-interest, concerns the shape of (1). Below we develop hypotheses about the shape of (1) and about which measures of equity ownership are important determinants of firm performance.

Note that the specification, (1), assumes that the firm's capital structure, the amount of bank borrowing, and the amount of retained earnings (i.e., dividend policy), and board composition, are endogenous. These variables are, at least partly, determined by the same independent variables as determine P_i. We discuss this further below when we analyze the determinants of firm board composition.

The specification, (1), also treats banks in an aggregate fashion; bank equity ownership and proxy voting are each added up across banks. There are two reasons for this. First, empirically it is the case that there is usually a single bank which is the dominant bank equityholder for firms where banks are important owners. Second, the large banks hold a majority of each other's shares (based on proxy votes), strongly suggesting the possibility of collusion (see Edwards and Fischer (1994)). As a group, the Big Three hold the majority of votes at their own annual meetings (see Gottschalk (1988)).

A) Conflicts Between Bank Equityholders and Other Equityholders

Bank equityholding may affect firm performance because banks may have more information than other shareholders by virtue of being lenders. If banks have any power to affect firm performance, there are three possibilities concerning how they use this power. First, the interests of banks may coincide with the interests of other shareholders. Banks improve firm performance to the extent that they hold equity: the more equity the bank holds, the more it has at stake and, hence, the more it uses its information and power to monitor the firm's management, improving the performance of the firm. The Coincidence-of-Interests Hypothesis is that, *ceteris paribus*, performance is monotonically increasing in the fraction of

firm stock owned by the bank over the entire range of equity ownership:

> H_{IA}: *(Coincidence-of-Interests) Over the entire range of bank equity ownership, the relationship between firm performance and the fraction of equity owned by banks is upward sloping, ceteris paribus.*

This hypothesis holds the other two independent variables of interest, proxy voting power and the extent of nonbank shareholding concentration, constant.

The Opposed Interests Hypothesis is that the interests of banks are always opposed to those of other shareholders. By virtue of their role as lenders, as well as equityholders, and to the extent that capital markets are not a very competitive financing option, banks may behave as monopolists, using their power to extract profit from the firm at the expense of firm performance. The view that German banks act as monopolists to the detriment of firm value is a long-standing criticism. Even the Deutsche Bundesbank disingenuously notes that:

> When enterprises are deciding on which financing methods to adopt, the advice of their principal bankers may sometimes be to take up new loans, because the share issue which might be to the advantage of the enterprise is not rated so highly by the bank; however, definite statements in this regard can neither be made nor proved. (Monthly Report, April 1984, p. 15.)

For example, monopoly profits can be extracted by increased borrowing from the bank, possibly at monopoly interest rates. The Opposed-Interests Hypothesis is that:

> H_{IB}: *(Opposed-Interests) The relationship between firm performance and the fraction of equity owned by banks is downward sloping, ceteris paribus.*

The Opposed-Interests Hypothesis is that German banks unambiguously reduce the performance of firms as equity ownership increases, even at 100 percent ownership.[19]

The final hypothesis concerns the possibility that the bank faces a trade-off between its private benefits (monopoly profits or private returns to bank managers) and the value of its shares depending on its ability to extract private benefits (which may depend on the amount of its equityholdings). That is,

the relationship between firm performance and bank equityholding is nonlinear: performance falls as a function of the amount of firm equity the bank owns but then rises. We label this the "Insider" Hypothesis, for reasons explained below.

The Insider Hypothesis views the bank as facing a conflict of objectives so that depending on how much equity it owns it sometimes behaves according to the Opposed-Interests Hypothesis and sometimes according to the Coincidence-of-Interests Hypothesis. Recent research on U.S. firms suggests that firm managers (insiders) face this trade-off. Morck, Shleifer and Vishny (1988) examine the effect of insider concentration (the fraction of firm equity owned by top management) on nonfinancial firms' performance, as measured by Tobin's Q. They impose a piecewise linear relationship and find that as insider ownership rises from zero to 5 percent, Q increases; then Q falls as the insider concentration grows to 25 percent; finally, it again rises at higher ownership levels. (Between 5 and 100 percent the relationship is U-shaped.) They interpret these results as showing the balance of three factors. For small insider holdings, the incentives of insiders become more aligned with those of the outsiders, but management does not have enough power to extract private benefits. However, as insider concentration continues to rise, management becomes "entrenched," that is, equity shares are large enough to stave off effective outside disciplining, but not so large that management interests are the same as those of outside shareholders. A further increase in concentration aligns management interests with outsiders; managers essentially become the sole owners. McConnell and Servaes (1990), also examining U.S. nonfinancial firms, impose a quadratic relationship between Tobin's Q and the fraction of stock owned by top management (the insiders). They find that Q initially rises, and then falls as interests between the two groups become aligned. (The relationship is inversely U-shaped.)[20]

The Insider Hypothesis is that similar problems occur in Germany with banks playing the role of insiders. Holding nonbank outside ownership and the bank's proxy voting power constant we can test:

H_{IC}: (Insider Hypothesis) The relationship between firm performance and the fraction of equity owned by banks is downward sloping over some initial range of bank equity ownership and then upward sloping, ceteris paribus.

In other words, holding VB and Herf (and X) constant, there exists an initial range of EB over which $\partial P/\partial EB < 0$; the partial derivative then changes sign when EB is higher. The hypothesis says that if performance is not monotonically increasing in the fraction of firm equity owned by the bank, then banks behave as entrenched insiders over the range where performance declines.

In the above discussion we have taken the banks' fraction of proxy votes (VB), the equity ownership structure of the firm (Herf), and other factors (X) as constant. But these influences clearly can affect the banks' behavior. For example, a bank which might prefer to take actions to benefit itself at the expense of the shareholders may be prevented from doing so by a large nonbank blockholder. We discuss these interactions next, starting with proxy voting.

B) Conflicts Between Bank Proxy Voting and Equity Ownership

Proxy voting by banks, creating a concentration of voting power, would seem to create the clearest possibility of a conflict of interest and, for this reason, has been very controversial in Germany. If proxy voting affects performance, then the three possibilities for how banks use their proxy votes are the same as outlined above. In the case of the Coincidence-of-Interests Hypothesis or the Opposed Interests Hypothesis, bank equity holdings plus proxy voting is the relevant variable for the affect of the bank on performance. But, importantly, there is another possibility: How banks use their proxy votes may depend on how much equity they own. According to the Insider Hypothesis, with low amounts of equity the bank uses the proxy votes to enforce decisions in its private interests while at high levels of equity the bank uses proxy votes to maximize the value of the firm. Thus, in the case of the Insider Hypothesis:

> H_2: *(Insider Hypothesis) There is a critical value of bank equity ownership such that performance is increasing in bank proxy rights above this level and decreasing below.*

In other words, there is a critical fraction of bank equity ownership, EB*, such that, holding H (and X) constant, $\partial P/\partial VB > 0$ for EB > EB* and $\partial P/\partial VB < 0$ for EB < EB*. At EB* the bank switches its voting behavior.

C) Nonbank Block Shareholders

In stock market economies outside block shareholders are often viewed as monitors of firm managements because, by virtue of the size of their stake in the firm, they have an incentive to actively oversee management. In stock market economies, dispersed small shareholders may face free rider problems in monitoring firm management if monitoring is costly. (See Grossman and Hart (1980) and Shleifer and Vishny (1986).) The empirical evidence for the U.S., while somewhat mixed, appears to support the importance of large shareholders in increasing firm value.[21]

Since, as mentioned above, 85 percent of the largest quoted German companies have a single shareholder owning at least 25 percent of the shares, the monitoring role of blockholders may be very important in Germany and might account for why hostile takeovers are not necessary, and hence, rare. Nonbank blockholders may be so powerful that they monitor managements and banks, preventing banks from falling prey to their conflicts-of-interest. But, nonbank blockholders may also behave as insiders, reducing firm performance over some range of equity, but then improving firm performance over higher ranges of equity. There are other possibilities as well. For example, banks may collude with a large blockholder. Basically, a number of (nonlinear) interactions with the bank equity ownership and proxy voting are plausible. These considerations suggest the importance of controlling for the entire equity ownership structure of the firm in attempting to detect the affects of banks on performance and, further, emphasize the importance of the specification issue.

IV. Data

We analyze two cross-sections of large German firms (AGs). The first sample is from 1974 and contains 88 observations; the second is from 1985 and contains 57 observations. These samples are small because of the difficulty of obtaining German data, especially data on proxy voting. In this section the data for each of these two samples are explained and summarized (details are contained in Appendix A). First, however, in subsection A, we discuss the equity ownership measures and in subsection B we discuss the firm performance measures. Then each of the two samples are discussed, in subsections C and D, respectively.

A) Equity Ownership

The equity ownership structure of each firm is measured with three variables: the fraction of equity that is owned by banks (EB); the fraction of equity that the banks vote in proxy (but do not own) (VB); and a Herfindahl index of the ownership structure including individual bank equityholdings (Herf) (Appendix C discusses calculation of this index). Calculation of the banks' ownership share takes indirect ownership into account in cases where shares are held by a pure investment company (but not if shares are held by another nonfinancial firm). The Herfindahl index is based on voting stock only.

The number of shares that banks vote in proxy is calculated based on firm reports from their annual meetings (as discussed below). These reports list the equityholders who were present at the meeting and how much they voted. Not all shareholders attend the annual meeting. The bank proxy voting percentage is the actual percentage that the banks voted at the annual meeting.

It is important to note that since the banks are included in the Herfindahl index, any affect we detect from bank equity ownership (EB) must be due to a channel which is different than that which is available to a nonbank blockholder.

B) Performance Measures

We use accounting measures of profitability as our measures of performance. As explained in Appendix B, we examine the return on total assets (Gesamtkapitalrentabilität) and return on equity (Eigenkapitalrentabilität). These measures are calculated as the mean of two annual measures. We examine return on equity in addition to return on assets to determine whether a bank blockholder implements a redistribution between shareholders and bondholders. That is, conflicts-of-interest may be present with respect to the distribution of returns, rather than to the level of the return on assets. For this reason we also analyze the interest burden on debt (see Appendix B).

Accounting measures of firm performance have been widely used by other researchers, e.g., Demsetz and Lehn (1985), though in our case we rely on German accounting. Contrary to the extreme view that German accounting numbers are meaningless, Harris, Lang, Möller (1994) find that the relationship between 18-month stock returns and annual earnings is basically the same as in the United States (they studied large German firms over the period 1982-1991).

Other candidate measures, such as Tobin's Q or the market-to-book equity ratio, require stock market prices which are either unavailable or unreliable (except for a smaller sample of firms).[22] In our 1974 sample only 50 out of the 88 firms are traded at the stock exchange and another six are only traded over-the-counter. There are several problems with using the data even for those firms that do have some traded equity. First, only 36 out of 88 have all their classes of shares traded on the exchange (Daimler Benz and Siemens are not among them). Second, when companies are traded over-the-counter price data are unreliable.[23] The third problem is that 23 of the 88 companies have more than one class of equity. When there are multiple classes, trading is often sparse in many classes and so their prices are unreliable. Similar problems exist with the 1985 sample.[24]

C) Data: The 1974 Sample

The data sources are fully described in Appendix A. The 1974 sample was constructed by selecting the 88 public companies (AGs) from the list of the top 100 firms published in Hauptgutachten II der Monopolkommission (Hauptgutachten 1976/1977) which were usable. The criteria for choosing the firms and ranking them is described in Hauptgutachen der Monopolkommission I (Hauptgutachten 1973/1975). Appendix Table A1.1 lists the companies dropped and the reasons for dropping them from the sample. Appendix Table A1.2 shows the distribution of the 88 companies in our 1974 sample according to their International Standard Industrial Classification. Performance measures and other accounting variables are the averages of two calendar years as explained in Appendix A. Table 5 provides summary statistics for various characteristics of the firms in the sample as well as the two performance measures and the interest burden on debt.

D) Data: The 1985 Sample

The 1985 sample is drawn from the list of the 100 largest (by sales) German manufacturing firms (of all legal forms) published on October 3, 1986 by the Frankfurter Allgemeine Zeitung.[25] Thus, unlike the 1974 sample, the 1985 sample contains no retailers, transport, or media companies.[26] We followed Böhm (1992) in using this list (see Appendix A). The list contains 66 stock companies (AGs). Of these we had to drop nine companies; (Appendix Table A2.2 lists the companies dropped and the reasons for dropping them.) Appendix Table A2.1 lists the companies included, their rank, and their rank in the

1974 sample. Performance measures, debt interest burden, etc. were calculated based on the calendar years 1985 and 1986, averaging over these two years. Table 5 shows summary statistics for the 1985 sample.

E) Other Independent Variables

In addition to the three independent variables of direct interest, we want to control for other, exogenous, characteristics of the sample firms which may affect performance. Because of data limitations we are able to do this in only a restricted way. The following additional variables are included unless otherwise indicated:

TA: Total Assets of the firm, i.e., size.

VR: Voting Restriction: 1 if there is a voting restriction; 0 otherwise.

FO: Foreign Ownership: 1 if the majority of the firm's voting shares are owned by a foreign company; zero otherwise.

SO: State Ownership: 1 if a majority of the voting shares are (directly or indirectly) owned by the government (federal or provincial); zero otherwise.

ISIC j: Industry dummy for industry j (using the International Standard Industrial Classification, see United Nations (1990)).

Note that we do not expect that the dummy variable for the presence of a voting restriction will be significant. If the presence of a restriction is explained by the ownership structure and bank proxy voting (which explain performance), then there should be no significant affect of the voting restriction separately. Also, if the ownership structure and voting changed as a result of the imposition of a restriction, then again there should be no separate influence of the restriction since it is again covered by the ownership and voting structure.

V. Econometric Methodology

Our questions are: (i) whether bank equityholding and proxy voting influence firm performance; and (ii), if so, to empirically discriminate between the Opposed-Interests, Coincidence-of-Interests, and

Insider hypotheses, discussed above. The first question concerns what variables should be arguments of the function, (1), while the second is a specification issue since it concerns the shape of (1). There is an econometric difficulty since the affects of the equity ownership and proxy voting variables on firm performance may be highly nonlinear, but in an unknown way. Economic theory provides little guidance as to the details of these nonlinearities, other than as discussed above. Our empirical strategy is motivated by these complications.

