Corporate Governance in Germany: The Influence of Banks and Large Equity-Holders

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Abstract

Using data on 158 large German firms, the paper analyses the two main distinctive features of the German corporate governance system - ownership concentration and the role of banks. Ownership concentration is shown to have a positive effect on firm profitability (except when the owners are public-sector bodies). However, banks do not appear to play a role in corporate governance which is distinct from their position as one of several different types of large equity-holder. The results call into question the standard view that banks are an important component of the German system of corporate governance.

1. Introduction

The German system of corporate governance receives a great deal of attention because it is seen as being at one end of the spectrum of existing corporate governance arrangements, with the British and American systems lying at the other end (Berglöf (1997, p.115). The view that the German system is superior to the Anglo-American one is widespread: recent proponents of this view, all of whom assign an important role in the German system to banks, include Crafts (1992), Porter (1992), Benston (1994), Charkham (1994), and Hutton (1995). The aim of this paper is not to address the general question of the merits of the German corporate governance system, but rather to provide empirical evidence concerning the importance of two of its major features - the role of banks, and the highly-concentrated ownership of large firms. The conclusions of the paper do, however, have implications for the broader issues involved in evaluating alternative systems of corporate governance.

Corporate governance is defined by Shleifer and Vishny (1997) as dealing with 'the ways in which suppliers of finance to corporations assure themselves of getting a return on their investment'. From this perspective, two main features distinguish the German system of corporate governance from systems of the Anglo-American type. The first is that it has several institutional features which mean that banks are potentially capable of playing a major role in corporate governance. Banks hold equity stakes in large firms, and they also control equity voting rights because they exercise proxy votes on behalf of shareholders who have deposited their shares with the banks. In Germany a public limited company, an Aktiengesellschaft (AG), has to have a supervisory board, the main function of which is to monitor the board of senior managers who are responsible for the running of the company: banks are extensively represented on these supervisory boards. The provision of external finance to firms is dominated by banks, both as lenders and as arrangers and underwriters of new security issues. These distinctive German institutional arrangements are claimed to have two major benefits. First, it is claimed that the banks' representation on supervisory boards reduces the information asymmetries inherent in the provision of external finance to firms, so that German firms have access to external finance on better terms than do firms operating in other economies (Cable and Turner (1983, pp. 19-22)). Second, it is claimed that the German system whereby individual shareholders delegate the exercise of their voting rights to a bank overcomes the problems of inadequate monitoring of the management of large firms with widely-dispersed ownership, since the banks then have sufficient voting power together with their monitoring ability to ensure that firm managers perform well (Charkham (1994, p. 38)).

The second main distinctive feature of the German corporate governance system is the highly-concentrated ownership of large firms. Franks and Mayer (1992), for example, found that

nearly 90% of the largest 200 companies in Germany at the end of the 1980s had at least one equity-holder owning 25% or more of the share capital, while in the UK two-thirds of the largest 200 companies had no single equity-holder with a holding of more than 10%. The free-riding problem which results in inadequate monitoring of the management of firms with dispersed ownership may be diminished substantially when ownership is concentrated (Shleifer and Vishny (1986)). Until relatively recently, the highly-concentrated ownership of large firms received much less emphasis as a distinctive feature of the German system of corporate governance than did the role of banks, but it is beginning to be seen as equally important: for example, Shleifer and Vishny (1997), in their survey of corporate governance, describe Germany as having "a system of governance by both permanent large shareholders…and by banks".

It is important to establish the relative importance of these two features of the German corporate governance system, since the greater emphasis that has recently been put on the concentrated ownership of large firms raises doubts about the significance of banks. If most large German firms have concentrated ownership, the importance of banks' ability to exercise proxy votes to ensure that managers of firms with widely-dispersed ownership are monitored diminishes, because there are only a few such firms. Similarly, the significance of large bank equity holdings in firms decreases once it is appreciated that there are many other types of large equity-holders in Germany.

There are also other issues which must be addressed in order to gain a full understanding of the role of large equity-holders and banks in the German system of corporate governance. Many of the large equity-holders in large German firms are not individuals whose own wealth will clearly be increased by monitoring the management of these firms. Rather, they are organisations run by agents - other firms, banks, public sector bodies - and these agents do not necessarily have any direct interest in using the equity holding to improve the profitability of the firm in which the equity is held, since the benefits of monitoring do not necessarily accrue to them. The importance of taking account of this aspect of the ownership structures of large German firms has been emphasised by Franks and Mayer (1997), and it is necessary to establish whether the argument that large owners have positive effects on firm profitability applies to those owners which are organisations run by managements. A related issue is that there is both theoretical and empirical support for the view that as ownership concentration increases, profitability initially improves but then declines (Morck, Shleifer and Vishny (1988), McConnell and Servaes(1990)). There are many possible ways in which a dominant owner can benefit at the expense of other equity-holders in a firm by lowering the firm's reported profits. One possibility is for an owner holding, say, 51% of the equity in firm A and 100% of the equity in firm B, which supplies inputs to firm A, to lower profits in firm A by buying inputs from firm B at above-market prices. Another possibility is for a dominant owner to arrange to be paid an exorbitant director's fee. Hence it is important to

investigate the possibility that the relationship between firm profitability and the extent of concentration of ownership in Germany is non-linear.

A final issue which needs to be considered is the role of banks in those firms in which banks do not own equity. German banks' control of proxy votes and representation on supervisory boards are argued to allow them to play an especially important corporate governance role, but in those cases where banks do not own equity, it is far from clear that bank control of proxy votes and supervisory board representation will be used to improve firm profitability. The benefit of using proxy votes, for example, to improve firm profitability in such cases accrues not to the banks but to those equity-holders who have delegated the exercise of their voting rights to the banks. It is therefore difficult to see why the banks should incur the costs which may be involved in using proxy votes to improve profitability. A similar argument applies to bank supervisory board representation.[1]

This paper provides empirical evidence on all these issues, thereby enabling a clear assessment of the relative importance of banks and ownership concentration in the German system of corporate governance. The plan of the paper is as follows. Section 2 briefly surveys the existing empirical evidence on corporate governance in Germany. Section 3 describes the dataset analysed in this paper, which is considerably richer than any used in previous empirical studies. Section 4 describes the main features of corporate governance in Germany revealed by this dataset. Section 5 discusses the specification of a regression model to analyse the effects of ownership concentration and banks on firm profitability, and presents the results of this analysis. The conclusions of the paper are set out in Section 6.

2. The existing evidence on banks and ownership concentration in German corporate governance

A number of empirical studies of aspects of the role of banks and large equity-holders in the German corporate governance system have been conducted. These studies can be classified into three broad categories.