Since the shape of (1) is critical to our investigation, our approach is to start by using a semiparametric estimation procedure to search for nonlinearities. A semiparametric procedure avoids having to specify a parametric form for (1); asymptotically the data can determine the correct specification, subject to having to specify a "window size," as discussed below. We test for the appropriate semiparametric specification (i.e., window size), but also include some parametric functions as potential candidates. If we find unbiased parametric functions, we proceed to further test between them. Thus, our strategy is to try to impose structure on (1) in a step-by-step fashion, starting from as little structure as possible and proceeding by letting the data guide us, possibly to a parametric form.

A) Semiparametric Estimation: Overview

We will estimate equation (1) where, in vector notation, $E(\epsilon | X, EB, VB, Herf) = 0$ and where $W = (P, X, EB, VB, Herf)$ is identically distributed. The relationship, (1), consists of a parametric part (the term $X'\beta$) and the nonparametric part, the function $f(\bullet)$. We want to allow full generality as to the possible shape of $f(\bullet)$. But, estimation of (1) and inference are complicated by the combination of the parametric component with the nonparametric, smooth, component.[27] We follow Speckman (1988) and estimate (1) as follows. We assume the existence of a smoother matrix, K (we use locally weighted regression, as described below). The problem is that it cannot be applied immediately to estimate the nonparametric part of (1) because of dependence on the parametric part, $X'\beta$. The basic approach is to purge each component of dependence on the other component, and then estimate the parametric part with OLS and the nonparametric part with a nonparametric estimator. Consequently, start by defining:

$$\mathbf{X}^* = (\mathbf{I} - \mathbf{K})\mathbf{X}$$

$$\mathbf{P}^* = (\mathbf{I} - \mathbf{K})\mathbf{P}$$

which are the variables $\mathbf{X}$ and $\mathbf{P}$ "adjusted" for dependence on $\mathbf{EB}$, $\mathbf{VB}$, and $\mathbf{Herf}$, via $\mathbf{K}$. ($\mathbf{I}$ is the identity matrix.) Then β is estimated from partial residuals by:

$$\hat{\beta} = (\mathbf{X}^{*'}\mathbf{X}^*)^{-1}\mathbf{X}^{*'}\mathbf{P}^*.$$

And the estimate of the nonparametric part is given by:

$$\hat{f} = \mathbf{K}(\mathbf{P} - \mathbf{X'}\hat{\beta}).$$

Assume that X and $(\mathbf{EB}, \mathbf{VB}, \mathbf{Herf})$ are related via the regression model $E(X \mid \mathbf{EB}, \mathbf{VB}, \mathbf{Herf}) = h(\mathbf{EB}, \mathbf{VB}, \mathbf{Herf})$, i.e.,

$$X = h(\mathbf{EB}, \mathbf{VB}, \mathbf{Herf}) + \eta \tag{2}$$

where η is a mean zero error term independent of $\mathbf{EV}$, $\mathbf{VB}$, and $\mathbf{Herf}$. Assuming (2), Speckman (1988) proves that: $n^{\frac{1}{2}}[\hat{\beta} - E(\hat{\beta})] \sim N(0, \sigma^2 V^{-1})$, where $n^{-1}\eta'\eta \to V$, where V is positive definite, and that the bias in estimating the nonparametric function, f, and its variance are negligible.

With regard to the choice of $\mathbf{K}$, we use locally weighted regression (see Cleveland and Devlin (1988), Müller (1987), Stute (1984), and Cleveland (1979)).[28] Local regression uses a weighted least squares estimate at each point using a neighborhood of the data points determined by choice of a window size or smoothing parameter, say g. The function $f(\bullet)$, at a point in the data, is estimated by linear or quadratic weighted least squares. By varying the independent variables and recalculating the relevant neighborhood and weights at each point, the function can be traced out over its (in this case, three

dimensional) domain. Intuitively, the procedure is analogous to a moving average in time series analysis. Instead of averaging over time, however, the average is with respect to a neighborhood around each point (in cross-section). Standard errors can be calculated following Cleveland and Devlin (1988).

B) Specification Testing: The M-Statistic

There are two specification issues to be confronted. First, while locally weighted regression does not require a functional form to be specified, it does require that a smoothing parameter, g, be specified. Second, we will also propose some functional forms and test their appropriateness. In this subsection we outline a specification test due to Cleveland and Devlin (1988) and based on Mallows (1973).[29]

Let z_i be the triplet $\{EB_i, VB_i, Herf_i\}$ for firm i. With respect to the first specification issue, note that the estimate of f($\bullet$) at an observation, z_i, uses the q observations whose z_i values are nearest to z. The smoothing parameter g is the fraction of the sample used at each point to estimate the function at that point, i.e., g = q/n, where n is the sample size. Thus, the estimate of f($\bullet$), say $\gamma_g(\bullet)$, depends on g, the smoothing parameter and, therefore, the expected mean squared error also depends on g.

The expected mean square error, m_g, is: $m_g = B_g + V_g$, where B_g is the contribution of bias to the expected mean square error and V_g is the contribution of variance. The specification difficulty is that choice of window size, g, trades-off variance of the estimator against bias.[30] Nonparametric estimators are biased; when $\gamma_g(z)$ is a nearly unbiased estimate (which occurs when g is low), then the expected value of B_g is nearly 0, but this depends on the choice of g. The expected mean squared error summed over z_i, i = 1,...,n and divided by σ^2 is:

$$m_g - \left[E\sum\nolimits_{i-1}^{n}(\gamma_g(z_i) - f(z_i))^2\right]/\sigma^2$$

where the dependence of $\gamma(\bullet)$ on the smoothing parameter, g, is shown.

Let s^2 be an estimate of σ^2 when the smoothing parameter, g, is small. A small smoothing value is chosen so that the bias of $\gamma_g(z_i)$ is negligible, resulting in a nearly unbiased estimate of σ^2. Let:

$$B_g = e_g'e_g / s^2 - tr(I - K_g)'(I - K_g)$$

and $V_g = trK_g'K_g$ (where e_g is the vector of estimated residuals obtained when smoothing parameter g

is employed). The subscript, g, on **K**, indicates the dependence of the smoother on g. The expected mean squared error, m_g, can be estimated by:

$$M_g = B_g + V_g.$$

B_g is the contribution of bias to the estimated mean squared error, and V_g is the contribution of variance. When γ_g is a nearly unbiased estimate, then the expected value of B_g is nearly 0, so the expected value of M_g is nearly V_g. As g increases, bias is introduced, B_g has a positive expected value, so the expected value of M_g exceeds V_g.

V_g is called the equivalent number of parameters of the fit (by analogy with Mallows (1973) C_p statistic); it decreases as g increases (i.e., more smoothing results in a smaller equivalent number of parameters). If $E(M_g) = V_g$, then the bias is negligible. Cleveland and Devlin (1988) show that the distribution of M_g under the assumption of no bias is (approximately) an F distribution. (See Cleveland and Devlin (1988) for the degrees of freedom and Cleveland, Devlin, and Grosse (1988) for Monte Carlo studies of the approximation.) Using this result, we can calculate the null hypothesis distribution of no bias for each g. We will convey this information with a graph of M_g against variance, V_g, i.e., the equivalent number of parameters. The plots will also show the 90 percent confidence intervals.[31]

The M-plot is very convenient because in one diagram we can convey all the information about the specification tests. We can plot the M-statistic for a range of smoothing parameters, g. Also, with respect to the second specification issue, the same statistic can be calculated for parametric specifications. We are interested in specifications for which bias is negligible.[32]

VI. The Effects of Banks on Firm Performance

In this section we test various specifications and then draw inferences about the shape of the estimated surfaces in the two samples. Subsections A and B address the issue of the shape of (1). If we detect nonlinearities, this would be evidence in favor of the Insider Hypothesis. Subsection C then uses these results to estimate a specification of (1). This subsection addresses the question of which equity

variables affect firm performance, if any. Subsection D discusses the results for the 1975 sample in relation to the previous work of Cable (1985). Subsection E examines the change in the relationship between banks and firms over the period between the dates of our two samples.

A) The Insider Hypothesis in the 1974 Sample

Figure 1 is an M-plot for the return on assets for the 1974 sample with g=0.5 to g=1.0 with steps of 0.05.[33] In the figure, the right-most x-symbol is for g = 0.5 and increases moving from right to left (since V_g decreases) until we come to the left-most x-symbol. We also include two parametric specifications: linear and quadratic (including cross-terms of EB, VB, and Herf). The left-most box is the linear specification; the other box is the quadratic specification. In the figure, the upward sloping line is $M_g = V_g$. The vertical lines are 95 percent confidence intervals. The figure shows that the M-statistic does deviate by a significant amount from V_g (which would indicate the presence of significant bias) for some window sizes. But, note that the linear and the quadratic specifications are unbiased for the return on assets.

Figure 2 shows the M-plot for the return on equity. Again, both linear and quadratic specifications are acceptable in terms of bias. This can be seen by noting that the box symbols to the left are within the confidence intervals drawn. Figure 3 is the M-plot for the interest burden on debt. The results here are similar to the other M-plots.

One reaction to these results might be that the samples are too small to detect any important nonlinearity, especially when we are considering three possibly nonlinear dimensions. Obviously, more data is preferred to less, but Fowlkes (1986) shows that smoothing with more than three independent variables is reasonable with fairly small data sets. (Also, see the discussion in Cleveland and Devlin (1988).) It is important to keep in mind that very little structure is imposed on the data with the semiparametric estimators. With little structure, results are less precise. But, we have made important progress: both the linear and the quadratic specifications are acceptable in terms of bias.

We can go further now and ask which of the two parametric specifications is be preferred. With more structure, we can be more precise. We use an F-test to determine the joint significance of the quadratic and cross-terms based on a Seemingly Unrelated Regression of the three equations (where the

dependent variables are return on assets, return on equity, and interest burden on debt). (See Cleveland and Devlin (1988) for an explanation of the F-test.) The result is: $F(91;253) = 0.547$; $p=0.999$. Thus, the quadratic specification is rejected.

The conclusion from our specification search is that a linear parameterization is best. This means that the Insider Hypothesis is rejected for the 1974 sample because the relationship is monotonic in the equity variables. There are no conflicts-of-interest. The remaining questions concern whether banks affect firm performance and, if so, whether the interests of banks are opposed to or coincident with those of other shareholders. Before addressing this, however, we turn to the 1985 sample.

B) The Insider Hypothesis in the 1985 Sample

Figure 4 shows the M-plot for the return on assets for the 1985 sample. The plot begins with $g=0.7$ and increases to $g=1.0$ by steps of 0.05. The symbols are as in the previous plots. Note that the symbols for the linear and quadratic specifications are within the 95 percent confidence interval. Figure 5 shows the M-plot for the return on equity. Figure 6 shows the M-plot for the interest burden on debt. These latter two variables also show that both linear and quadratic specifications have acceptably low levels of bias.

Since both linear and quadratic specifications have acceptable levels of bias, we proceed as before to narrow our specification choice by testing whether the quadratic and cross-terms are significantly different from zero in a Seemingly Unrelated Regression of the three variables. The result is: $F(82;158)=1.244$; $p=0.122$. Again, the quadratic specification is rejected. As above, this means that the Insider Hypothesis is rejected for the 1985 sample.

C) Are the Interests of Banks and Other Shareholders Coincident or Opposed?

Based on the above results, we now turn to examining the parametric specification: linear in all variables. We conduct Seemingly Unrelated Regression on the pooled sample. (White-corrected t-statistics are reported (see White (1980).) Table 6 shows the results for the return on assets and Table 7 shows the results for the return on equity.

The results for the 1974 sample are quite dramatic: (i) by either performance measure, performance increases as a function of how much equity the banks own; (ii) performance is not related

to proxy voting; (iii) performance is not related to blockholdings.[34] Note that the power of the banks cannot be due to the fact that they are blockholders since banks are included in the Herfindahl index of equity ownership. Thus, in the 1974 sample, the results suggest that banks have power to affect performance by virtue of being banks. Moreover, they appear to use the power associated with owning equity to improve performance. But, banks do not use proxy voting to affect firm performance. There do not appear to be any conflicts-of-interest during this period. The Coincidence-of-Interests Hypothesis best describes the 1974 data.

These results are consistent with the view that bank blockholders have an incentive to monitor firms once they have purchased the block from a family. If the stock market is not liquid, the bank blockholder can only sell at a large loss, creating an incentive to maintain a relationship with the firm. (See Kahn and Winton (1995).) But, while this argument is true of all blockholders, the results go further to distinguish banks from other blockholders in their ability to affect performance: banks are more powerful than nonbank blockholders since they affect performance while nonbank blockholders do not.

If banks improve performance with respect to their own holdings, why do they not use their proxy power to further improve firm performance? There are several possible explanations for this result. First, were banks to use their power overtly (even if for the good) they may face social sanctions. Second, bank power is limited by the ability of individuals to tell banks how to vote. But, if individuals felt this was necessary to do, they might prefer to deposit their stock with another bank. Competitive pressure, thus, may limit bank power.

Tables 6 and 7 also show the results for 1985. By comparison with 1974 the results are again surprising: (i) by either performance measure, performance is unrelated to how much equity the banks own; (ii) as in the 1974 sample, performance is not related to proxy voting; but, (iii), performance is related to blockholdings. We investigate the change between 1974 and 1985 further below.

Table 8 reports the results for the interest burden on debt. The equity ownership and voting structure have no effects on the interest burden. Since, for each sample, both performance measures give the same results, there is no transfer between equityholders and debtholders. This is consistent with the results in Table 8.

We now turn to discussing the results, starting with the results for 1974.

D) Discussion of Cable (1985) and the Results for 1974

Cable (1985) is the only relevant previous study of the effects of German bank relationships on German firms' performance. Cable (1985) uses a subset of our sample for 1974. Cable's (1985) dependent variable, a performance measure, is the ratio of the after-tax flow to equity to total capital assets of the firm. While Cable estimates many models, the most general includes: (i) the square of each bank's voting fraction; (ii) a dummy variable for each of the three largest banks which equals one if the bank has supervisory board seats; (iii) the ratio of total bank borrowing to total debt; (iv) a Herfindahl Index of the top 20 nonbank shareholders; (v) normalization variables.