The first comprises those by Perlitz and Seeger (1994) and Chirinko and Elston (1997), both of which analysed samples of listed AGs by classifying firms as being either influenced or not influenced by banks according to various criteria, and then comparing the profitability of these

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[1] It might be argued that the loans made by banks to firms give them incentives to use proxy votes and supervisory board representation to improve performance. But large German firms in general make very little use of bank loan finance (Edwards and Fischer (1994), Ch. 6), and any such incentives would apply only to ensuring that performance was adequate for the loans to be repaid: performance improvements beyond this level would not benefit banks.

two groups of firms. Perlitz and Seeger found that the profitability of the bank-influenced firms was lower than that of the other group of firms, while Chirinko and Elston found no difference in profitability. The drawback of these two studies is that the classification of firms into two broad groups, one bank-influenced and the other not, may fail to identify the possible effects of banks on firm profitability. Perlitz and Seeger, for example, classified a firm as bank-influenced if one of the following three criteria were fulfilled: banks controlled the votes of more than 50% of the equity; the chairman of the supervisory board was a banker; or bank loans amounted to more than 25% of the balance-sheet total. A similar broad-brush classification of firms as bank-influenced or not is used by Chirinko and Elston. Such a classification means that the importance of different possible channels of bank influence – equity ownership, proxy votes, supervisory board membership, and loans – cannot be distinguished. It also means, for example, that a firm would be treated as not bank-influenced even if banks controlled the votes of 49% of the equity, a majority of the shareholder representatives on the supervisory board (but not the chairman) were bankers, and bank loans amounted to 24% of the balance-sheet total. Defining such firms as not bank-influenced is especially problematic if firm profitability is not monotonically increasing in bank influence. Bank control of, for example, 20% of the equity of a firm with widely-dispersed share ownership may result in a significant improvement in profitability, but further increases in bank control of equity votes may not lead to further profitability improvements. Such an effect on profitability would not be identified by the categorisation used by these two studies. Thus serious doubts exist as to whether such broad categorisations are capable of identifying the various effects of banks on firm profitability in Germany. By their nature, these studies are also unable to consider the importance of ownership concentration in German corporate governance.

The second type of empirical study comprises those by Kaplan (1994) and Franks and Mayer (1997). Both investigated whether the relationship between the turnover of both management and supervisory boards of AGs and firm profitability was influenced by ownership concentration and bank control of equity voting rights. The hypothesis is that there is some relationship between board turnover and firm profitability - in particular turnover should be higher when profitability is low - and that the strength of this relationship (the increase in turnover corresponding to a given decline in profitability) depends on the extent of monitoring of the boards. Hence if banks and large equity-holders are the major monitors of the managers of large German firms, one might expect to observe a stronger relationship between board turnover and profitability in firms with a higher concentration of ownership and a larger degree of bank control of voting rights. The conclusion of both studies was that the relationship between board turnover and firm profitability did not depend on either ownership concentration or bank control of equity voting rights. The difficulty here, as Kaplan himself notes, is that this finding can be interpreted in different ways. If most AGs have high ownership concentration, and banks control substantial voting rights in those which do not have a large non-bank equity-holder, this finding may indicate

that the managers of all firms are subject to the same high degree of monitoring, which is reflected in a turnover-profitability relationship that does not depend on whether a particular firm has concentrated ownership or bank control of voting rights. An alternative interpretation, however, is that this finding indicates that neither large shareholders nor banks monitor management. The problem with these studies is that they test a hypothesis which is not directly related to the role of banks and ownership concentration in the German corporate governance system, and hence they cannot provide any definite evidence on the influence of these features.

The third type of empirical study comprises those by Cable (1985) and Gorton and Schmid (1996). Both analysed the relationship between the accounting profitability of AGs, ownership concentration, and various measures of bank influence. Cable's study of 48 listed AGs considered the effects on profitability of ownership concentration, overall bank control of equity voting rights (combining banks' equity holdings and their proxy votes), bank supervisory board representation, and bank lending, while holding several firm and industry effects constant. Cable also distinguished the effects of the three largest German banks from those of all other banks. The results showed a positive effect of both ownership concentration and bank lending on firm profitability. There was also some limited evidence of bank control of voting rights and bank supervisory board representation having positive effects on profitability, but, as Edwards and Fischer (1994) pointed out, Cable's interpretation of these results is questionable:

> Cable's study provides only very limited support in favour of the view that banks use their control of equity voting rights to perform a corporate control function…Cable's study provides considerably more support for the view that what is distinctive about German AGs is their typically concentrated share ownership.

The conclusions to be drawn from Cable's work about the relative importance of ownership concentration and bank influence in German corporate governance are thus ambiguous. Unfortunately, Gorton and Schmid's study does not resolve this ambiguity. Gorton and Schmid had data for a sample of 88 listed AGs in 1974 and a sample of 57 listed AGs in 1985. In contrast to Cable, Gorton and Schmid did not consider any effect of bank supervisory board representation or bank lending on profitability, nor did they distinguish between different banks, but they did distinguish the effects of banks' own equity holdings from those of bank proxy votes. Gorton and Schmid's results showed no effect of bank proxy votes on profitability in either year. There was weak evidence (significant at the 0.10 level) of a positive effect of bank equity holdings, distinct from that of other large shareholders, in 1974, but no evidence of this effect in 1985. There was no evidence of a positive effect of ownership concentration in general on profitability for the 1974 sample, but strong evidence of such an effect for the 1985 sample.

As this discussion reveals, existing empirical studies of corporate governance in Germany do not enable anything definite to be said about the relative importance of banks and ownership concentration. The studies by Cable and Gorton and Schmid are in principle the most informative, since they analyse the separate effects of banks and ownership concentration on firm profitability. Unfortunately these two studies have ambiguous results, and they do not address all the issues which need to be considered (neither, for example, attempts to distinguish the effects of different types of large equity-holder). The empirical approach taken in this paper is similar to that of Cable and Gorton and Schmid, but by using a richer dataset it is able to analyse a wider range of issues, and hence to come to a clearer conclusion about the role of banks and large equity-holders in German corporate governance.

3. The Data

The analysis in this paper is based on a sample of 158 of the 200 largest non-financial German enterprises in 1992, measured in terms of turnover. Data were collected on several different characteristics of these firms: their performance (based on accounting profitability data and, where possible, stock market data); their ownership structure; the nature of their connections with banks, in the form of bank equity holdings, bank control of proxy votes, and bank supervisory board representation; and other features such as the primary industry in which they operated and their organisational structure.

The sample contained only 158 of the largest 200 non-financial firms because the criteria used in collecting the data eliminated 42 firms. For some firms, the data required were not available in full. For others, the data were not available in a comparable form: this was particularly the case for firms of the GmbH & Co. KG form, which, in contrast to other types of limited company, did not have to produce accounts according to European Community standards in the relevant time period. Some of the data collected (e.g. accounting profitability and stock market returns) were for the five-year period 1988-1992, while the remainder (e.g. ownership structure, bank control of equity voting rights, bank supervisory board representation, industry classification) were for a single year, which was in most cases 1990. If any of the variables in this latter category (measured for a single year) displayed significant changes over the five-year period 1988-1992, the firm in question was excluded from the sample.

By far the most difficult data to obtain were those concerning bank control of equity voting rights. Data on the votes exercised by equity-holders in Germany do not exist on any computer database, and have to be obtained from commercial registers in many different cities, where lists giving details of the votes cast at the annual general meetings of firms are deposited.

On average these lists are 200-250 pages long, although sometimes they exceed 1,000 pages, and they contain thousands of individual entries. Analysing these lists to determine whether the votes cast resulted from own equity holdings or bank exercise of proxy votes, and processing the results, was very time-consuming. The benefit of having done so is that it produced detailed data for 158 firms on bank exercise of proxy votes, which, as will be shown in Section 4, are a major component of banks' overall control of equity voting rights in Germany. The effort involved in collecting data on bank proxy votes explains why other studies have used much smaller samples[2].

One feature of the data collected on bank control of proxy votes which deserves special mention is the fact that in some firms the votes of large equity-holders were exercised by banks as part of their proxies. In such cases it is almost certain that the banks were instructed as to how these votes should be cast, and therefore these votes should not be treated as proxies under bank control.[3] The information contained in the lists of votes cast made it possible to adjust the data on bank proxy votes appropriately. This adjustment was relatively straightforward, since in almost all cases these votes were cast by a single bank which exercised a disproportionately large fraction of the overall votes.

A possible way in which banks can play a corporate governance role is if they have provided a substantial amount of loan finance to a firm. Unfortunately the only data available on the use of bank loan finance by a given German firm is an aggregate figure for bank loans contained in that firm's accounts. A given aggregate figure for bank loans will correspond to different degrees of bank influence depending on whether it has been raised from one or many banks, but it is not possible to establish the number of banks from which a firm has borrowed, let alone their individual identities, from the available information. Since the quality of the bank lending data was poor, and since there is evidence from other sources that large German firms both make very little use of bank loan finance and typically borrow the relatively small amounts they do from a large number of banks (see Edwards and Fischer (1994), Ch.6), the econometric

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[2] Given the difficulty of collecting data, for some firms in which more than 75% of the equity was owned by large non-bank holders, bank control of proxy votes was estimated instead of being obtained exactly from the lists of votes cast. In these cases, each of the three big banks, and all other banks together, were assumed to control proxies in proportions corresponding to the average proportions they controlled through proxies for the other firms in the sample, adjusted to take account of the size of the equity owned by the large non-bank equity-holders. Bank control of proxy votes was estimated in this way for 18 firms: since the total proportion of votes controlled by banks can only be small in these cases, the scope for error resulting from this estimation of bank proxy votes is also small.

[3] The operation of the proxy vote system in Germany requires a bank to which a proxy voting right has been given to inform the equity owner how it intends to vote on the various issues on the agenda at an equity holders' meeting, and to ask for directions as to how the proxy votes should be exercised. If no directions are given, the bank can exercise the proxy votes according to its stated intention.

analysis of German banks' corporate governance role in Section 5 does not attempt to investigate the possible influence of bank loans.[4]

In all other respects, however, the dataset is an extremely good one for the purposes of analysing the influence of banks and ownership concentration on corporate governance. The sample covers both listed and unlisted firms, an important feature given that (as the next section shows) many large firms in Germany are not listed, so that studies based solely on samples of listed firms are potentially misleading. For each firm there are data on the proportion of the voting equity controlled by non-banks (in principle by the five largest non-bank owners of each firm, although for some firms it was not possible to identify so many) as well as by banks. Banks are categorised into the three big banks (Deutsche Bank, Dresdner Bank, and Commerzbank) and all other banks. As well as for bank ownership, data exist for each firm on the proxy votes exercised by these different banks, and their supervisory board representation. We now turn to describing the extent of ownership concentration and bank influence revealed by this dataset.

4. Ownership concentration and bank influence.

Large German firms take several different legal forms. There are two types of firm which can issue shares that are legal evidence of ownership: the Aktiengesellschaft (stock corporation, abbreviated AG) and the Kommanditgesellschaft auf Aktien (partnership partly limited by shares, abbreviated KGaA). The former corresponds to a public limited company, while the latter has elements of both a public limited company and a partnership. Both an AG and a KGaA are required to have a supervisory board, consisting of both shareholder and worker representatives. The supervisory board has the legal right to appoint and dismiss the management board, which is responsible for the operation of the AG or KGaA. AGs and KGaAs are the only two types of firm in Germany which can be listed on a stock market, but many AGs and KGaAs are not listed. The German equivalent of a private company is the Gesellschaft mit beschränkter Haftung (limited liability company, abbreviated GmbH). GmbHs cannot issue shares that are legal evidence of ownership. A GmbH is required to have a supervisory board if the number of its employees exceeds 500, but the supervisory board of a GmbH does not have the legal right to appoint and dismiss the managers, in contrast to that of an AG or KGaA: this right belongs to the owners of a GmbH. However, the owners of most large GmbHs delegate this right to the supervisory board. Most of the firms in the sample took one of these three forms: there were 133 AGs, 3 KGaAs and 17 GmbHs. The remaining five of the 158 firms comprised three partnerships of various forms,

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[4]Nibler (1998) shows that firm profitability is not significantly related to aggregate loans from banks measured as a proportion of the firm's total liabilities.

one cooperative, and one foundation. 103 of the firms in the sample were listed (all being AGs or KGaAs).

It was possible to identify the proportion of the voting equity owned by the largest equity-holder for 154 of the 158 firms in the sample: the smallest such holding which could be identified was 3.09%. In the four cases in which a largest equity-holder could not be identified, it was assumed that the largest holding was zero. Any errors introduced by this assumption will be small. The holding of the second-largest equity-holder could also be identified for 79 of the firms: the smallest such holding which could be identified was 2.23%. Of the remaining 79 cases, 31 were firms in which the largest equity-holder owned 100%, so that there was no second-largest equity-holder, and 48 were firms for which such an equity-holder could not be identified, so that the holding was assumed to be zero.

Table 1 gives information about the largest and second-largest equity-holders for the full sample of 158 firms and for the sub-sample of listed firms. It is very clear from Table 1 that large German firms typically have large equity-holders. In the full sample, the mean value of the holding of the largest owner was 57.6%, and the median value was 51%, so that more than half of the firms (88 of 158) had a largest owner holding more than 50% of the equity. Only 30 of the firms (19.0%) did not have a largest owner holding more than 25% of the equity. The reason for this choice of threshold value is that in Germany a holding of more than 25% of the equity enables the holder to block major decisions such as changes in the articles of association and increases in share capital. Furthermore, only six firms did not have a largest owner holding more than 5% of the equity (these six include the four firms for which a largest equity-holder could not be identified). We define these six firms as being those in the sample with dispersed ownership. Any definition of dispersed ownership is inevitably somewhat arbitrary, but the key point is that there are very few large German firms with dispersed ownership, and this conclusion does not depend on the precise definition used: for example, if we were to broaden the definition to firms in which the largest owner did not hold more than 10% of the equity, the number of firms would increase only from six to nine.

Table 1 also shows that 79 firms have a second-largest equity-holder, and that these owners typically have a holding which is about 20%. Many large German firms therefore have two distinct owners each with a holding which is large in comparison with the size of holdings in, say, UK firms.

Table 1: Largest and second-largest equity-holders of firms

		Largest				Second-largest	
	No.	Mean proportion of voting equity held	Median proportion of voting equity held	No. in which holding >25%	No.	Mean proportion of voting equity held	Median proportion of voting equity held
A. All firms	158	57.6	51.0	128	158	9.9	11.2
of which:							
Individuals/families	64	65.0	60.0	58	21	22.2	18.2
Non-bank enterprises	32	35.5	30.5	19	23	22.3	23.8
Three big banks	8	23.2	26.3	5	13	13.4	11.2
Other banks	5	43.2	49.9	5	6	13.6	11.2
Public sector bodies	14	54.5	51.7	13	9	21.2	26.0
Foreign	31	85.2	98.9	28	7	20.3	25.0
Unidentified	4	0.0	0.0	0	48	0.0	0.0
B. Listed firms	103	45.2	45.0	74	103	9.4	5.5
of which:							
Individuals/families	39	54.4	51.0	34	15	19.9	18.2
Non-bank enterprises	26	30.0	26.3	13	18	18.4	19.4
Three big banks	8	23.2	26.3	5	12	13.6	10.6
Other banks	5	43.2	49.9	5	5	11.1	10.4
Public sector bodies	9	49.8	51.0	8	5	18.0	15.0
Foreign	12	75.1	93.5	9	3	9.9	10.0
Unidentified	4	0.0	0.0	0	41	0.0	0.0

Another point which emerges clearly from Table 1 is that the majority of the large equity-holders were organisations run by agents. Of the 154 largest identifiable owners in the full sample, 90 fell into this category.[5] It is not obvious that these large owners have the appropriate incentives to monitor management, for the reasons discussed in the introduction. It should be noted that German banks were relatively unimportant as largest equity-holders: only 13 of the firms in the full sample had a bank as largest owner, compared to 32 with a German non-bank enterprise as largest owner. German banks were more important as second-largest owners, although the average value of these holdings was relatively small.