There are a number of important differences between Cable's approach and ours.[35] First, calculation of Cable's performance measure appears flawed since it divides the income of the owners by total assets (i.e., the numerator of return on equity and is divided by the denominator of the return on assets). Second, our view is that board membership and bank borrowing are endogenous. In particular, it is difficult to understand why the specification includes the ratio of total bank borrowing to total debt as an independent variable when it would seem to depend on the ownership variables which are also included. Thirdly, Cable does not differentiate between bank equityholdings and bank proxy voting (he includes the sum of EB and VB).

Though it is hard to interpret Cable's results, Cable's own basic conclusion is that there is a significant positive impact on firm performance from interaction with banks. As Edwards and Fischer (1994) point out, Cable's evidence for this seems weak. Cable has conflicting estimates as to the effects of proxy voting; the significance of proxy voting depends on the specification. There is weak evidence of the effects of board membership. Overall, there are no strong affects of banks detected.

Edwards and Fischer (1994) argue that: "Cable's study provides considerably more support for the view that what is distinctive about German AGs is their typically concentrated share ownership, which means that there are incentives for large shareholders to monitor management carefully, and so improve profitability" (p. 226). From the point of view of our results above, this conclusion seems wrong. Our results are in agreement with Cable's interpretation of his results. Our results suggest that banks are

special: they affect firm performance in a way which cannot be attributed to their role as blockholders. Blockholders have no affect on performance in the 1974 sample.

E) Changes in German Corporate Finance Between 1974 and 1985

Our results for the effects of bank equity ownership on firm performance were very different for the 1974 sample and the 1985 sample. These differences are statistically significant. An F-test for the joint significance of the slope dummy variables for bank equity ownership (EB), bank proxy voting (VB), and the Herfindahl Index (Herf) gives: $F(147;430) = 1.930$; $p = 0.000$, indicating a significant difference.

These results are consistent with recent changes in German corporate finance between 1974 and 1985. We can identify three interrelated trends. These trends are similar to some recent changes in Japan (see Hoshi, Kashyap, and Scharfstein (1990b, 1993)). The first important trend concerns disintermediation. Deutsche Bundesbank (May 1987) reported that: "In the last few years, financing though securities issues has increasingly taken the place of conventional bank credit."[36] The trend of disintermediation is also clear in the data. Deutsche Bundesbank (October 1992) reports that over the business cycle 1978-1989 the stock of liabilities of large companies to banks decreased from 13.7 to 7.6 as a fraction of total assets. This was caused almost completely by a decline in long-term liabilities to banks.[37] Reliance on bank loans by large firms has been replaced by "own funds," i.e., retained earnings. In addition, bond markets have become more important. See Kempf (1985).

The second trend is that bank equity ownership decreased over the period. Herrhausen (1987, p. 102) reports that the number of equity participations of the ten largest banks in Germany decreased from 129 to 86 during the period 1976-1986. Of the 43 instances of decreased holdings, 41 of those cases were instances where banks held more than 25 percent in 1976.[38] The trend towards smaller holdings by banks is also true in our data; see Table 3. But, while banks' equityholdings have declined, the Deutsche Bundesbank (May 1987) says that: "Banks are by far the most important category of institutional investor in Germany" (p. 24). This is due to banks' activity in the newly important bond markets. On average over the period 1970-1986, forty percent of bonds held in Germany were held by banks (see Deutsche Bundesbank (May 1987)). Moreover, Deutsche Bundesbank (April 1989):

The increase in the banks' purchases in the domestic bond market between 1978 and 1988 was accompanied by a tendency for the significance of loan business to decline. In terms of the absolute amount, lending to domestic non-banks went up from some DM 1.1 trillion to DM 2.2 trillion during this period (and thus almost doubled), but in relative terms it decreased from 57.5 percent of the volume of business at the end of 1978 to 55 percent at the end of 1988. This drop is attributable to short and medium-term lending. (p. 15)

The third important trend is increased competition between banks. Deutsche Bundesbank (April 1989) reports that:

Competition between banks has also been encouraged recently by the fact that major corporate customers in particular, given the marked improvement in their liquidity position and the sophisticated financial management techniques they use, no longer rely to the same extent as they used to on established and close accounting relationships with "principal bankers." At the same time, the various categories of banks are increasingly canvassing customers from outside their traditional clientele. Such competitive factors have tended to reduce the banks' potential earnings from "interest business" (p. 14).

Part of the competition for German banks has come from foreign banks (see Deutsche Bundesbank (April 1989) which describes "the massive influx of foreign banks").

VII. Banks and the Supervisory Board

The ability to influence firm performance may be related to membership on the firm's supervisory board which has important power in running the firm. In this subsection we examine bank representation of the firms's supervisory board.

The public, limited liability, companies in our samples have two boards of directors: the supervisory board (Aufsichtsrat) and the management board (Vorstand). The role of the supervisory board is to control management; it has the power to hire and fire management, set their compensation, regularly meet with management, and so on. Basically, the management board runs the day-to-day operations and is responsible to the supervisory board. The supervisory board oversees the management board, having the power to appoint and dismiss members of the management board and set their salaries. Under the codetermination law certain fractions of the supervisory board must consist of representatives of the employees for AGs with more than 2,000 employees. In that case, one half of the supervisory board consists of employee representatives and one half owner representatives (the chairman, who is elected by the board, breaks ties).[39]

Bank representation on supervisory boards has been almost as controversial as bank proxy voting power. The Monopolkommission (1980) found that commercial bank representatives accounted for 9.8 percent of all supervisory board members of the 100 largest AGs in 1978 and were represented on 61 of the top 100 boards. The largest three banks held 94 of the 145 bank representatives. Of the 74 officially quoted, large companies, in 1974, banks held seats on the supervisory boards of 59 out of the 74 companies (see Studienkommission (1979) and Krümmel (1980)).

Earlier we did not use the supervisory board representation of banks as an explanatory variable because the power which comes from board representation is power which is "derived" from voting rights. However, we are interested in knowing whether voting rights translates into supervisory board membership. It is important to stress that this is not necessary for firm performance to be affected by a bank relationship, though we are interested in whether it is a channel of influence.

For our analysis, the proportion of seats held by banks is taken as the endogenous variable. No honorary board members are taken into account. Appendix A provides detail on the data sources. We use the same independent variables as before except that we do not include the industry dummies and we include one more dummy for the 1974 sample and two more dummies for the 1985 sample, as follows. The dummy which is included in both samples is MM (Montan-Mitbestimmung) which is equal to one for those companies which are subject to Montan-Mitbestimmung (i.e., special codetermination rules for coal and steel companies).[40] Also, for this analysis we use a Herfindahl Index that excludes banks (HerfNB). Previously, we wanted to identify bank power as distinct from the power of nonbank blockholders, so we included banks in the Herfindahl Index (Herf). For the analysis of board seats, banks and nonbank blockholders may be in competition for seats. Therefore, we do not include banks in the index.

The dependent variable is a fraction, in particular bounded at zero, and there are indivisibilities which mean that the dependent variable is censored. We estimate a Tobit model. A drawback here is that the size of the board varies among firms and thus the indivisibilities may not have the same effect for all the firms.

The results for the pooled sample are shown in Table 9 (results are corrected for heteroskedasticity using Eicker (1967)-White (1980)). In both 1974 and 1985, of the equity ownership variables, bank equity is significant in determining the fraction of supervisory board seats that banks hold.[41] Note that Table 9 does not show results for the equity variables by year (by interacting these variables with time dummies as was done above). The reason is that the coefficients are not significantly different. A X^2 test for the joint significance of a dummy variable for the change in intercept and slope dummies for the EB, VB, and Herf gives: $X^2(4)=5.65$; $p=0.227$.

These results taken together with the previous results show why there may be so much controversy about the role of German banks. While bank board membership is observable and banks still have board membership to the extent that they own equity, in fact, the relationship between bank equity ownership and performance has changed. Interestingly, board membership was not as important in 1985 as it was in 1974.

VIII. Conclusion

Universal banking has been controversial for over a century because of the apparent concentration of power in banks. Banks not only own equity in firms, but have proxy voting rights which delegate to them the voting power of dispersed shareholders. This concentration of power in banks is in contrast to the workings of stock market economies. In those economies, where bank equity ownership in firms is limited and there is no proxy voting, disciplining of corporate managers occurs via takeovers. Takeovers require assembling blocks of stock through trading in the stock market. Our investigation has focused on the extent to which a bank relationship in Germany affects firm performance when the mechanism of takeovers is absent and banks appear powerful.

Our evidence shows that in 1974 German banks improved the performance of German firms to the extent that they held the firms' equity. This is consistent with the general view that universal banking is a substitute for a stock market in providing oversight of firm managements. We found no evidence of conflicts-of-interest concerning bank use of proxy votes. In fact, proxy votes had no impact on firm performance. The evidence for 1974 is consistent with the view that once German banks acquired blocks

of equity in firms, they had an incentive to oversee the management of these firms carefully because there was no liquid market for them to sell their stock (see Kahn and Winton (1995)). But, while this is true of all blockholders, our evidence shows that banks are special in affecting firm performance; they affect performance while nonbank blockholders do not.

In 1985, however, the world of German corporate finance is very different. Security markets are more developed and banks have reduced the extent of their blockholding. Our investigation of the 1985 sample shows that banks no longer have the same power or do not display their power in the same way with regard to firm performance. In 1985, blockholding affects performance, unlike in 1974. To the extent that banks are blockholders, they, like nonbank blockholders affect performance in 1985. It is difficult to say whether there is anything special about banks. In stock market economies the evidence suggests that bank loans and corporate bonds are different, making banks "special." This may or may not be true in Germany in 1985. But, we can say that the relationship between banks and firms is different in 1985 and 1974. An important caveat is that German corporate finance may still be in the process of change, making it difficult to say that our results for 1985 represent the current situation.

We also investigated the relationship between equity ownership structure and bank board seat membership. We found that while the relationship between firm performance and banks changed between 1974 and 1985, banks continued to hold supervisory board seats to the extent that they hold equity and proxy votes.

Appendix A: Data Sources

The 1974 Sample

The 1974 sample was constructed by selecting 88 usable public companies (Aktiengesellschaften) from the list of the top 100 firms published in Hauptgutachten II der Monopolkommission (Hauptguachten 1976/1977). The criteria for choosing the firms and ranking them is described in Hauptgutachen der Monopolkommission I (Hauptgutachten 1973/1975).

The 12 companies dropped and the reasons for their exclusion can be found in Appendix Table A1.1. The excluded firms include two firms (REWE-Zentrale AG, EDEKA Zentrale AG) which are a kind of cooperative ventures of merchants who together own the firm, two which are limited partnerships (KGaA), two companies which publish their annual reports according to bank accounting rules (since they are also banks), two companies in the process of restructuring, two companies with incomplete business year data, and two cases where the annual reports were not sufficiently detailed.

The accounting data on each firm is from Handbuch der deutschen Aktiengesellschaften, issues 1974/75, 1975/76, 1976/77, and 1977/78 (Verlag Hoppenstedt). Information on bank proxy voting comes from reports on annual meetings that took place in 1975 published in Hauptgutachten II der Monopolkommission (Hauptgutachten 1976/77). Information on the equity ownership structure is from Hauptgutachten der Monopolkommission I (Hauptgutachten 1973/75) and Handbuch der deutschen Aktiengesellschaften, issues 1974/75, 1975/76 which also provided the information about voting restrictions. Ownership structure is calculated for the year 1974.

The 1985 Sample

The 1985 sample is drawn from the list of the 100 largest (by sales, based on consolidated figures) German manufacturing firms (of all legal forms) published on October 3,1986 by the Frankfurter Allgemeine Zeitung. Thus, unlike the 1974 sample the 1985 sample contains no retailers, transport, or media companies. We followed Böhm (1992) in using this list because, as discussed below, Böhm (1992) is one of the sources for the bank proxy voting data. The list contains 66 stock companies. Of these we had to drop nine companies; Appendix Table A2.2 lists the companies dropped and the reasons for dropping them. Appendix Table A2.1 lists the companies included, their rank, and their rank in the 1974

sample.

Performance measures and debt interest burden were calculated based on the calendar years 1985 and 1986, averaging over these two years. Company data is from Handbuch der deutschen Aktiengesellshaften, issues 1987/1988 and 1988/89 (Verlag Hoppenstedt). This source also provided information about voting restrictions. Information on bank proxy voting comes from three sources: Gottschalk (1988), Böhm (1992), and our own survey of annual meeting reports (procured from provincial authorities in the province where the company is chartered) which corrected and supplemented the other sources. Proxy voting data is based on the presence lists of annual meetings which took place in calendar year 1986.

The equity ownership structure of German firms is not consistently reported by any single source. For the year 1985 we used three sources: the Commerzbank handbook "Wer gehört zu Wem" (15 edition, Düsseldorf 1985); Handbuch der deutschen Aktiengesellschaften, issues 1985/86 and 1986/87; and on the presence lists of firm annual meetings which we collected by hand.

Supervisory Board Membership Data

For the 1974 sample, data on board representation is taken (as in Edwards and Fischer (1994, pp. 198-210)) from Hauptgutachten II (1976/77) of the Monopolkommission. The 1985 data on board representation is taken from Böhm (1992, pp. 257-262) and from Handbuch der deutschen Aktiengesellschaften, 1986/87 and 1987/88 issues, ed. by Verlag Hoppenstedt, Darmstadt. The board representation data collected by Böhm refers to the year 1986.

Additional Notes

(1) Both samples are drawn based on size measures from consolidated reports. We had no control over this since we wanted to use the available proxy voting data which had already been collected based on these samples. However, the data about these firms comes from unconsolidated reports. Consolidated reports cover the company, itself, and also subsidiaries. But, the subsidiaries are often not 100 percent owned by the parent. In order to maintain a tight link between ownership and control, we focus on the company itself.

(2) In both samples, and for the analysis of supervisory boards, Kreditanstalt für Wiederaufbau and Bayerische Landesanstalt für Aufbaufinanzierung were not treated as banks because they are state-controlled special purpose banks (for reconstruction and development). The first one is a federal institution and the latter one is a Bavarian bank. In our sample they were treated as nonbanks controlled by the state. When we calculated the dummy variable for state-dominated firms we treated indirect state ownership as direct ownership when: (1) equity was held by these banks; (2) utility companies were subsidiaries of state-owned utility companies.

(3) Calculation of bank equity ownership also includes indirect ownership if these indirect holdings were acquired by pure holding companies (Vermögensverwaltungsgesellschaften).

Appendix B: Accounting Computations

This Appendix very briefly indicates how we calculated total assets, Eigenkapital (equity capital), debt, the performance measures and the interest burden on debt. For details on the German accounting rules which apply to our samples see Coenenberg (1974, 1993) and Ordelheide and Pfaff (1994).

Calculation of Eigenkapital (EK)

Eigenkapital is equity in book value terms, i.e., the excess of assets over (nonequity) liabilities (Fremdkapital). It was calculated as follows:

Grundkapital (Nominal Capital)

+ Zur Durchführung der beschlossenen Kapitalerhöhung geleistete Einlagen (Money given to the firm for the purpose of increasing nominal capital—which has not yet happened)

+ Stille Einlagen (money of a silent partner)

+ Rücklagen (reserves)

+ Heimfallverpflichtung (earnings retained for the mandatory equity repurchase)

+ von der öffentlichen Hand bedingt zur Verfügung gestellte Mittel (state infusion of equity capital)

- Rücklagen für Lastenausgleichsvermögensabgabe (Reserves for LAG)

+ 0.5 × Sonderposten mit Rücklageanteil (Special Reserves)

+ 0.5 × passivierte Zuschüsse (Subsidies obtained and put on the balance sheet)

+ im nächsten Geschäftsjahr ausgewiesener Gewinnvortrag (Balance sheet profit which was not paid out)

- Bilanzverlust (Balance sheet loss)

- Rücklagen für eigene Anteile (Reserves held against own equity).

Reserves for LAG refers to a law which was passed after WWII concerning the currency reform. It is a claim of the federal government on the company stemming from post-WWII reconstruction. It is repaid in installments until it expires. Firms can voluntarily make provisions for these payments. These provisions come from after-tax profit. LAG only affects the 1974 sample since it then expired prior to 1985. "Own equity" is rare and is always a small amount. We subtract this because it is listed as an asset since the firm has to hold reserves against this item. Two positions are multiplied by 0.5; this is

because these items have not been taxed yet. The tax rate of 0.5 is not the legislated tax rate. The effective tax rate is not known since it depends on actual income and is affected by income smoothing via declaration of provisions. We follow the usual academic and practioner procedure and use 0.5.

Calculation of Fremdkapital (FK)

Fremdkapital (nonequity liabilities) is calculated as follows:

Rücklagen für Lastenausgleichsvermögensabgabe (LAG reserves)

+ 0.5 × Sonderposten mit Rücklageanteil (goes to the government when taxed)

+ 0.5 × passivierte Zuschüsse (goes to the government when taxed)

+ Rückstellungen (Provisions for losses and pensions)

+ Genußscheine (participation certificates; if not included inposition Debt Liabilities below)

+ Namensgewinnscheine (registered participation certificates)

+ Wandelanleihen (Convertible bonds; if not included in Debt Liabilities, below)

+ Verbindlichkeiten (Debt liabilities with a stated maturity)

+ Passiver Rechnungsabgrenzungsposten (adjustment provision).

- Disagio

Participation certificates (Genußscheine and Namensgewinnscheine) are a kind of preferred stock in that the owner is guaranteed a low interest rate, but also receives some residual income, depending the company's profit. Legally, the company can choose the conditions under which residual profit is paid and there are many variations. In some cases, these liabilities are very similar to preferred stock, while in other cases they are close to bonds with fixed interest payments. Wandelanleihen are bonds which give the holder the option to convert into equity after a certain date (i.e., convertible bonds). We regard this item as debt, the same way we treat Genußscheine and Namensgewinnscheine, in the sense of being securities which have both debt and equity-like features. Genußscheinkapital is a liability that lies between Eigenkapital and debt. Usually, there is a low interest rate guaranteed and at the same time there is a profit-dependent component. Thus, Genußscheinkapital is different from firm to firm since there are no specific legal rules. Fortunately, only a few companies have this type of liability. Namensgewinnscheine are similar to Genußscheine. The former item only appears for BMW in the 1985 sample. The latter item only appears for Triumph in the 1974 sample and for Brown Boveri & Cie AG and Grundig AG

in the 1985 sample.

Calculation of Total Assets

Total Assets is obtained by adding the following positions to the sum of Eigenkapital and Fremdkapital.

Calculation of Equity Profits (EP)

To calculate what the equityholders will receive we begin with Jahresüberschuß and add back various items. The calculation is, briefly, as follows:

Jahresüberschuß (after tax profit before adjusting for changes in provisions, etc.)

+   gezahlte Steuern vom Einkommen, Ertrag und Vermögen (taxes on income and assets)

+   Aufwendungen aus Gewinnabführung (income channeled to other (mother) companies before taxation)

-    Erträge aus Verlustübernahmen (income obtained from other (mother) companies in order to cover losses)

-    Interest payments on Genußscheinkapital and Namensgewinnscheine, if these payments were taken from Jahresüberschuß.

For both the 1974 sample and the 1985 sample we add back taxes on income and assets. The reason is that before January 1,1977 earnings which were paid out were taxed differently than retained earnings. For consistency we also treat the 1985 sample in the same way. However, we did not add back the position "sonstige Steuern" ("other taxes") since they primarily contain indirect taxes which can be assumed to be passed on to consumers. This position contains, for example, the special tax on mineral oil. In the case of losses covered by other countries, the only relevant instances in the 1974 sample is Korf-Stahl AG and in the 1985 sample: Grundig AG. The case of income channeled to parent companies in order to cover losses occurs in the 1974 sample for Aral AG, Grundig AG, Axel Springer AG, and Triumph International AG; in the 1985 sample it occurs for Zeiss Ikon AG.

The second item, Aufwendungen aus Gewinnabführung, is added back since this is income which accrues to the company and not to the parent in the sense of performance. The last item, Erträge aus Verlustübernahmen, is subtracted because it is income which is not due to performance.

Calculation of the Interest Burden on Debt (Fremdkapital; INT)

Interest burden on debt uses the accounting position "interest and similar expense". Payments

on Genußscheinkapital were added to this position (and subtracted from Jahresüberschuß) if they were not already included.

Return Measures

The return on equity is: EP/EK. The return on total assets is: (EP + INT)/(FK + EK).

Appendix C: Equity Ownership Structure

In general, the equity ownership data are detailed enough to obtain a complete picture of the equity ownership structure. In particular, to calculate the Herfindahl Index we need to know, in addition to the details of bank equityholdings, the distribution of shares across nonbank blockholders and the percentage of shares which are dispersed. Table 3 shows some of the details of bank ownership, but to calculate the index we use data which is further disaggregated. In some cases, however, it was necessary to make some assumptions to complete the picture of equity ownership in order to calculate the index. We explain these assumptions here.

Assumptions

(1) In some cases holdings are reported as: > 25 percent; > 50 percent; >75 percent; < 25 percent; etc. In these cases, we made the following convention (unless other information could make determination of the holdings more precise): set > 25 percent equal to 26 percent; set > 50 percent equal to 51 percent; set > 75 percent equal to 76 percent; etc. The reported inequalities refer to cut-off points which are relevant for control purposes as discussed in Section II.E. In other words, if x is the fraction of shares held by the particular blockholder, > 25 percent means $0.50 > x > 0.25$.

(2) Assume that the banks vote all dispersed holdings if no other information can make this more precise. The bank proxy voting is originally reported as a percentage of votes in attendance at the actual meeting. Bank proxy voting at the annual meeting is taken to be dispersed shareholders' votes (though on rare occasions this is not true). But, what about the shareholders who did not show up at the annual meeting? We assume that these shareholders are dispersed. (Note that this assumption applies only to calculation of the Herfindahl Index and not to the fraction of bank proxy votes.)

An example will show how assumptions (1) and (2) were used. Let B_1 be the fraction of shares voted by blockholder 1 and B_2 the fraction voted by blockholder 2, etc. EB is the fraction owned by the banks and VB is the fraction voted in proxy. Suppose the data are that EB = 0, B_1 > 25 percent and B_2 = 10 percent, the rest are dispersed. The problem is that we do not know the exact size of B_1's holdings. If we had no other information, we would use assumption (1). However, from the proxy voting fraction that banks voted at the annual meeting we can calculate VB under assumption (2). Then

$B_1 = 1.00 - VB - 0.10$.

3) Dispersed holdings were assumed to correspond to decreasing fractions of ownership according to: 4 percent, 3 percent, 2 percent 1 percent. Small blockholdings are usually not reported.

Footnotes

1. In the U.S. banks are generally prohibited from holding common stock in nonfinancial corporations (according to The Banking Act of 1933). An exception to this rule occurs when the stock is obtained as a by-product of a workout of a distressed loan (this includes convertible securities). Having obtained common stock in a loan work-out there are limits on how long a bank may hold the stock. Until 1980, National banks could hold stock no longer than five years, but since then the limit has been ten years. See James (1993) for a discussion. There is, however, a strong incentive for U.S. banks not to hold stock obtained in a workout. Under U.S. bankruptcy law, the doctrine of equitable subordination holds that banks (or any creditor) that is found to exercise effective control over a debtor firm (via equityholdings, in particular) may have their claims reduced in priority relative to other lenders. This effectively prevents prolonged equityholding by U.S. banks and explains why nonbanks do not hold debt and equity simultaneously. In Japan, banks were allowed to hold up to ten percent of a firm's shares until 1987 when this was reduced to five percent.

2. Bank loans are typically collateralized and contain covenants which allow the bank bargaining power when loans are renegotiated in times of financial distress. When the firm is not in distress, banks cannot influence decisions. See Gorton and Kahn (1994). Hoshi, Kashyap, and Scharfstein (1990a) provide evidence of Japanese banks positively influencing the performance of distressed borrowers. Lummer and McConnell (1990), studying U.S. firms, show that loan renegotiations are the source of changes in firm value rather than the initial signing of the loan agreement.

3. In general, a "universal bank" is a firm which can not only issue demand deposits and use the proceeds originate and hold commercial and consumer loans, but can also underwrite, hold, and trade all other securities. In other words, a universal bank can conduct all the activities of both U.S. commercial banks and U.S. investment banks. The German Banking Act defines the activities which constitute banking (see Edwards and Fischer (1994), p. 98). With respect to takeovers, there have been only four hostile takeovers in Germany since WWII. See Franks and Mayer (1994) for details of three of these takeovers.

4. Another distinction between the two systems concerns compensation contracts for managers and directors. In stock market economies management compensation often takes the form of shares of stock in the company or options on the company's stock. Insofar as stock prices reflect the performance of management, these compensation contracts can create incentives for managers to behave in the interests of outside shareholders by aligning the incentives of insiders with those of outside equityholders. In Germany managers and directors are not compensated with stock or options and do not hold significant amounts of stock.

5. What are now known as "agency problems" when there is a separation of ownership and control were first discussed in the German context by Steinitzer (1908).

6. A typical view is expressed by Otto Graf Lambsdorff, economics spokesman of the (German) Free Democratic Party:

> If you look at what the big German banks, taken together, control -- the shareholdings themselves, the supervisory board seats, the proxy voting rights -- then it amounts to a concentration of economic power and influence which is largely beyond the reach of any outside control and which can lead to dangerous developments and abuse of power. (Financial Times, July 29, 1994)

7. The figures shown in Table 1 are, of course, slightly sensitive to the year chosen. The market value of shares of domestic companies as a percentage of GDP in 1992 was 20.3 percent in Germany and 77.3 percent in the U.S. In 1992, in the U.S. there were more than 6,000 listed companies while in Germany there were less than 650.

8. While Frankfurt is the principal stock market (and has 60-70% of total German volume), substantial trading also occurs in Düsseldorf. There are also exchanges in Hamburg, Stuttgart, Munich, Berlin, Bremen, and Hanover. See Huang and Stoll (1991).

9. In particular, Japan is governed by a Glass-Steagal-type distinction between commercial and investment banks, though Japanese banks area allowed to hold limited amounts of equity. See note 1 above.

10. This statement depends on how international comparisons are made. Comparing balance sheet data suggests that German firms are more highly levered and borrow more from banks. For example, using balance sheet data for the end of 1983, bank borrowing was 25 percent of total assets in the U.K. and 61 percent of total assets in Germany (see Bank of England (1984)). But, Mayer (1990) and Edwards and Fischer (1994) argue that comparisons based on flows of funds are more accurate.

11. The year 1978 is chosen as representative since it is roughly midway between the dates of our two samples: 1974 and 1985. For more current information see Edwards and Fischer (1994).

12. The legal forms of business enterprises are the corporate form (which always has limited liability) and partnerships (which may have limited liability). The corporate form consists of public limited liability companies (Aktiengesellschaften (AGs)). The most important partnerships which are private, limited liability, companies are Gesellschaften mit beschränkter Haftung (GmbHs), Kommanditgesellschaften (KGs and KGaAs), or Offene Handelsgesellschaften (OHGs). Kommanditgesellschaften auf Aktien (KGaAs) are a hybrid form between a corporation and a private partnership. Stock is issued by KGaAs and AGs. In this paper we concentrate on the public limited companies, AGs. AGs most commonly issue bearer shares which explains why shares individuals usually hold their shares on deposit at banks.

13. Herfindahl indices are often used to capture the importance of block shareholding, e.g., Demsetz and Lehn (1985) and Cable (1985). Recall that the Herfindahl Index is defined as: $H = \Sigma s_i^2$, where s_i is the fraction of stock owned by the ith agent. Thus, if there is a single agent who owns all the stock $H = 1$. For example, two agents each owning half would result in: $H = (0.5)^2 + (0.5)^2 = 0.5$.

14. This includes firms listed on the New York Stock Exchange, the American Stock Exchange and Over-the-Counter firms; a total of 5,240 firms.