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[5] This category comprises non-bank enterprises, banks, governments, and foreign owners. The firms with foreign owners were typically German subsidiaries of foreign enterprises.

A comparison of the sub-sample of listed firms with the full sample in Table 1 shows that ownership concentration is somewhat lower for the listed firms, which is as would be expected given that ownership claims in such firms can be traded on a stock market. However, ownership concentration among large listed German firms is still high in comparison to large listed firms in the UK.[6] Foreign largest equity-holders were proportionally less important for the listed firms than for the full sample, while non-bank enterprises and banks were proportionally more important for listed firms. Only two of the unlisted firms had a largest or second largest owner which was a bank: large bank equity-holdings were heavily concentrated among the listed firms. All six firms with dispersed ownership were listed.

Table 1 shows that banks were large equity-holders for only a relatively small number of large German firms. However, a complete assessment of German banks' possible role in corporate governance requires account to be taken of their control of proxy votes and their representation on supervisory boards, to which we now turn.

German banks' ability to exercise proxy votes gives them significant additional control of equity voting rights beyond those they exercise by virtue of their own equity holdings. For the full sample of firms, the mean (median) value of banks' own equity-holdings was 6.7% (0.3%), while the mean (median) value of banks' proxy votes was 8.4% (5.3%). Proxy votes controlled by banks were therefore larger than banks' own equity holdings, and banks had proxy votes in many more firms than they held equity, as is shown by the smaller difference between the mean and median values of proxy votes. Both banks' equity holdings and their control of proxy votes were more important for listed firms than for the full sample: the respective mean values for the 103 listed firms were 9.7% and 12.7%.

In order to indicate the extent to which bank control of voting rights was large enough to be significant in influencing the decisions at meetings of equity-holders, Table 2 shows, for the full sample, the number of cases in which an individual bank controlled more than 5% of the equity voting rights due to either equity holdings alone, proxy votes alone, or a combination of equity holdings and proxy votes each of which was less than 5%. The dominant position of the three big banks in this respect is apparent. These figures overstate the number of firms for which individual banks controlled more than 5% of the equity voting rights, since some firms had more than one bank with this degree of voting right control. The total of 47 cases of a bank controlling more than 5% of voting rights due to equity holdings corresponded to 39 firms; for proxy votes

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[6] See Franks and Mayer (1992).

Table 2: Cases of individual bank control of more than 5% of votes

	Three big banks	All other banks	All banks
Bank equity holdings	34	13	47
Bank proxy votes	36	4	40
Combined bank equity holdings and proxy votes	5	1	6

the 40 cases corresponded to 27 firms; while for both combined the 6 cases corresponded to 5 firms.

Proxy votes therefore gave banks, and in particular the three big banks, significant additional control of equity voting rights for a substantial minority of firms in the sample. However, some doubt is cast on the argument that bank control of proxy votes in Germany overcomes the problem of inadequate monitoring of firm management by the fact that in several cases a bank controlling more than 5% of the equity voting rights through proxies did not own any equity in the firm. Hence the bank's incentives to use the proxy votes to monitor management are unclear. In six of the 17 firms for which Deutsche Bank controlled more than 5% of voting rights via proxies it owned no equity: the corresponding figures for Dresdner Bank were nine of 17 firms, and for Commerzbank one of two firms.

Bank control of proxy votes is argued to be particularly important for ensuring monitoring of the management of firms with dispersed ownership. The mean value of proxy votes controlled by all banks for the six firms in the sample with dispersed ownership was 25.0%, almost double the corresponding mean for all listed firms. But in two of the six firms with dispersed ownership the total proxy votes controlled by all banks were 4.2% and 5.5%, and in both firms no single bank controlled more than 3.6%, so it is not clear that for these two firms any bank had sufficient proxy votes to induce effective monitoring. Furthermore, there were no bank equity holdings at all in these two firms, raising the question about incentives to monitor. Thus, although the evidence on bank control of proxy votes is consistent with the argument about monitoring management of firms with dispersed ownership for four of the six firms in this category (individual banks both controlled significant fractions of equity voting rights via proxies and owned equity in these firms), for two of the firms with dispersed ownership it is not. More generally, the extremely small number of firms in Germany with dispersed ownership raises serious doubts about the overall importance of the possible use of bank control of proxy votes to monitor such firms.

The discussion of bank control of equity voting rights so far has not considered the possibility that banks control votes indirectly as well as directly. Table 1 shows that, for the full sample, 32 firms had a largest identifiable equity-holder which was a German non-bank enterprise. If banks controlled significant proportions of equity voting rights in these 32 non-bank enterprises, the banks' overall control of voting rights would be understated by the figures discussed so far. Banks did own equity in 23 of these non-bank equity-holders, but their average holding in these firms was only 1.24%. Similarly, banks exercised proxy votes in 24 of these non-bank equity-holders (which partly overlap with those in which banks held equity), but on average they controlled only 0.80% of the total in this way. Banks thus do not control a sufficiently high proportion of the equity voting rights in those non-bank enterprises which are largest equity-holders in other firms for the discussion so far to underestimate banks' overall control of equity voting rights.

German banks are also able to influence corporate governance through their positions on the supervisory boards of large firms, where they act as equity-holder representatives. Table 3 shows both the number of supervisory board seats held by banks in the full sample, and, since the chairman of the supervisory board typically has much closer contact with the firm's management than do other supervisory board members, the number of cases in which a bank representative was chairman of the supervisory board. Bank supervisory board representation was, like bank control of voting rights, concentrated among the listed firms, and in the hands of the three big banks. Bank representatives were not in a position to dominate supervisory boards numerically, however,

Table 3: Bank supervisory board representation

| | Three big banks | | All other banks | | All banks | |
	All firms	Listed firms	All firms	Listed firms	All firms	Listed firms
Number of seats	121	104	52	41	173	145
% of equity-holder seats	10.1	13.0	4.3	5.1	14.4	18.1
Number of chairmen	16	14	8	8	24	22
% of all chairmen	10.1	13.6	5.1	7.8	15.2	21.4

since typically the equity-holder representatives comprised only half the supervisory board, the other supervisory board seats being held by employee representatives[7]. Because some firms had

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[7] Equity-holder representatives comprise half the supervisory board if the firm has more than 2,000 employees, and two-thirds of it if the firm has 2,000 employees or less. Most firms in the sample were in the former category.

representatives of more than one bank on their supervisory boards, the 174 bank supervisory board seats corresponded to bank representation on the supervisory boards of 97 of the 158 firms in the sample: 72 firms had at least one supervisory board member from one of the three big banks.

Equity-holder supervisory board representatives are elected at the annual general meetings of equity-holders. The question therefore arises of the extent to which bank supervisory board representation was determined by bank control of equity voting rights. Table 4 reports the results of estimating regressions which use measures of bank control of equity voting rights to explain two different dependent variables: the proportion of total supervisory board seats held by bank representatives, and whether the chairman of the supervisory board was a banker. In each case a separate regression was estimated for the three big banks and for other banks. When the dependent variable was the proportion of total seats, a tobit regression model was estimated; when it was bank chairmanship (a zero-one variable) a logit regression model was estimated. The results show that both measures of the three big banks' supervisory board representation were significantly related to their own equity holdings and their exercise of proxy votes. There was no difference between the effects of these two sources of big bank control of voting rights: for both equations (1) and (2) in Table 4, the null hypothesis of no difference in the estimated coefficients of equity holdings and proxy votes cannot be rejected. For the other banks, the proportion of supervisory board seats held was significantly related only to their own equity holdings and not to their proxy votes. However, supervisory board chairmanship by the other banks was significantly related to their proxy votes at the 0.10 level, as well as to their equity holdings at the 0.01 level, and the null hypothesis of no difference between the estimated coefficients of equity holdings and proxy votes cannot be rejected at the 0.05 level for equation (4) in Table 4.