15. Studienkommission [a government commission] (1979, p. 87) reports that 559 of the 662 bank equity participations which were observed at the end of 1974 (they sent out a questionnaire and only considered cases where 10 percent or more was held), were acquired after the year 1948. Most of these holdings were acquired after 1960. In the period 1970-1974, 250 holdings were acquired. This information contradicts a widely cited article in The Economist (November 16,1991, p. 102) which reports (without giving a source) that most of the stockholdings of German banks were acquired in the 1920s and 1930s through troubled debt restructurings. Herrhausen (1987, p. 107, Table 3) presents some information on why banks hold equity. He considers 20 acquisitions of the ten largest private banks which took place in the period 1976-1986. Only seven of these companies were traded at the stock exchange at this time.

The reasons mentioned by these banks were: long-term investment (six cases), short-term investment (five cases), support of medium sized companies which are weakly endowed with capital (five cases), credit rescue measure (one case), antitakeover measure (one case), other reasons (two cases).

16. Agreement is given in writing and lasts for fifteen months. Shareholders can instruct the bank how to vote, if they wish, but this must be in writing.

17. Voting restrictions became fashionable in the 1970s when Middle Eastern countries were looking for investment opportunities for their oil dollars and started to acquire stakes in German companies. Thus, as shown in the table, most of the restrictions were adopted in the 1970s.

18. Note that a blockholder cannot split his shares between several banks to circumvent this restriction.

19. Even if the goal of bank equityholders were to maximize the value of the firms which the bank has invested in, the banks, themselves, are controlled by managers. Managers of the Big Three banks may be entrenched since the Big Three control a majority of their own votes at annual meetings (see Gottschalk (1988)). Bankers may exert influence over firms in which the bank has voting power, but their influence may not be in the interests of either the bank's shareholders or nonbank shareholders in the firm. Bankers may be able to extract private benefits from the firms that the bank has some power over. Potential private benefits to the bankers include board seats which confer benefits on the individuals holding the seats.

20. In a theoretical model, Stulz (1988) predicts such a nonlinear relationship between insider ownership and firm value. Also, see Gorton and Rosen (1994).

21. See Demsetz and Lehn (1985), Mikkelson and Ruback (1985), Holderness and Sheehan (1985), Barclay and Holderness (1990), and Zeckhauser and Pound (1990).

22. Kaplan (1993), however, uses stock data from 41 German companies to study executive turnover as a function of stock price performance in the 1980s.

23. Until the year 1988 there were two kinds of over-the-counter stock trading in Germany. The first kind is called "Geregelter Freiverkehr" (regular over-the-counter trading) and "Ungeregelter Freiverkehr" (irregular over-the-counter), also called "Außerbörslicher Handel" (traded any time, usually on the phone and among banks). (The first version no longer exists.) The problem with these two kinds of over-the-counter trading is that for stock traded in "Geregelter Freiverkehr" there are only so-called span-prices (200/210 for example) published, while in "Ungeregelter Freiverkehr" prices are only available for days on which stock is actually traded. Another issue concerns the liquidity of these markets which also affects stock prices.

24. All classes of shares must be taken account of since the existence of multiple classes of shares affects the value of the firm. See Grossman and Hart (1988).

25. The list of the largest 100 companies is based on the sales of the consolidated firms. We analyze the unconsolidated reports. See Appendix A.

26. In the 1985 sample the companies were ranked by sales, based on the consolidated figures. In the 1974 sample the companies were also ranked by sales, again based on consolidated figures, but there are two peculiarities. Firstly, for retailers only 75 percent of the sales were taken into account. Secondly,

for construction companies "Bauleistung" was used instead of sales. "Bauleistung" is simply what corresponds to sales for manufacturers.

27. Note that ordinary least squares regression of P on X alone would consistently and efficiently estimate β if E(X f(EB, VB, H)) = 0; for example, when E(X) = 0 and X is statistically independent of EB, VB, and H. This condition is not satisfied in our samples, nor would one expect it to be, i.e., bank involvement and the equity ownership structure are related to industry characteristics (particularly for state owned firms). Also, our focus is not on the coefficient β, but on the nonlinear component.

28. In general, the smoother matrix, K, may be linear or nonlinear (e.g., a low order polynomial) and possible methods include kernel, weighted regression, and spline procedures. (See Härdle (1990, 1991) and Müller (1987, 1988) for discussions.) The choice of locally weighted regression over the other methods is due to the superior features of this method compared to kernel estimation. Local regression is more efficient than kernel methods and does not have "boundary effects" caused by the lack of a neighborhood on one side of data points near either end of the sample. These results are due to Fan (1992, 1993); also see Stute (1984) and Cuzick (1992).

29. Mallows' C_p (Mallows (1973)) is a technique for model selection which was originally presented as a way to select between various parametric specifications. The C_p statistic is defined by:

$$C_p = (1/s^2) \, RSS_p - n + 2p$$

where RSS_p is the residual sum of squares for candidate model P, p is the number of parameters for model P, n is the number of observations, s^2 is an estimate of the model variance. C_p is an estimate of the predictive accuracy of the model scaled by the sum of squared errors. If model P is correct, then C_p will be close to p. Mallows plotted C_p versus p to determine the best specification. In our context, Cleveland and Devlin (1988) extended C_p to the nonparametric context and provided the distribution of C_p so that choice of the smoothing parameter could be made on a statistical basis.

30. The smoothing parameter, g, is: g = q/n where n is the sample size and q is the number of observations included in the neighborhood for each point. For local regression (or nearest neighbor regression) bias and variance as q $\rightarrow \infty$, n $\rightarrow \infty$, and g $\rightarrow$ 0 are given by:

$$E[\gamma_g(z)] - f(z) \approx \frac{1}{24 h(z)^3} [(f''h + 2f'h')(z)]g^2$$

$$Var[\gamma_g(z)] \approx \frac{\sigma^2(z)}{g}$$

where h(z) is the marginal density of z. See Härdle (1991). Observe that the bias is increasing and the variance is decreasing in the smoothing parameter g.

31. The M-statistic can be negative. See Cleveland and Devlin (1988).

32. The M-statistic does not directly test one specification against another. In other words, it is not directional. This is alright for our purposes since we are not testing against a particular alternative hypothesis. See Whang and Andrews (1993) for a discussion of directional tests in the semiparametric context.

33. We begin with g = 0.5 because for g < 0.5 there is not enough variation in the data and the procedure breaks down.

34. The results are the same if instead of treating the banks as a single agent they are treated separately or if the Herfindahl index of bank equity ownership is used. Also, firm leverage is never significant if used as an independent variable in a return on equity equation, confirming our view that leverage is endogenous. These two additional results are also true in the 1985 sample.

35. Cable (1985) studies a sample of 48 large AGs which he (inexplicably) reports as information from 1970. He averages other variables over the period 1968-1972.

36. Note that since banks play the central role in the securities business, this does not imply that banks became less profitable. Deutsche Bundesbank (May 1987) reports that: " In recent years the traditional areas of issuing business and securities business, in particular, have been marked by very rapid growth and have therefore developed into an important source of income for the banking industry" (p. 24).

37. Short-term bank debt of large firms was unchanged over the period. Small enterprises' dependence on bank loans increased. See Deutsche Bundesbank (October 1992).

38. Herrhausen (1987, p. 102, footnote 7) says that these figures are based on direct and indirect ownership of participations of a nominal value of at least 1 million Deutsche Marks and of at least 10 percent of equity.

39. There are special rules which apply to the coal and steel industries. Equal representation on supervisory boards was introduced in the coal and steel industry (so-called Montanindustrie) in 1951. It was modified in 1956. This kind of codetermination is called Montan-Mitbestimmung while the word Montan stands for coal and steel and Mitbestimmung means codetermination. In 1976 equal representation on supervisory board was extended to all other industries. However, in the coal and steel industry codetermination is still a bit different from the other industries. In our 1974 sample there are 16 companies with Montan-Mitbestimmung while in our 1985 sample there are six such companies. See Wiedemann (1980) for more detail on how Montan-Mitbestimmung differs from regular codetermination.

40. Except for coal and steel (where Montan-Mitbestimmung still applies) the supervisory board consists of an equal number of representatives of the owners and of representatives of the employed. The chairman, elected by the board, can break ties.) For the 1974 sample, this law does not apply yet. In the 1985 sample we include a dummy variable MD (Mitbestimmung, Drittel, i.e., one third of the board is employees) which is equal to one for two companies (AGIV AG für Industrie und Verkehrswesen and Contigas AG). The number of people employed by this firm does not require equal representation. Only one third of the members of the supervisory board of this company are representatives of the employees.

41. The regression results presented by Edwards and Fischer (1994, p. 198-210) use the same underlying data set on supervisory board membership as we do and as Cable (1985) did for the 1974 sample. However, the dependent variable and the sample in our analysis will differ from Edwards and Fischer (1994) in ways which turn out to be important. First, Edwards and Fischer restrict their sample to those stock corporations (51 firms) for which bank voting (EB plus VB) exceeds 5 percent (measured relative to actual presence at the annual meeting of 1975). The Monopolkommission reports the voting rights of banks only for those companies with a value of EB plus VB of more than 5 percent (relative to actual presence). However, the remaining firms have only very little or no dispersed shares (and thus a value

of VB which is zero or very close to zero). The value of EB for these firms is also either equal to zero or very close to zero (negligible) since many of these firms are owned by families, domestic, or foreign companies. For this reason we did not restrict ourselves to those 51 companies which Edwards and Fischer use. Another issue with the Edwards and Fischer (1994) results is that they use the absolute numbers of seats as the endogenous variable. However, the total number of seats on the supervisory board in their sample of 51 companies (we know which firms they took) varies between 3 (for Triumph International AG) and 21 (for August Thyssen-Hütte AG, for example). (See Verlag Hoppenstedt, Handbuch der deutschen Aktiengesellschaften, 1974/75 and 1975/76 issues, Darmstadt.)

References

Bank of England (1984), "Business Finance in the United Kingdom and Germany," Quarterly Bulletin 24(3) (September), 368-375.

Barclay, Michael and Clifford Holderness (1990), "Negotiated Block Trades and Corporate Control," University of Rochester, working paper.

Böhm, Jürgen (1992), Der Einfluß der Banken auf Großunternehmen (Hamburg: Steuer- und Wirtschaftsverlag).

Cable, J. R. (1985), "Capital Market Information and Industrial Performance: The Role of West German Banks," Economic Journal 95, 118-132.

Cleveland, William S. (1979), "Robust Locally Weighted Regression and Smoothing Scatterplots," Journal of the American Statistical Association 74, 829-836.

Cleveland, William S. and Susan J. Devlin (1988), "Locally Weighted Regression: An Approach to Regression Analysis by Local Fitting," Journal of the American Statistical Association 83, no. 403 (September), 596-610.

Cleveland, William S., Susan J. Devlin and Eric Grosse (1988), "Regression by Local Fitting," Journal of Econometrics 37, 87-114.

Coenenberg, A.G. (1974), Jahresabschluß und Jahresabschlußanalyse (München: Verlag Moderne Industrie).

Coenenberg, A.G. (1993), Jahresabschluß und Jahresabschlußanalyse, 14 edition (Landsberg am Lech: Verlag Moderne Industrie).

Cuzick, Jack (1992), "Efficient Estimates in Semiparametric Additive Regression Models With Unknown Error Distribution," Annals of Statistics 20, No. 2, 1129-1136.

Demsetz, Harold and Kenneth Lehn (1985), "The Structure of Corporate Ownership: Causes and Consequences," Journal of Political Economy 93(6), 1155-1177.

Deutsche Bundesbank (1980), Statistische Beihefte zu den Monatsberichten der Deutschen Bundesbank, Reihe 1: Bankenstatistik nach Bankengruppen, Dezember.1980, Nr. 12.

Deutsche Bundesbank (1984), "The Share Market in the Federal Republic of Germany and its Development Potential," Monthly Report (April), 11-19.

Deutsche Bundesbank (1987), "Longer-term Trends in the Banks' Investments in Securities," Monthly Report (May), 24-33.

Deutsche Bundesbank (1989), "Longer-term Trends in the Banking Sector and Market Position of the Individual Categories of Banks," Monthly Report (April), 13-22.

Deutsche Bundesbank (1992), "Longer-term Trends in the Financing of West Germany Enterprises," Monthly Report (October), 25-39.

Edwards, Jeremy and Klaus Fischer (1994), Banks, Finance and Investment in Germany (Cambridge University Press).

Eicker, F. (1967), "Limit Theorems for Regressions with Unequal and Dependent Errors," in L. Le Cam and J. Neyman, eds., Proceedings of the Fifth Berkeley Symposium on Mathematical Statistics and Probability (University of California Press, Berkeley) 1, 59-82.

Fan, Jianqing (1992), "Design-adaptive Nonparametric Regression," Journal of the American Statistical Association 87, No. 420, 998-1004.

Fan, Jianqing (1993), "Local Linear Regression Smoothers and Their Minimax Efficiencies," Annals of Statistics 21, No. 1, 196-216.

Fowlkes, E.B. (1986), "Some Diagnostics for Binary Logistic Regression Via Smoothing" (with discussion), in Proceedings of the Statistical Computing Section, American Statistical Association, 54-64.

Franks, Julian and Colin Mayer (1994), "The Ownership and Control of German Corporations," working paper, London Business School and University of Oxford.

Goergen, Marc (1995), "The Evolution of Ownership and Control in German IPOs," Keble College and School of Management Studies, Oxford University, working paper.

Gorton, Gary and James Kahn (1993), "The Design of Bank Loan Contracts, Collateral, and Renegotiation," Wharton School, working paper.

Gorton, Gary and Richard Rosen (1994), "Corporate Control, Portfolio Choice, and the Decline of Banking," Journal of Finance, forthcoming.

Gottschalk, A. (1988), Der Stimmrechtseinfluß der Banken in den Aktionärsversammlungen der Großunternehmen, WSI-Mitteilungen 41, 294-304.

Grossman, Sanford and Oliver Hart (1980), "Takeover Bids, the Free-Rider Problem, and the Theory of the Corporation," Bell Journal of Economics, Vol. 11(1), 42-64.

Grossman, Sanford and Oliver Hart (1988), "One Share-One Vote and the Market for Corporate Control," Journal of Financial, Vol. 20(1/2), 175-202.