Bank supervisory board representation was, therefore, partly determined by bank control of equity voting rights. However, the regressions in Table 4 explain only some of the observed variation in bank supervisory board representation, suggesting that such representation depends on other factors as well as on bank control of voting rights. There were 65 firms in the sample in which banks controlled no equity voting rights at all: of these, nearly half (32) had bank supervisory board representatives, and in two of them the chairman of the supervisory board was a bank representative. Bank supervisory board representation cannot, therefore, be explained solely as reflecting bank control of equity voting rights.

Table 4: Regressions explaining bank supervisory board representation in terms of bank control of equity voting rights

A. Three big banks

		Independent variables		
Dependent variable	Constant	Percentage of big banks' equity holdings	Percentage of big banks' proxy votes	
1. Big banks' seats as proportion of total	-3.71*** (1.36)	0.429*** (0.095)	0.551*** (0.152)	Chi-squared(2)= 38.50*** Factor for calculation of marginal effects = 0.501
2. Chairman from big banks	-3.57*** (0.53)	0.112*** (0.027)	0.104** (0.044)	Chi-squared(2)= 29.64*** Factor for calculation of marginal effects = 0.056

B. Other banks

		Independent variables		
Dependent variable	Constant	Percentage of other banks' equity holdings	Percentage of other banks' proxy votes	
3. Other banks' seats as proportion of total	-7.37*** (1.90)	0.340*** (0.102)	0.131 (0.183)	Chi-squared(2)= 13.85*** Factor for calculation of marginal effects = 0.291
4. Chairman from other banks	-4.54*** (0.79)	0.112*** (0.032)	0.101* (0.058)	Chi-squared(2)= 23.50*** Factor for calculation of marginal effects = 0.022

Notes.
1. Equations 1 and 3 were estimated by tobit maximum likelihood, and equations 2 and 4 were estimated by logit maximum likelihood
2. Figures in brackets are standard errors
3. * indicates significance at the 0.10 level, ** indicates significance at the 0.05 level, and *** indicates significance at the 0.01 level.

5. Banks, large equity-holders, and corporate governance

Having described the main features of the dataset, we now turn to empirical analysis of the effects of large equity-holders and banks on corporate governance in Germany. The general approach is to estimate regression equations relating firm profitability to measures of equity-holder concentration and bank involvement as well as to a number of other variables that might influence firm profitability. Before the regression results are presented, however, a number of issues need to be discussed.

5.1   Specification issues

Several specification issues arise with respect to the measures of equity voting rights controlled by banks and large non-bank equity-holders. Because of the conventional focus on the role of banks in German corporate governance, a distinction was made between equity voting rights controlled by banks and by non-banks. The regression equations included, as independent variables, measures of the proportion of voting rights under bank control, and measures of the proportion of voting rights controlled by the largest three identifiable non-bank equity-holders. To allow for the possibility that the relationship between firm profitability and the extent of concentration of equity ownership may be non-linear, the various measures of equity voting rights controlled were included in the regression equation in squared as well as unsquared form.

As the description of firm ownership structure in the previous section showed, many of the large non-bank equity-holders were other German non-banks, governments, and foreign firms. All of these are organisations run by agents who do not necessarily have any direct interest in using the equity holding to improve the profitability of the firm in which the equity is held. The standard argument that a large equity-holder will have incentives to monitor the management of the firm, and take actions to ensure that the firm is run efficiently, presumes that the large equity-holder's wealth will be increased by such behaviour. This presumption is appropriate for those large equity-holders which are individuals or families, but it is not obviously so for the large equity-holders which are organisations run by agents. It may be the case that the agents running these organisations have been given incentives which mean that they act as if they have a direct interest in using the equity stake to improve firm profitability, but this cannot be assumed a priori. For this reason, the regression equation included interactive variables to indicate, for each of the three largest non-bank equity holdings, whether the holder was an individual or family, a German non-bank enterprise, a public sector body, or a foreigner.[8] Any differences in the effects of large

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[8] Dummy variables were created for each of the following categories of non-bank equity holder: family, German non-bank enterprise, and public sector body. Foreigner is the category which does not have a dummy variable, to avoid the dummy variable trap. The interactive variables are then created by multiplying each of the three largest non-bank equity holdings by these four dummy variables.

non-bank equity holdings on firm profitability according to the type of equity-holder will be reflected in the coefficients of these interactive variables.

German banks' control of equity voting rights derives from both the equity owned by the banks and the proxy votes that the banks exercise on behalf of others. Banks are, of course, organisations run by agents, so that it is not obvious that banks' own equity holdings will necessarily be used to improve firm profitability. However, since use of the banks' own equity holdings in this way will increase the value of the banks' equity stakes, it is possible that the agents running the banks face appropriate incentives to act in this way. The position is different in those cases where banks control proxy votes but do not own any equity. In these cases the benefit of using proxy votes to improve firm profitability accrues not to the banks but to those shareholders who have delegated the exercise of their voting rights to the banks, and it is not clear why the banks should incur the costs involved in using proxy votes to improve profitability.[9] For this reason, bank control of voting rights deriving from equity owned by banks and bank control of voting rights deriving from proxy votes appear as separate variables in the regression equation, to allow for the possibility of different effects on firm profitability.

As was shown in the previous section, bank control of equity voting rights was concentrated in the hands of the three big banks. The regression equation therefore included separate variables for the votes controlled by the three big banks, in the form of both equity holdings and proxy votes, and the votes controlled by all other banks, also in the form of equity holdings and proxy votes.

We now consider the appropriate specification of the variables relating to bank supervisory board representation. As in the case of bank control of voting rights, all bank supervisory board representation variables are measured separately for the three big banks and all other banks. Separate variables were included in the regression equation measuring the proportion of the total supervisory board membership that were bank representatives (distinguishing between the three big banks and all others), and whether the chairman was a bank representative (again distinguishing between the three big banks and all others). The first of these supervisory board variables contains the chairman if this position is held by a banker, so the second variable is included to allow for the possibility that bank chairmanship of the supervisory board has effects on firm profitability additional to those of ordinary bank membership. As the results reported in Table 4 show, bank supervisory board representation is partly determined by bank control of equity voting rights, and hence it is inappropriate to include both actual bank supervisory board representation and bank control of equity voting rights as independent variables in a regression

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[9]   See Edwards and Fischer (1994), pp.214-218, for a more detailed discussion.

equation which attempts to estimate the separate effects of these two components of banks' corporate governance role. Gorton and Schmid (1996) argue on these grounds that bank supervisory board representation should not be used as an independent variable, but this argument neglects the fact that, as was shown in the previous section, bank supervisory board representation is often observed in the absence of any bank control of voting rights. The approach adopted here is to use the differences between the actual and predicted values from the estimated regression equations in Table 4 as the measures of bank supervisory board representation: the interpretation of these variables is that they are measures of that part of bank representation which cannot be explained by bank control of voting rights, which will henceforth be referred to as the pure effect of bank supervisory board representation.

An important general question which must be considered in a regression analysis of the relationship between firm profitability and variables measuring ownership by banks and non-banks, bank control of voting rights via proxy votes, and bank supervisory board representation, is whether these variables are genuinely exogenous with respect to firm profitability. There are two justifications for regarding them as exogenous. The first is that, in general, the ownership structure of large German firms and their connections with banks via proxy voting and supervisory board representation do not change much over time. The second is that, as explained in Section 3 of the paper, the sample of firms analysed here excludes firms which experienced any significant change in their ownership structure or their connections with banks during the five-year period over which profitability was measured.

We turn now to the question of how best to measure firm profitability. All profitability measures used in the regression analysis are based on accounting profitability data, despite the well-known deficiencies of such data in terms of providing information about economic profitability.[10] There are two reasons for the use of accounting-based measures rather than measures based on stock market returns. One is that only 103 of the 158 firms in the sample are listed, so that market-based profitability measures are simply not available for 55 firms in the sample. The other arises from the efficient markets hypothesis. The aim of the regression analysis is to relate firm profitability to variables such as ownership structure and connections with banks that are stable over time and hence predictable by investors. Any systematic effect of, say, ownership structure on firm profitability will, under the efficient markets hypothesis, be reflected in share prices at the start of the period over which profitability is measured and hence should not affect the stock-market-based profitability measure.[11] Thus, in order to be able to assess whether

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[10]   See Harcourt (1965) and Fisher and McGowan (1983).

[11]   Estimation of regression equations using stock-market-based performance as the dependent variable supported this hypothesis. When a general regression model including all the independent variables discussed in this section was estimated for the sub-sample of 103 listed firms using stock-market-based performance measures, the only independent variables which could not be excluded from the regression

ownership structure and bank involvement affects the profitability of large firms in Germany, accounting profitability measures have to be used. Such measures have been used in other empirical studies of banks and corporate governance in Germany (e.g. Cable (1985), Gorton and Schmid (1996)). Their use can also be justified by noting, following Whittington (1979), that studies of the relationship between accounting and economic measures of profitability suggest that there is a great deal of random error in this relationship, but not necessarily any systematic bias, and it is the latter which would preclude using accounting profitability as a proxy for economic profitability in econometric analysis.

Three different accounting profitability measures were used in the empirical analysis. The basic aim in choosing profitability measures was to obtain measures of firms' return on total capital, and their return on equity capital. The two measures used for this were, firstly, earnings gross of interest, tax and extraordinary items as a fraction of total assets (Y_1), and, secondly, ordinary profits (net of interest, but gross of tax and extraordinary items) as a fraction of total assets less total liabilities (Y_2). Both measures are averages over the five-year period 1988-1992. Kay (1976) emphasised that the articulation of accounts (so that balance sheet changes pass through the profit statement) is essential if accounting profitability data are to provide a reasonable measure of economic profitability, and for this reason the two measures Y_1 and Y_2 are both based on a profit measure which is gross of extraordinary items. However, a characteristic of German accounting practice is that all assets are valued at historic cost, and upward revaluation is not permitted under any circumstances. Consequently the balance sheet value of firms' assets is often well below the value that could be raised by selling the assets. The sale of assets for more than their balance-sheet value is a significant influence on the accounting profits of German firms, and enables them to realise extraordinary profits which increase the overall profit figure for a year. Since the aim is to obtain measures of firm profitability over the period 1988-1992, it is possible that including large extraordinary items in the accounting profitability measures may lead to a bias which does not have time to reverse over such a relatively short period. Kay's argument for articulation is that, over a sufficiently long period, biases resulting from accounting adjustments will reverse so that a suitable average will be a good approximation to economic profitability, but this argument is less compelling over a five-year period. Hence a third accounting profitability measure, which does not satisfy the articulation requirement, is also used: this is earnings gross of interest and tax but net of extraordinary items as a fraction of total assets (Y_3), averaged over 1988-1992. The correlation coefficients for these three accounting profitability measures are as follows:

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equation were the constant and an industry dummy. Estimation of the regression model for this sub-sample using accounting-based performance measures, however, produced results that were not significantly different from those reported in Tables 5 and 6 below. See Nibler (1998) for further details.

	Y_2	Y_3
Y_1	0.862	0.577
Y_2		0.658

Clearly Y_1 , Y_2 and Y_3 are not perfectly correlated, so that the use of all three measures in the econometric analysis is worthwhile.

The final specification issue to consider is the other variables to be included as independent variables in the regression equations. The objective of the analysis is to establish the effects of ownership structure and bank involvement on firm profitability controlling for all other possible influences on profitability, and there are in principle many such influences. The other independent variables included were the following. First, each firm was categorised as primarily operating in one of thirteen different industries, so that twelve industry dummy variables were included to allow for possible systematic differences in accounting profitability between industries. Second, since Cable (1985) found that the organisational form of firms had a significant effect on profitability, three dummy variables were included indicating whether a firm was a holding company, a multidivisional enterprise, or a strategically diversified enterprise. Finally, the five-year average value of turnover for each firm was included to allow for possible effects of firm size on profitability.

5.2   Model selection

The approach used in the econometric analysis was to begin by estimating, for each of the three profitability measures Y_1 , Y_2 and Y_3, a very general regression equation which included all the independent variables discussed above, and then to test whether some of these independent variables could be excluded from the regression equation. The reason for adopting this approach is that theory provides little guidance as to the appropriate form of the regression equation. In order to minimise the possibility of error in the specification of the regression equation it was considered best to begin with an over-parameterised model on which restrictions were then imposed. The problem with this approach, of course, is that the over-parameterisation of the equation is likely to reduce the precision of the estimates, so that care must be taken when testing whether variables can be excluded from the regression. In order to ensure that variables were not erroneously excluded from the regression equation, tests involving both the exclusion of variables from the general equation and their addition to the restricted equations reported below were carried out.

Theory provides only limited guidance as to the <u>a priori</u> expectations about the estimated coefficients in the regression equation. Large non-bank equity-holders are expected to have a positive effect on profitability, at least up to some point; it may be that the effect declines beyond

this point. The expectation is thus for positive coefficients on the unsquared large non-bank equity holding terms, and negative coefficients on the squared terms if the relationship is non-linear in this way. It is unclear from theory whether there are distinct effects of the largest non-bank equity-holder, the second-largest, and so on: the holdings of the three largest non-bank equity-holders were included separately in the general equation to allow for possible different effects. As was noted earlier, it is possible that different types of large non-bank holders may have different effects on profitability: if this is the case, the interactive variables which identify the types of large non-bank equity-holders will have significantly different coefficients.

Banks can affect profitability through three different channels: their own equity holdings, the proxy votes they exercise, and their representation on supervisory boards. If banks play a role in corporate governance which is distinctive from that of large equity-holders in general, then either the estimated effects of bank equity holdings should be larger than those of other large equity-holders, or the estimated coefficients of at least some of the variables relating to proxy votes and supervisory board representation should be positive, as well as those relating to banks' own equity holdings. The effect of banks' control of equity voting rights on profitability, whether deriving from their own holdings or from proxy votes, may be non-linear: if it is, at least some of the relevant squared variables should have non-zero coefficients. It is possible that banks have a greater corporate governance role through chairmanship of supervisory boards than via ordinary membership, in which case the estimated coefficient of the bank chairmanship variables should be positive. It is also possible that the three big banks play a more important role in corporate governance than the other banks, in which case the estimated effect of the variables relating to these three banks should be larger than those relating to the other banks.