Grundfest, Joseph (1990), "The Subordination of American Capital," Journal of Financial Economics 27, 89-116.

Härdle, Wolfgang (1990), Applied Nonparametric Regression (Cambridge University Press).

Härdle, Wolfgang (1991), Smoothing Techniques (New York: Springer-Verlag).

Harris, Trevor, Mark Lang, and Hans Peter Möller (1994), "The Value Relevance of German Accounting Measures: An Empirical Analysis," Journal of Accounting Research 32, 187-209.

Herrhausen, Alfred (1987), "Kontroverse über die Macht der Banken," Verbraucherpolitische Hefte 5/1987, 99-109.

Hilferding, Rudolph (1910), Das Finanzkapital (Berlin: Dietz).

Holderness, Clifford and Dennis Sheehan (1988), "The Role of Majority Shareholders in Publicly Held Corporations," Journal of Financial Economics 20, 317-346.

Hoshi, Takeo, Anil Kashyap, and David Scharfstein (1990a), "The Role of Banks in Reducing the Costs of Financial Distress in Japan," Journal of Financial Economics 27, 67-88.

Hoshi, Takeo, Anil Kashyap, and David Scharfstein (1990b), "Bank Monitoring and Investment: Evidence From the Changing Structure of Japanese Corporate Banking Relationships," in Asymmetric Information, Corporate Finance, and Investment, ed. by Glenn Hubbard (University of Chicago Press; Chicago).

Hoshi, Takeo, Anil Kashyap, and David Scharfstein (1991), "Corporate Structure, Liquidity, and Investment: Evidence From Japanese Industrial Groups," Quarterly Journal of Economics, Vol 106(1), 33-60.

Hoshi, Takeo, Anil Kashyap, and David Scharfstein (1993), "The Choice Between Public and Private Debt: An Analysis of Post-Deregulation Corporate Financing in Japan," University of Chicago, working paper.

Huang, Roger and Hans Stoll (1991), Major World Equity Markets: Current Structure and Prospects for Change (New York University Monograph Series 1991-3).

James, Christopher (1993), "When Do Banks Take Equity? An Analysis of Bank Loan Restructurings and the Role of Public Debt," University of Florida, working paper.

Jensen, Michael and Richard Ruback (1983), "The Market for Corporate Control: The Scientific Evidence," Journal of Financial Economics 11, 5-50.

Kahn, Charles and Andrew Winton (1995), "Ownership Structure, Liquidity Demand, and Shareholder Monitoring," Northwestern University, working paper.

Kaplan, Steven (1993), "Top Executives, Turnover and Firm Performance in Germany," National Bureau of Economic Research, Working Paper #4416.

Kempf, Uta (1985), German Bond Markets (Euromoney Publications: London).

Krümmel, Hans-Jacob (1980), "German Universal Banking Scrutinized: Some Remarks Concerning the Gessler Report," Journal of Banking and Finance 4, 33-55.

Lummer, Scott and John McConnell (1990), "Further Evidence on the Bank Lending Process and the Capital Market Response to Bank Loan Agreements," Journal of Financial Economics 25, 99-122.

Mallows, C.L. (1973), "Some Comments on C_p," Technometrics 15, 661-675.

Mayer, Colin (1990), "Financial Systems, Corporate Finance, and Economic Development," in Glenn Hubbard, ed., Asymmetric Information, Corporate Finance, and Investment (University of Chicago Press; Chicago and London).

McConnell, John and Henri Servaes (1990), "Additional Evidence on Equity Ownership and Corporate Value," Journal of Financial Economics 27, S. 595-612.

Mikkelson, Wayne and Richard Ruback (1985), "An Empirical Analysis of the Interfirm Investment Process," Journal of Financial Economics 14, 523-553.

Monopolkommission (1977), Hauptgutachten I (1973/75), Mehr Wettbewerb ist möglich (Baden-Baden: Nomos).

Monopolkommission (1978), Hauptgutachten II (1976/77), Fortschreitende Konzentration bei Großunternehmen (Baden-Baden: Nomos).

Monopolkommission (1980), Hauptgutachten III (1978/79), Fusionskontrolle bleibt vorrangig (Baden-Baden: Nomos).

Morck, Randall, Andre Shleifer and Robert Vishny (1988), "Management Ownership and Market Valuation: An Empirical Analysis," Journal of Financial Economics 20, S. 293-315.

Müller, H.G. (1987), "Weighted Local Regression and Kernel Methods for Nonparametric Curve Fitting," Journal of the American Statistical Association 82, 231-238.

Müller, H.G. (1988), Nonparametric Analysis of Longitudinal Data (Berlin: Springer-Verlag).

Ordelheide, Dieter and Dieter Pfaff (1994), Germany, European Financial Reporting Series (Routledge, New York and London).

Porter, Michael (1992), "Capital Choices: Changing the Way America Invests in Industry," Journal of Applied Corporate Finance 5(2), 4-16.

Shleifer, Andrei, and Robert Vishny (1986), "Large shareholders and corporate control," *Journal of Political Economy* 94, 461-88.

Speckman, Paul (1988), "Kernel Smoothing in Partial Linear Models," Journal of the Royal Statistical Association, B 50, no. 3, 413-436.

Steinitzer, Erwin (1908), Ökonomische Theorie der Aktiengesellschaft (Berlin: Duncker und Humblot).

Studienkommission (1979) Bericht der Studienkommission "Grundsatzfragen der Kreditwirtschaft". Schriftenreihe des Bundesministeriums für Finanzen, Heft 28, Bonn: Stollfuß.

Stulz, Rene (1988), "Managerial Control of Voting Rights," Journal of Financial Economics 20, 25-54.

Stute, Winfried (1984), "Asymptotic Normality of Nearest Neighbor Regression Function Estimates," Annals of Statistics 12, N0. 3, 917-926.

United Nations (1990), "International Standard Industrial Classification of All Economic Activities," Statistical Papers, Series M, No. 4, Rev. 3., New York.

Whang, Yoon-Jae and Donald Andrews (1993), "Tests of Specification for Parametric and Semiparametric Models," Journal of Econometrics 57, S. 277-318.

White, Halbert (1980), "A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity," Econometrica 48, 817-838.

Wiedemann, Herbert (1980), "Codetermination By Workers in German Enterprises," The American Journal of Comparative Law, Vol. 28, p. 79-82.

Zeckhauser, Richard and John Pound (1990), "Are Large Shareholders Effective Monitors? An Investigation of Share Ownership and Corporate Performance," in Asymmetric Information, Corporate Finance, and Investment, edited by Glenn Hubbard (University of Chicago Press).

Table 1
International Stock Exchanges and Banking Systems, 1986

	Stock Exchanges					Banking Systems	
City of Major Stock Exchange and Country of Banking System	Market Value of Shares of Listed Domestic Companies (DM bil.)	Market Value of Shares as a Percentage of GDP (%)	Total # of Listed Companies	% of Listed Companies which are Domestic (%)	Turnover Ratio[1] (%)	Bank Total Assets as a % of GDP	Bank Claims on Private Sector as a % of GDP[2]
Amsterdam, Holland	146.1	43.8	474	48.9	93.16	139	69
Brussels, Belgium	51.4	31.0	336	57.1	27.63	169	28
Germany[3]	452.3	25.7	649	72.7	73.14	132	86
Italy[3]	144.0	15.3	147	100.0	70.14	65	32
London, England	870.0	166.2	2,688	78.7	60.00	188	37
New York, NY	4,633.8	45.7	1,541	96.5	57.56	59	43
Paris, France	194.7	19.0	678	72.1	60.00	75	44
Tokyo, Japan	2,334.0	80.4	1,497	98.6	83.62	128	100
Vienna, Austria	11.3	6.3	102	62.8	26.55	164	61
Switzerland[3]	207.0	85.0	315	41.6	190.68	236	146

[1] Total volume traded divided by market value of all shares. Excludes bonds.

[2] Excludes claims on Government, official entities, other financial institutions, reserves.

[3] Includes all major stock exchanges.

Source: Federation of the German Stock Exchanges, Annual Report, 1986; International Financial Statistics.

Table 2

Patterns of Share Ownership
(Percentages of Total)

Sector	1960		1970		1980		1985		1990	
	Germany	U.S.	Germany	U.S.	Germany	U.S.	Germany	U.S.	Germany	U.S.
Households[1]	27.0	87.7	28.0	80.4	19.0	74.7	18.0	62.4	17.0	52.5
Enterprises[2]	44.0	3.5	41.0	4.6	45.0	2.8	43.0	4.9	42.0	6.9
Public Authorities	14.0	0.0	11.0	0.0	10.0	0.0	9.0	0.0	5.0	0.0
NonResidents	6.0	2.1	8.0	3.0	11.0	3.9	13.0	4.9	14.0	6.6
Banks	6.0	0.0	7.0	0.0	9.0	0.0	8.0	0.0	10.0	0.0
Insurance Cos. & Private Pension Funds	3.0	6.6	4.0	11.7	6.0	18.3	9.0	27.6	12.0	33.7
Total	100.0	99.9	99.0	99.7	100.0	99.7	100.0	99.8	100.0	99.7

Discrepancies are due to rounding.
[1] Consumer & nonprofit for U.S.
[2] Open-end investment companies and brokers and dealers for U.S.

Source: U.S. Flow of Funds; Monthly Report of the Deutsche Bundesbank, October 1991.

Table 3
Equity Ownership & Proxy Voting

	1974 Sample	1985 Sample
Total Bank Equity Ownership		
mean (median)	0.083 (0.000)	0.049 (0.000)
standard deviation (min, max)	0.177 (0.000, 0.676)	0.108 (0.000, 0.440)
$0.00 \leq x \leq 0.25$	73	53
$0.25 < x \leq 0.50$	9	4
$0.50 < x \leq 0.75$	6	0
$0.75 < x \leq 1.00$	0	0
Total Bank Proxy Voting		
mean (median)	0.209 (0.103)	0.192 (0.146)
standard deviation (min, max)	0.278 (0.000, 0.900)	0.219 (0.000, 0.817)
$0.00 \leq x \leq 0.25$	62	39
$0.25 < x \leq 0.50$	12	12
$0.50 < x \leq 0.75$	5	5
$0.75 < x \leq 1.00$	9	1
Herfindahl Index Including Banks[1]		
mean (median)	0.457 (0.364)	0.421 (0.286)
standard deviation (min, max)	0.343 (0.003, 1.0)	0.362 (0.003, 1.0)
Herfindahl Index Without Banks		
mean (median)	0.430 (0.360)	0.412 (0.286)
standard deviation (min, max)	0.365 (0.003, 1.0)	0.369 (0.003, 1.0)
Hefindahl Index With Banks Only[1]		
mean (median)	0.026 (0.0)	0.009 (0.0)
standard deviation (min, max)	0.066 (0.0, 0.410)	0.027 (0.0, 0.160)
Multiple Banks Owning Equity number of firms (% of sample) with more than one bank owning equity and each of these banks owning: at least 5 percent	6 (.07)	3 (.05)
at least 10 percent	5 (.06)	1 (.02)
at least 25 percent	4 (.05)	0 (0.0)
Nonbank Blockholders number of firms with a nonbank blockholder holding at least 25%	70	46
Sample Size		
total number of firms	88	57

[1] Index treats individual banks as separate equityholders.
Source: See Appendix A.

Table 4
Voting Restrictions

	Voting rights of a single investor are restricted to:	Year Introduced
BASF AG	80 million Deutsche Marks of equity (face value)	1975
Bayer AG	5 percent	1975
Continental Gummiwerke AG	5 percent	1984
Hoesch AG	15 percent	1977
Linde AG	10 percent	1973
Mannesmann AG	5 percent	1975
Schering AG	12 million Deutsche Marks of equity (face value)	1973
Volkswagenwerk AG	2 percent/20 percent	1960/1970

Source: Verlag Hoppenstedt, Handbuch der deutschen Aktiengesellschaften, various issues, Darmstadt.

Table 5
Firm Characteristics

	1974 Sample	1985 Sample
Total Assets (in billions of DM)		
mean	2.200	5.385
(median)	(1.239)	(3.134)
standard deviation	2.608	6.648
(min, max)	(0.164, 12.337)	(0.124, 36.528)
Return on Assets		
mean	0.082	0.087
(median)	(0.083)	(0.081)
standard deviation	0.048	0.064
(min, max)	(-0.059, 0.198)	(-0.063, 0.233)
Return on Equity		
mean	0.159	0.208
(median)	(0.168)	(0.174)
standard deviation	0.142	0.217
(min, max)	(-0.345, 0.496)	(-0.331, 0.770)
Interest Burden on Debt		
mean	0.042	0.022
(median)	(0.038)	(0.018)
standard deviation	0.023	0.015
(min, max)	(0.004, 0.106)	(0.000, 0.061)

Source: See Appendix A.