A final model selection issue which has to be considered concerns the different types of firm in the sample. The full sample of firms falls into three groups: listed firms, unlisted firms which are legally permitted to issue shares (AGs and KGaAs), and unlisted firms which cannot issue shares (GmbHs and others). As the previous section showed, banks' potential role in corporate governance is greater for the listed firms than the others. Hence tests were conducted to assess whether the same regression model applied to all three groups of firms.[12] The results of these tests consistently showed that a single regression model applied to listed firms and unlisted firms which could issue shares (i.e. to listed and unlisted AGs and KGaAs), but a different model applied to the unlisted firms which could not issue shares. The conclusion to be drawn is that the nature of corporate governance for large German unlisted firms which are not AGs or KGaAs is different to that for large AGs and KGaAs (whether listed or unlisted). The reasons for this difference are unfortunately not clear: since there were only 22 unlisted firms which could not

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[12]   The tests used were the Chow test of stability of the regression coefficients (where feasible) and the Chow test of the adequacy of predictions.

issue shares in the full sample, there were insufficient data available to explore this question.[13] No regression results are reported for this group of firms. The results reported below are for the sub-sample of 136 AGs and KGaAs.

5.3   Results

Table 5 shows the results of estimating a considerably restricted version of the general regression model for each of the three accounting profitability measures. The restrictions required to obtain the regressions shown in Table 5 from the general model are all acceptable at the 0.01 level according to a Wald test. The regressions in Table 5 were all estimated by OLS. For all three regressions, the Ramsey RESET test using the square of the fitted values does not reject the null hypothesis of correct specification. The Breusch-Pagan LM test for heteroscedasticity does not reject the null hypotheses of homoscedastic errors for the regressions with Y_2 and Y_3 as dependent variables, but it does reject this null hypothesis for the regression with Y_1 as dependent variable. White heteroscedasticity-consistent standard errors are therefore given for this regression.

Before discussing the results in Table 5, it should be noted that the acceptability of the restrictions required to obtain these regressions from the general model enables a number of conclusions to be drawn about the role of large non-bank equity-holders and banks in German corporate governance. First, all the squared voting terms, whether bank or non-bank, can be excluded from the regressions. Hence there is no evidence of any non-linearity in the relationship between profitability and either concentration of non-bank equity ownership or bank control of equity voting rights. Second, the bank proxy vote variables can be excluded from the regression, and thus there is no evidence that German banks use their control of proxy votes to improve firm profitability. Third, the bank supervisory board chairman variables can be excluded. Despite the particularly important role played by the chairman of the supervisory board, there is no evidence of any additonal effect of bank supervisory board representation on firm profitability when a bank representative is chairman. Fourth, the third-largest non-bank equity-holder can be excluded, and the estimated coefficients of the largest and second-largest non-bank equity holders can be restricted to be equal, suggesting that the concentration of ownership among the two largest non-bank equity-holders is what matters in terms of influencing firm profitability. Finally, most of the interactive terms which attempt to identify differences in the effects of different types of large non-bank equity-holders can be excluded: as will be discussed more fully below, it is only for large public sector equity owners that evidence of a differential effect on profitability exists. It was possible to impose the restriction of equality between the estimated coefficients of the

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[13] There were too few observations to estimate a very general regression model for the 22 unlisted firms which could not issue shares, and when the simple models reported below were estimated for this group of firms, the null hypothesis that the specification was correct was rejected.

interactive terms identifying largest and second-largest non-bank equity holders which are public sector bodies.

Table 5: Regression results explaining firm profitability in terms of bank influence and equity ownership concentration

	Dependent variable		
	Y_1	Y_2	Y_3
Independent variables			
Constant	5.277***	6.396***	3.848***
	(0.865)	(1.596)	(1.077)
Construction dummy	-4.963***	-3.319	-1.285
	(0.490)	(2.493)	(1.682)
Supervisory board representation of three big banks as % total	-4.860	8.207	19.580***
	(5.673)	(11.050)	(7.458)
All banks' equity holdings	0.030	0.066	0.025
	(0.020)	(0.051)	(0.035)
Largest two non-bank equity holdings	0.021*	0.051**	0.032**
	(0.012)	(0.021)	(0.014)
Largest two non-bank equity holdings x public sector dummy	-0.043***	-0.077***	-0.056***
	(0.009)	(0.028)	(0.019)
Summary statistics			
R^2	0.159	0.100	0.145
$\overline{R}^2$	0.126	0.065	0.112
F (5,130)	4.899***	2.885**	4.403***

Notes.
1. Figures in brackets are standard errors (White heteroscedasticity-consistent for the Y_1 regression).
2. * indicates significance at the 0.10 level, ** indicates significance at the 0.05 level, and *** indicates significance at the 0.01 level.

The acceptability of the restrictions required to obtain the regressions in Table 5 also means that almost all of the other independent variables included in the general model – industry and organisational form dummies, and turnover – can be excluded. Only one industry dummy

variable, that for construction, has any significant effect on firm profitability, and this is only for one profitability measure.

The results shown in Table 5 are reasonably consistent across the three different profitability measures used as dependent variable, although not completely so. The estimated coefficient of the largest two non-bank equity holdings is positive and significant at the 0.05 level in the regressions using Y_2 and Y_3 as dependent variable, and very nearly (but not quite) significant at this level in the regression where Y_1 is the dependent variable. The interactive variable for cases in which one or both of the largest two non-bank equity-holders are public sector bodies is significantly negative at the 0.01 level in all three regressions. The null hypothesis that the effect of the largest two non-bank equity-holders on profitability is zero when one or both of these holders are public sector bodies cannot be rejected at the 0.05 level for all three regressions. The estimates therefore imply that firm profitability is not affected by increases in the holdings of the largest or second-largest non-bank equity owner when such owners are public sector bodies, but for all other non-bank equity owners increases in these holdings increase profitability. If the largest two non-bank equity owners are not public sector bodies, the estimated proportional increase in profitability when the holdings of these owners rise from 0 to 100% (calculated at the sample mean values of all other variables) is 42.9% for the Y_1 regression, 82.5% for the Y_2 regression, and 87.8% for the Y_3 regression.

In all three regressions shown in Table 5, the estimated coefficient of the equity holdings of all banks together, although positive, is not significantly different from zero even at the 0.10 level. The inclusion of banks' own equity holdings as an independent variable in this form reflects the fact that no evidence was found of any statistically significantly difference in the estimated effects of the equity holdings of the three big banks and of the other banks. These results suggest that the effects of the equity holdings of the three big banks and of the other banks on firm profitability do not differ: in both cases there is no statistically significant effect.

The results discussed so far have been consistent across the three regressions shown in Table 5. Unfortunately, this is not true for the results relating to the pure effect of the supervisory board representation of the three big banks as a proportion of total supervisory board membership (i.e. that part which cannot be explained by bank control of voting rights). When Y_3 is the dependent variable, this variable has a positive estimated coefficient which is significant at the 0.01 level,[14] but in the other two regressions its estimated coefficient is not significantly different from zero. The pure effect of supervisory board representation by the three big banks is thus significant but very small in one regression, and insignificant in the other two, so that the results

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[14] To interpret the size of the estimated effect in the Y_3 regression, note that the implied elasticity (at the sample mean values) is 0.015, so the effect, although significant, is very small.

provide no support for an economically significant effect of this variable on profitability. It should also be noted that the results relating to this variable are the only ones which suggest a possible difference in the effects of the three big banks and the other banks: no evidence was found that the estimated coefficient of the supervisory board representation of the other banks was ever significantly different from zero.