Table 6: Return on Assets, Seemingly Unrelated Regression

Independent Variable	Coefficient	t-value
EB (1974)	4.740×10^{-2}	1.879 *
EB (1985)	7.109×10^{-2}	1.137
VB (1974)	-1.593×10^{-2}	-0.594
VB (1985)	8.311×10^{-2}	1.732 *
Herf (1974)	-6.379×10^{-4}	-0.024
Herf (1985)	8.024×10^{-2}	2.387 **
VR	1.398×10^{-3}	0.074
TA (1974)	1.040×10^{-12}	0.549
TA (1985)	1.443×10^{-12}	1.088
FO	-2.762×10^{-2}	-1.681 *
SO	-3.786×10^{-2}	-1.771 *
ISIC C	-1.408×10^{-2}	-0.649
ISIC D	1.481×10^{-2}	0.726
ISIC E	4.666×10^{-2}	2.357 **
ISIC F	-4.026×10^{-2}	-1.922 *
ISIC G	3.575×10^{-3}	0.160
Dummy 1985	-5.364×10^{-2}	-1.986 **
Constant	7.850×10^{-2}	3.333 ***
R^2	0.181	
Number of Observations	145	

*/**/***: significant at 10/5/1 percent level (two-tailed tests,
standard errors are White (1980) corrected)

Table 7: Return on Equity, Seemingly Unrelated Regression

Independent Variable	Coefficient	t-value
EB (1974)	1.622×10^{-1}	1.899 *
EB (1985)	2.460×10^{-1}	1.155
VB (1974)	-4.299×10^{-2}	-0.535
VB (1985)	1.984×10^{-1}	1.185
Herf (1974)	6.133×10^{-3}	0.080
Herf (1985)	3.302×10^{-1}	2.772 ***
VR	4.480×10^{-2}	0.783
TA (1974)	4.114×10^{-12}	0.774
TA (1985)	8.834×10^{-12}	1.808 *
FO	-3.651×10^{-2}	-0.681
SO	-1.396×10^{-1}	-2.168 **
ISIC C	-1.439×10^{-1}	-2.069 **
ISIC D	-7.250×10^{-2}	-1.168
ISIC E	5.646×10^{-2}	0.956
ISIC F	-8.031×10^{-2}	-1.220
ISIC G	-9.282×10^{-2}	-1.449
Dummy 1985	-1.759×10^{-1}	-2.014 **
Constant	2.316×10^{-1}	3.327 ***
R^2	0.174	
Number of Observations	145	

*/**/***:   significant at 10/5/1 percent level (two-tailed tests, standard errors are White (1980) corrected)

Table 8: Interest Burden on Debt, Seemingly Unrelated Regression

Independent Variable	Coefficient	t-value
EB (1974)	-5.447×10^{-1}	-1.591
EB (1985)	-8.646×10^{-1}	-0.801
VB (1974)	1.244×10^{-1}	0.299
VB (1985)	1.108	1.485
Herf (1974)	-2.188×10^{-1}	-0.614
Herf (1985)	-6.193×10^{-1}	-1.257
VR	-2.500×10^{-1}	-1.271
TA (1974) ·	-2.438×10^{-11}	-0.954
TA (1985)	-4.107×10^{-11}	-2.164 **
FO	-1.817×10^{-2}	-0.084
SO	2.995×10^{-1}	1.471
ISIC C	2.918×10^{-1}	1.152
ISIC D	-4.934×10^{-2}	-0.199
ISIC E	-6.979×10^{-2}	-0.243
ISIC F	-8.714×10^{-1}	-2.915 ***
ISIC G	2.507×10^{-1}	0.974
Dummy 1985	-5.764×10^{-1}	-1.570
Constant	-3.150	-10.101 ***
R^2	0.351	
Number of Observations	145	

/*: significant at 5/1 percent level (two-tailed tests,
standard errors are White (1980) corrected)

Table 9: Supervisory Board Representation of Banks, Tobit Estimation

Independent Variable	Coefficient	t-value
EB	3.845×10^{-1}	4.638 ***
VB	1.357×10^{-1}	2.650 ***
HerfNB	-4.561×10^{-3}	-0.101
VR	5.583×10^{-3}	0.231
TA (1974)	3.428×10^{-12}	0.868
TA (1985)	-1.523×10^{-12}	-1.339
FO	-1.123×10^{-2}	-0.335
SO	3.281×10^{-2}	1.269
MM	-1.771×10^{-2}	-0.875
MD	9.880×10^{-2}	1.744 *
Constant	6.894×10^{-2}	2.233 **
χ^2	55.432 ***	
Number of Positive Observations	120	
Number of Observations	145	

*/**/***: significant at 10/5/1 percent level (t-values: two-tailed tests, standard errors are Eicker (1967) - White (1980) corrected)

Appendix
Table A1.1
Companies Excluded from 1974 Sample

Rank	Company Name	Reason Company Excluded
19	Metallgesellschaft AG	Annual report is one of a bank; company is legally a bank
28	Degussa	Annual report is one of a bank; company is legally a bank
32	Henkel KGaA	Changed legal form: before Dec. 14, 1974 company was a GmbH, then KGaA (Kommanditgesellschaft auf Aktien)[1]
36	Martin Brinkmann AG	Missing data: incomplete business years.
44	co op Zentrale AG	Established in 1974; incomplete data.
45	REWE-Zentral AG	Top of a multi-stage organization; cooperative character
52	Neckermann Versand KGaA	Legal form: KGaA (Kommanditgesellschaft auf Aktien)
54	Stahlwerke Südwestfalen AG	In the process of restructuring.
61	Kraftwerk Union (KWU) AG	Annual Report not sufficiently detailed.
63	Agfa-Gevaert AG	Annual Report not sufficiently detailed.
67	EDEKA Zentrale AG	Top of a multi-stage organization; cooperative character
75	Felten & Guilleaume Carlswerk AG	In the process of restructuring

[1] Kommanditgesellschaft auf Aktien: a special kind of stock corporation which differs with respect to liability. GmbH: a company with limited liability (like stock corporations but without traded stock and less restrictive rules for disclosure).

Source: Verlag Hoppenstedt, Handbuch der deutschen Aktiengesellschaften, Issues 1974/75 and 1975/76, Darmstadt.

Appendix
Table A1.2
Distribution of Firms (1974 Sample) by International Standard Industrial Classification

Number of Firms	ISIC Category	Industrial Classification
7	C	mining and quarrying
46	D	manufacturing
12	E	electricity, gas and water supply
15	F	construction
6	H	wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods
2	I	transport, storage and communications
total: 88		

Sources: United Nations, International Standard Industrial Classification of All Economic Activities. Third Revision. Statistical Papers, Series M, No. 4, Rev. 3, New York 1990.

Verlag Hoppenstedt, Handbuch der deutschen Aktiengesellschaften, Issues 1974/75 and 1975/76, Darmstadt.

Rank in 1974 Sample	Rank in 1985 Sample	Company Name
5	1	Daimler-Benz AG
4	2	Volkswagenwerk AG
6	3	Siemens AG
3	4	BASF AG
9	5	Bayer AG
2	6	VEBA AG
7	7	Hoechst AG
1	8	Thysssen AG (formerly August Thyssen-Hütte AG)
14	9	Rheinisch-Westfälisches Elektrizitätswerk (RWE) AG
8	11	Ruhrkohle AG
33	12a	Klöckner-Werke AG
31	12b	Klöckner-Humboldt-Deutz (KHD) AG
12	13	Deutsche Shell AG
43	14	Bayerische Motorenwerke (BMW) AG
23	16	Ford-Werke AG
10	18	ESSO AG
19	19	Metallgesellschaft AG [a]
25	20	Adam Opel AG
16	21	MAN AG (formerly Gutehoffnungshütte Aktienverein [GHH])
53	22	Ruhrgas AG
20	23	Deutsche BP AG
35	25	Vereinigte Industrie-Unternehmungen AG (VIAG)
17	26	Salzgitter AG
28	27	Degussa AG [a]
22	33	Deutsche Texaco AG
18	35	Hoesch AG

Appendix
Table A2.1
Firms included in 1985 Sample (continued)

Rank in 1974 Sample	Rank in 1985 Sample	Company Name
48	37	Philipp Holzmann AG
27	36	Mobil Oil AG
34	38	Brown Boveri & Cie AG
29	40	Saarbergwerke AG
50	41	Vereinigte Elektrizitätswerke Westfalen (VEW) AG
86	44	Bayernwerk AG
37	45	Standard Elektrik Lorenz (SEL) AG
51	46	Hochtief AG
39	47	Deutsche Babcock AG (formerly Deutsche Babcock & Wilcox AG)
59	49	Continental Gummiwerke AG
47	51	Enka AG (formerly Enka Glanzstoff AG)
—	53	Nixdorf AG
—	54	AGIV AG für Industrie und Verkehrswesen
72	55	Zahnradfabrik Friedrichshafen (ZF) AG
70	58	Linde AG
62	60	Rütgerswerke AG
—	61	Zeiss Ikon AG
—	63	Porsche AG
91	67	Beiersdorf AG
55	72	Grundig AG
77	73	Energie-Versorgung Schwaben AG
—	77	Rheinmetall Berlin AG
—	78	Contigas AG
68	80	Strabag Bau-AG
79	83	Bilfinger + Berger Bauaktiengesellschaft

Appendix
Table A2.1
Firms included in 1985 Sample (continued)

Rank in 1974 Sample	Rank in 1985 Sample	Company Name
56	84	Aktiengesellschaft der Dillinger Hüttenwerke
82	85	Badenwerk AG
85	89	Berliner Kraft- und Licht (Bewag)-AG
80	91	Hamburgische Electricitäts-Werke (HEW) AG
81	92	Fichtel & Sachs AG
69	99	Dyckerhoff & Widmann AG

ª Not included in 1974 Sample. See Table A1.1.

Source: Frankfurter Allgemeine Zeitung, October 3, 1987.

Appendix
Table A2.2
Companies Excluded from 1985 Sample

Rank	Company Name	Reason Company Excluded
15	Mannesmann AG	Annual report not sufficiently detailed
28	Feldmühle Nobel AG	before Dec. 12, 1985, legal form of KGaA (Kommanditgesellschaft auf Aktien)
31	Henkel KGaA	Legal form: KGaA (Kommanditgesellschaft auf Aktien)
32	Preussag AG	Annual report not sufficiently detailed
52	Schering AG	Annual report not sufficiently detailed
71	FAG Kugelfischer KGaA	Legal form: KGaA (Kommanditgesellschaft auf Aktien)
81	Papierwerke Waldhof-Aschaffenburg (PWA) AG	Annual report not sufficiently detailed
82	Deutsche AG für Unterhaltungselektronik (Dagfu)	No annual report available from Hoppenstedt
93	Michelin Reifenwerke KGaA	Legal form: KGaA (Kommanditgesellschaft auf Aktien)

Source: Verlag Hoppenstedt, Handbuch der deutschen Aktiengesellschaften, Issues 1987/88 and 1988/89, Darmstadt.

Appendix
Table A2.3
Distribution of Firms (1985 Sample) by International Standard Industrial Classification

Number of Firms	ISIC Category	Industrial Classification
3	C	mining and quarrying
25	D	manufacturing
12	E	electricity, gas and water supply
15	F	construction
2	G	wholesale and retail trade; repair of motor vehicles, motorcycles and personal household goods
total: 57		

Sources: United Nations, International Standard Industrial Classification of All Economic Activities. Third Revision. Statistical Papers, Series M, No. 4, Rev. 3, New York 1990.

Verlag Hoppenstedt, Handbuch der deutschen Aktiengesellschaften, Issues 1987/88 and 1988/89, Darmstadt.

Figure 1: M-Plot, Return on Assets, 1974
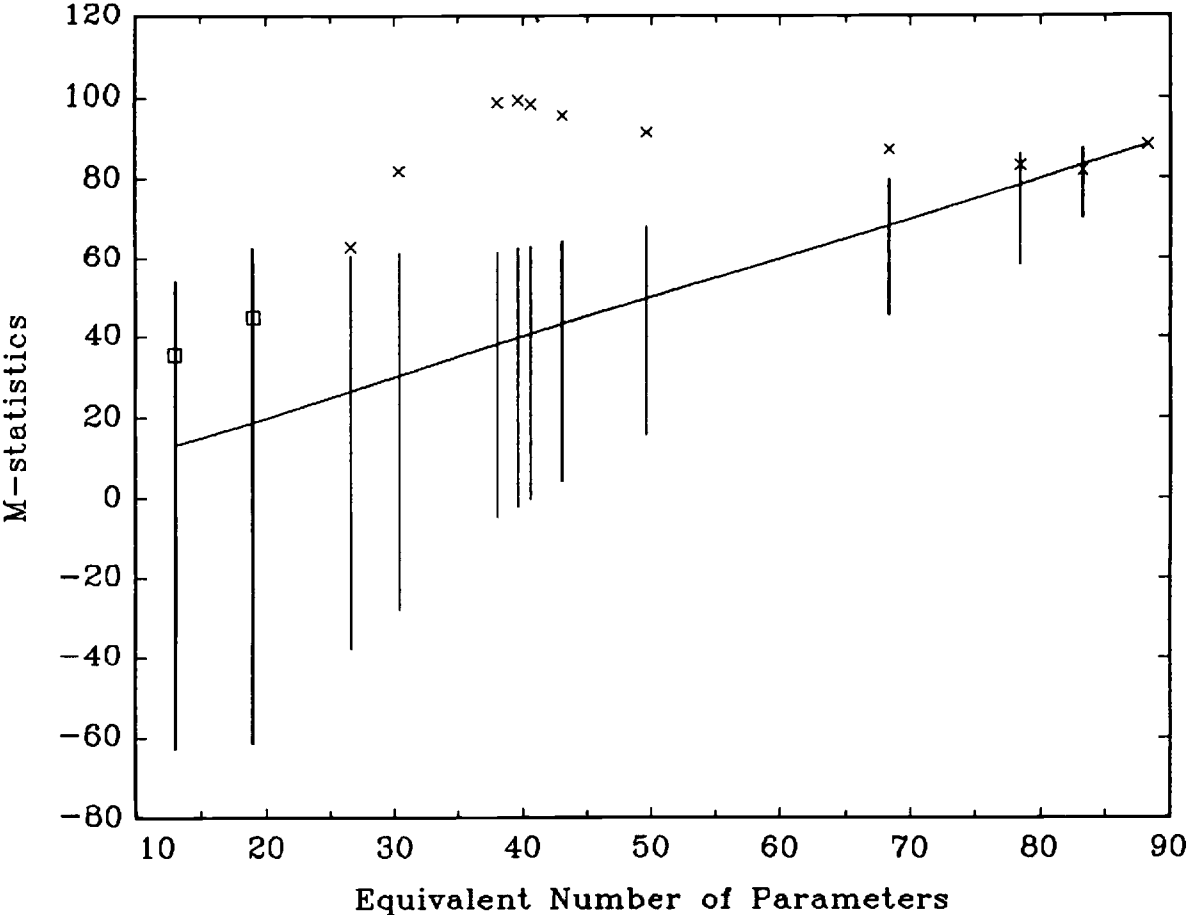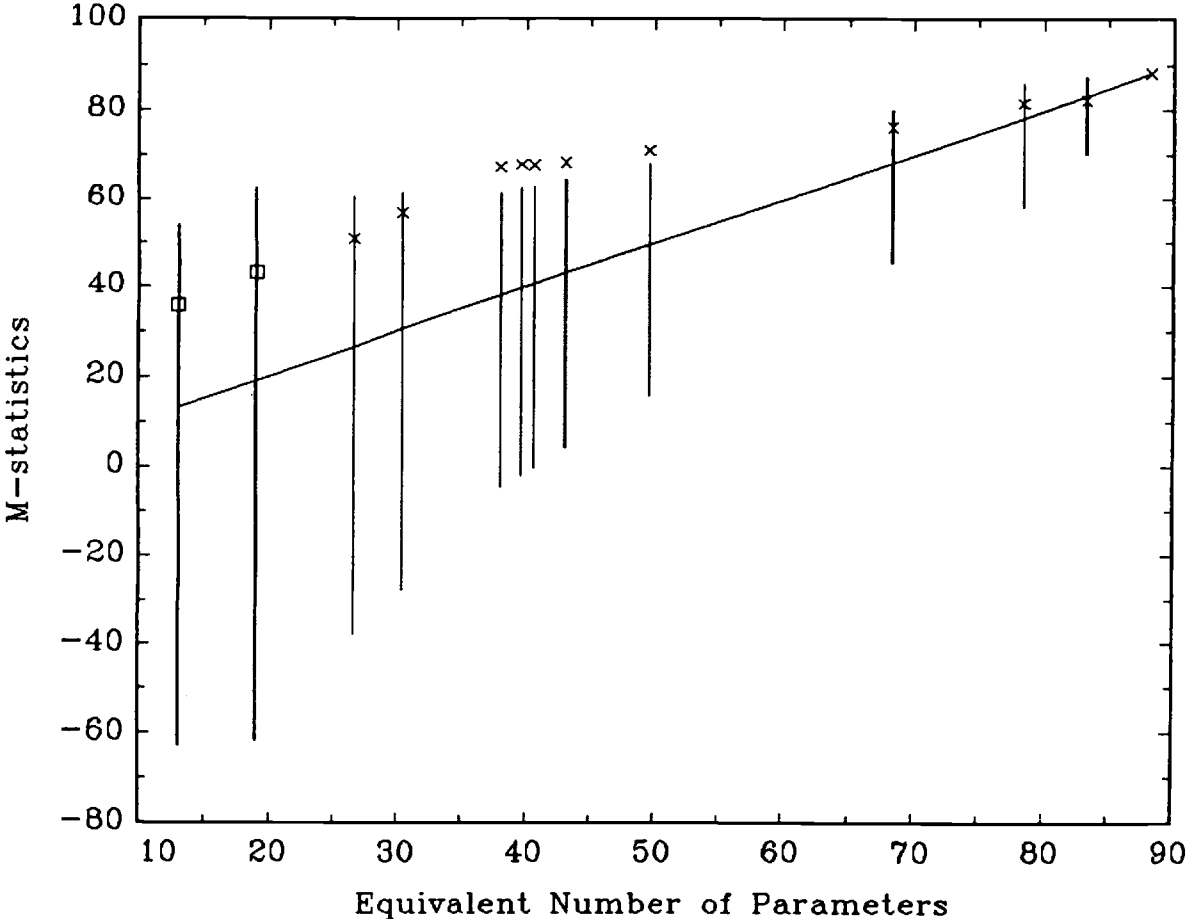
Figure 2: M-Plot, Return on Equity, 1974