The absence of any significant effect of banks' equity holdings in the regressions shown in Table 5 is puzzling, given that profitability was positively influenced by the size of the holdings of the largest two non-bank equity holders. It is difficult to see why large bank equity holdings should not affect profitability when, for example, large equity holdings by non-bank enterprises do have a positive influence. It should be noted that, although the null hypothesis that bank equity holdings do not influence firm profitability cannot be rejected at conventional levels for all three regressions in Table 5, the null hypothesis of equality between the estimated coefficients of the bank equity holdings and largest two non-bank equity holdings variables similarly cannot be rejected for these regressions. The estimated coefficient of the bank equity holdings variable is not sufficiently well-determined to enable precise conclusions about the effects of bank equity ownership to be drawn.

These considerations suggest an alternative formulation of the regression model. Instead of distinguishing between the equity holdings of banks and of non-banks, as is done in Table 5, the large equity holding variables were reformulated as the largest and second-largest equity holdings, including banks as well as non-banks. Interactive variables were included to indicate, for each of the two largest equity holdings, whether the holder was a family, a non-bank enterprise, one of the three big banks, one of the other banks, or a public sector body.[15] Tests of the significance of these interactive variables showed that all except those relating to large public sector equity owners could be excluded from the regression model. It was also possible to impose the restrictions of equality between the estimated coefficients of the largest two equity holding variables, and equality between the estimated coefficients of the interactive terms identifying largest and second-largest equity holders which were public sector bodies. Table 6 shows the results of estimating this alternative formulation of the regression model subject to these restrictions.

The results in Table 6 are similar to those in Table 5. The construction dummy variable is significant in the estimated regressions with Y_1 as dependent variable, and the pure effect of supervisory board representation by the three big banks is significantly positive in the estimated regression with Y_3 as dependent variable. The interactive variable which identifies cases in which

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[15] As before, foreigner is the category without a dummy variable.

Table 6: Regression results explaining firm profitability in terms of bank influence and equity ownership concentration: alternative formulation

	Dependent variable		
Independent variables	Y_1	Y_2	Y_3
Constant	5.702***	7.251***	4.145***
	(0.726)	(1.327)	(0.895)
Construction dummy	-4.801***	-3.032	-1.323
	(0.529)	(2.423)	(1.633)
Supervisory board representation of three big banks as % total	-4.429	9.081	19.907***
	(5.681)	(11.015)	(7.425)
Largest two equity holdings	0.016	0.042**	0.028**
	(0.011)	(0.019)	(0.013)
Largest two equity holdings x public sector dummy	-0.043***	-0.078***	-0.056***
	(0.009)	(0.028)	(0.019)
Summary statistics			
R^2	0.153	0.093	0.140
$\overline{R}^2$	0.127	0.065	0.114
F (4,131)	5.900***	3.353**	5.348***

Notes.
1. Figures in brackets are standard errors (White heteroscedasticity-consistent for Y_1 regression).
2. * indicates significance at the 0.10 level, ** indicates significance at the 0.05 level, and *** indicates significance at the 0.01 level.

one or both of the two largest equity-holders were public sector bodies is significantly negative in all three regressions. The estimated coefficient of the largest two equity holdings is positive and significant at the 0.05 level in the equations with Y_2 and Y_3 as dependent variable, but with Y_1 as dependent variable the estimated coefficient of this variable is not significantly different from zero even at the 0.10 level. Overall, these results suggest that the alternative formulation of the regression model, in which large equity holdings of banks are not distinguished from those of non-banks (except for public sector bodies), but are included in a single large equity-holder variable, is not obviously inferior to the original formulation. This conclusion is supported by the results of

non-nested tests of the specifications of the regression models shown in Tables 5 and 6: for all three dependent variables, neither model was rejected by the other.

The evidence on the effects of large bank equity holdings is thus consistent with the hypothesis that these have similar effects on firm profitability as do large holdings by other types of owner, except public sector bodies. It must be recognised, however, that the evidence on this hypothesis is not clear-cut, since the effects of large bank equity holdings cannot be determined very precisely. But it is possible to say that there is almost no evidence to support the view that German banks play a role in corporate governance which is distinct from their position as one of several different types of large equity-holders. Bank control of proxy votes has no statistically significant effect on firm profitability. The pure supervisory board membership of the three big banks has a significantly positive (but very small) effect on one of the three measures of firm profitability, and no significant effect for the other two measures. There is no evidence of bank supervisory board representation having a greater effect on firm profitability when a banker chaired the supervisory board.

The main conclusion of the econometric analysis reported in this section is that the profitability of large German AGs and KGaAs is positively influenced by the extent of their ownership concentration, unless the large owners are public sector bodies. There remains some uncertainty as to whether the appropriate measure of ownership concentration is the holdings of the largest two owners including or excluding banks, since the effects of large bank equity holdings are not well-determined. But the evidence is consistent with the hypothesis that all types of large owners except public sector bodies have similar positive effects on profitability. Large equity holdings by public sector bodies have no positive effect on profitability. The fact that many of the largest owners of these firms are organisations run by agents does not appear to affect the positive effect of ownership concentration on firm profitability, unless the largest owners are public sector bodies. This suggests that non-public sector organisations have appropriate mechanisms in place to ensure that the agents running them act as if they have a direct interest in using large ownership stakes to improve firm profitability. It also suggests that large public sector ownership stakes in firms are associated with inadequate monitoring of firms' management.

Two other results of the analysis in this section are worth restating. One is that there is no evidence that the relationship between profitability and ownership concentration for large German AGs and KGaAs is non-linear. The other is that the nature of corporate governance, as expressed by a regression model relating firm profitability to ownership concentration and bank variables, differs between large German firms which are AGs and KGaAs and those which take other legal forms. The reasons for this difference are not understood, and it is an issue which requires further research.

6. Conclusion

The main conclusions of the paper can be stated straightforwardly. Section 4 showed that the ownership of large German firms is highly concentrated, and that banks have the potential, via ownership, control of proxy votes, and supervisory board representation, to play a significant role in the governance of large German firms, in particular those that are listed. Section 5 showed that ownership concentration in general does have a positive effect on the profitability of large German AGs and KGaAs, except when the large owners are public sector bodies. It also showed that, in terms of effects on firm profitability, there is no economically significant evidence that German banks play a role in corporate governance which is distinct from their position as one of several different types of large equity-holder.

The results reported in Section 5 of this paper are consistent with Edwards and Fischer's (1994) interpretation of Cable's (1985) results, rather than Cable's own interpretation. These results are also broadly consistent with Gorton and Schmid's (1996) results for their 1985 sample, but they are inconsistent with Gorton and Schmid's results for their 1974 sample. The empirical analysis in this paper is based on a larger and more detailed dataset than earlier studies, and the results point to a clear resolution of the ambiguity in the conclusions of these earlier studies. The overall conclusion of this paper is that of the two distinctive features of the German corporate governance system – ownership concentration and the role of banks – it is the former for which there is definite evidence of a positive effect on firm profitability. There is no evidence of German banks having an economically significant role in corporate governance beyond that of being, along with many non-banks, owners of large equity stakes in some firms.

As for the broader issues raised by an evaluation of alternative corporate governance systems, the results of this paper show that claims of the superiority of the distinctive 'bank-based' German system are without empirical foundation. The characterisation of the German system by Shleifer and Vishny (1997) as one involving "governance by both permanent large shareholders...and by banks" is incorrect, in so far as it implies a role for banks distinct from that of large shareholders. The evidence presented in this paper suggests that, for large German firms, only large equity-holders play a role in corporate governance. It follows that, while it may be possible to argue for the merits of the German system in terms of its high ownership concentration, it is not possible to do so in terms of the distinctive role of banks, since there is no evidence of banks having such a role in Germany.

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