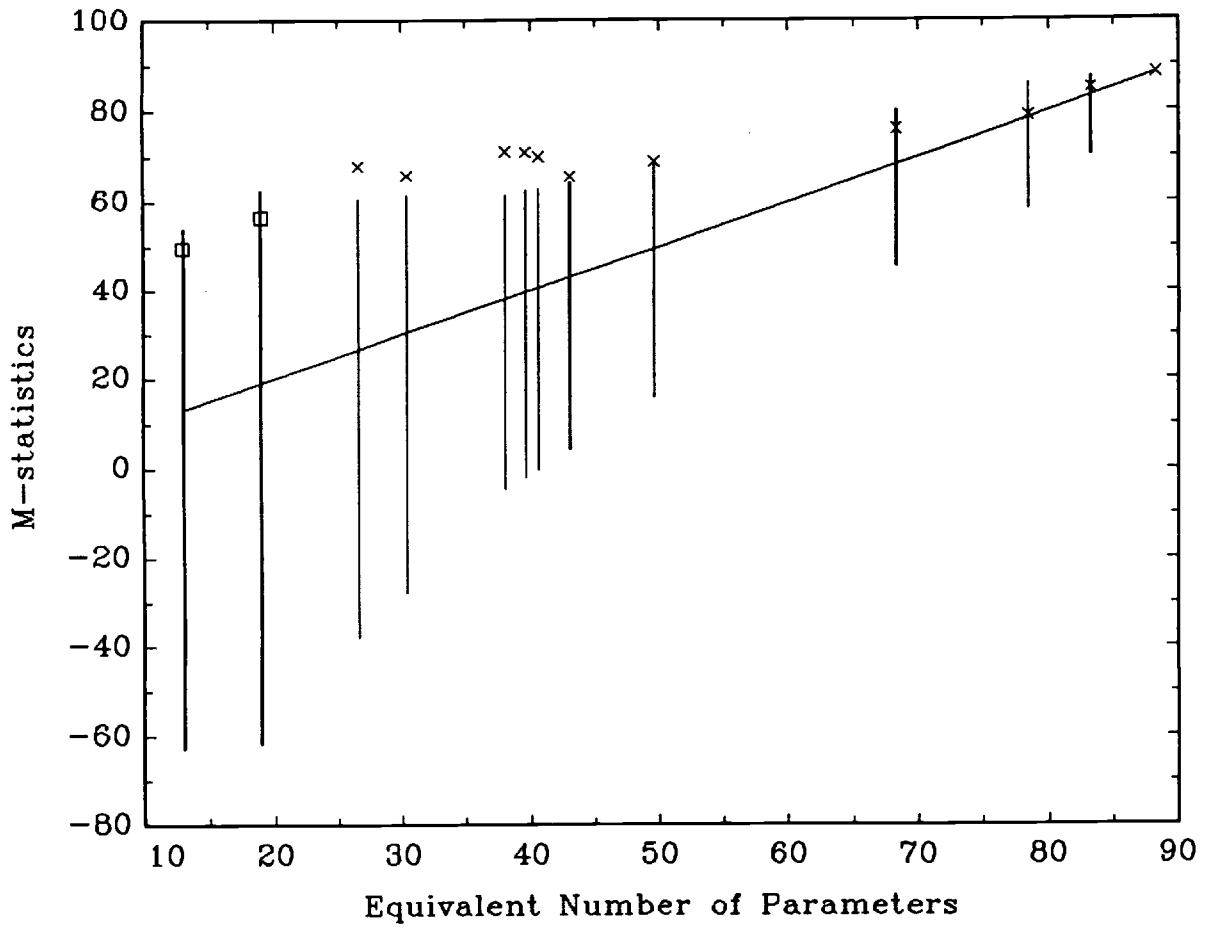Figure 3: M-Plot, Interest Burden on Debt, 1974
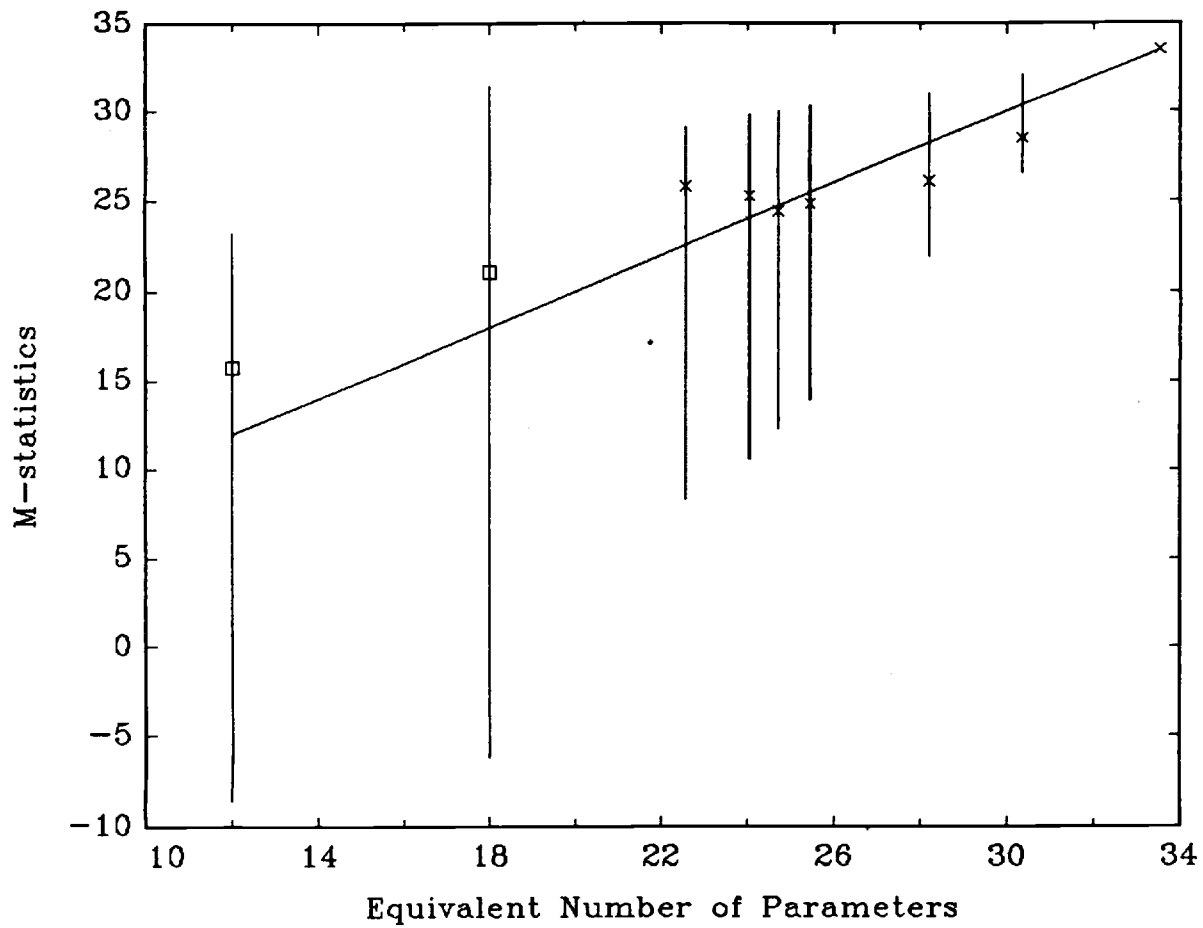
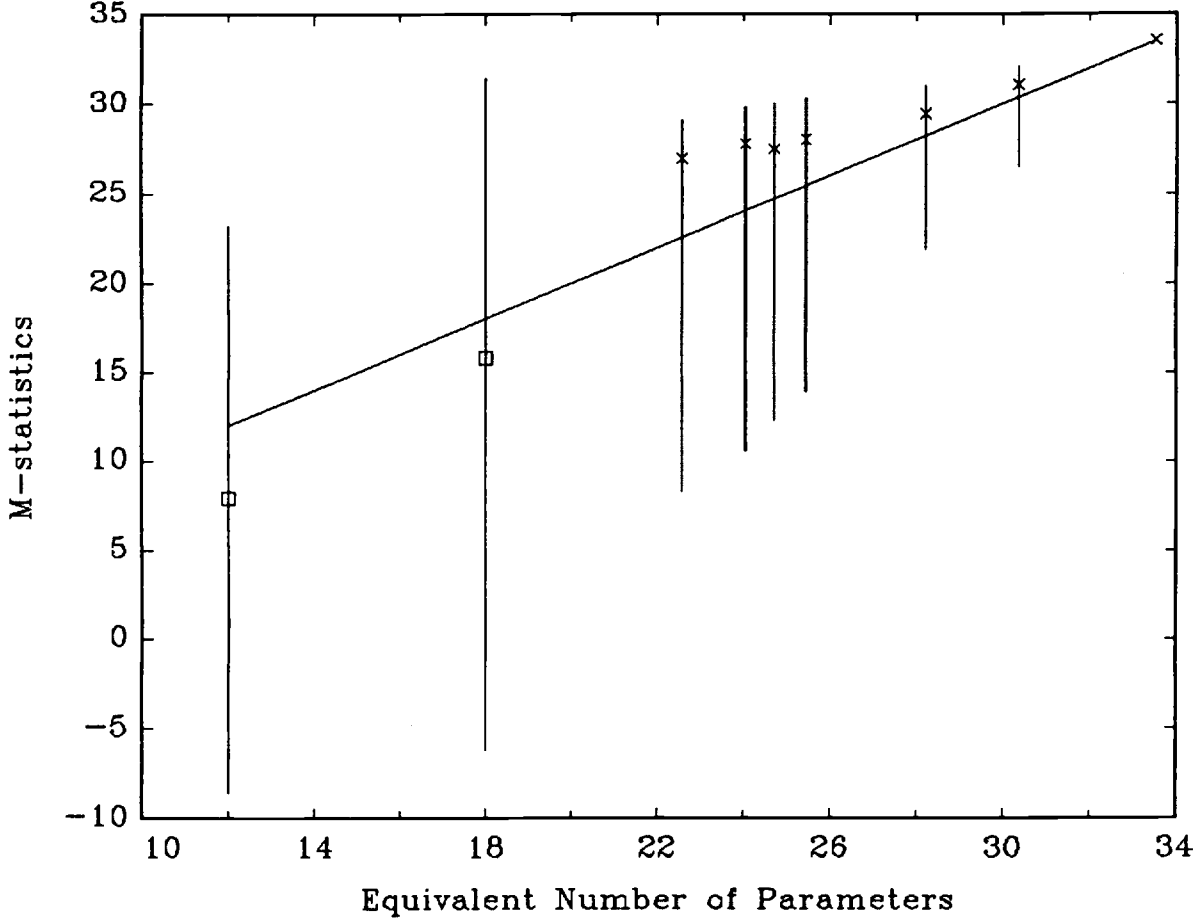Figure 4: M-Plot, Return on Assets, 1985

Figure 5: M-Plot, Return on Equity, 1985

Figure 6: M-Plot, Interest Burden on Debt, 1985