

**Cross-Listing, Close Bank-Firm Relationships
and Ownership Structure: Empirical Evidence
on Corporate Governance Mechanisms**

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1. Introduction

Corporate governance system is a set of mechanisms and institutions that protect investors and assure that they get return on their investments. In particular, corporate governance system includes factors that bond managers from acquiring private benefits of control and misusing firm's capital provided by outside investors. Corporate governance system is identified in the previous literature as a key determinant of managerial behaviour and corporate policy choices (e.g., Shleifer and Vishny, 1997; La Porta, Lopez-de-Silanes, Shleifer and Vishny, 2000). According to Shleifer and Vishny (1997), there are two most common approaches to corporate governance: legal protection of outside investors and ownership by large investors. The first approach focuses on the role of regulations, their scope, quality and enforcement. The second approach builds on the power of large investors who are able to exercise investor rights through monitoring managers.

This thesis addresses the issue of different corporate governance mechanisms across European and US markets. Common law origins and dispersed ownership are characteristic for Anglo-Saxon countries, where funds are raised mainly from public sources. These peculiarities involve well developed securities markets and strong and effective legal regulations designed to protect debt holders and shareholders against any form of managerial expropriation. La Porta, Lopez-de-Silanes, Shleifer and Vishny (1998) demonstrate that common law countries provide the strongest legal protection for investors and creditors in the world and that the corporate governance mechanisms in Anglo-Saxon countries rely heavily on the law and its enforcement. Strict disclosure requirements imply high firm's visibility and improved information environment, and high level of liability standard, criminal sanctions and their public enforcement further protect investor rights (La Porta, Lopez-de-Silanes and Shleifer, 2005).

The US corporate governance system and its mechanisms are considered as the most developed and the most effective in protecting investors (La Porta et al. 1998, 2005).

In Germany, close bank-firm relationships act as a primary corporate governance mechanism and improve the effectiveness of law that protects both large and minority investors. The German corporate governance system originates from the so-called bank economy, which is in contrast to the capital market system driven in Anglo-Saxon countries and is similar to the Japanese model. In Germany, funds are traditionally raised from private sources, and banks often influence companies as shareholders and as 'Hausbanken' (henceforth: house banks). The equity holdings are associated with exercising equity rights, proxy voting on behalf of minority shareholders and nominating representatives to supervisory boards (Franks and Mayer, 1997, 2001; Gorton and Schmid, 2000). The relationship between a house bank and a company implies a long-term financing commitment, where the house bank is a primary banker receiving more appropriate and timely information than any other external financing supplier (Elsas and Krahn, 2003). The German corporate governance system focuses on information intensive, long-term relationships between universal banks and firms, and is aimed to guarantee long-term development and stability of the firm (e.g., Edwards and Fischer, 1996).

Emerging markets are examples of weak investor protection and poor law enforcement (Johnson, La Porta, Lopez-de-Silanes and Shleifer 2000; Denis and Connell, 2003; Klapper and Love, 2004). This implies lack of fundamental governance institutions responsible for undertaking monitoring and disciplinary actions when managers exercise private benefits of control (La Porta et al., 1998). Furthermore, in a study of European emerging countries, Pistor, Raiser and Gelfer (2000) report a large discrepancy between the law on the books, and the level of its enforcement. Although

the law on the books is of a very good quality, there is a considerable deficit of institutions that effectively enforce the regulations.

La Porta et al. (1998) find that weak investor protection and poor law enforcement are frequently linked to concentrated ownership that may suggest that the concentration of ownership is a form of adaptation to poor legal protection. Only large shareholders can avoid being expropriated by managers, and moreover, minority shareholders who fear expropriation are willing to buy shares at low price only, further leading to concentrated holdings. According to Shleifer and Vishny (1986) some ownership concentration is often efficient because large shareholders may monitor insiders. In light of poor corporate governance mechanisms in emerging markets, there is evidence that unrelated block ownership can have a positive effect there. Lins (2003) analyses how ownership structure is related to firm value in emerging markets and finds that large non-management block holdings increase firm value. He suggests that unrelated block owners can help to improve weak corporate governance system by acting as a partial substitute for missing investor protection rights and legal enforcement. The case of the emerging Polish corporate governance system is explored in this thesis in details.

The main aim of this thesis is to test the effectiveness of the corporate governance mechanisms in different institutional settings, in the United States, United Kingdom, Germany and Poland. More specifically, this thesis looks for empirical evidence to answer the following questions: (i) is cross-listing in the United States an effective corporate governance mechanism reducing the profitability of insider trading? (ii) what is the influence of close bank-firm relationships on corporate investments? (iii) how does the corporate ownership structure affect the information content of accounting earnings?

To test the effectiveness of cross-listing as a corporate governance mechanism in Anglo-Saxon countries the thesis considers profitability of insider trading in British companies listed on the London Stock Exchange (LSE) and cross-listed in the United States. This research focuses on implications of the differences between British and US regulatory and corporate governance systems for insider trading. Companies that cross-list in the United States automatically rent US legislation and have to comply with US legal requirements, including the insider trading law. Therefore, insiders of cross-listed companies are subject to both British and US regulations.

If both markets on which the company is listed have good corporate governance systems that prevent insiders from taking advantage of private information, then the two legal systems are expected to decrease the trading profits of insiders and insider trading is likely to be undertaken for liquidity rather than information purposes. In case when the corporate governance system of the domestic market is weaker than the one of the foreign market, managers are bonded from taking excessive private benefits by cross-listing firm's stock on the foreign exchange (Cofee, 1999, 2002; Stulz, 1999). The idea behind the 'bonding hypothesis' is that a company cross-listed on a foreign exchange with a better corporate governance system becomes subject to increased disclosure requirements, stronger and more effective legal system, and more thorough investors monitoring.

Consistent with this hypothesis, firms from countries with weaker legal systems are likely to cross-list in countries with stronger law and to benefit from cross-listing (e.g., Reese and Weisbach, 2002, Doidge, 2004 and Doidge, Karolyi and Stulz, 2004). Moreover, cross-listing in the United States decreases information asymmetry and improves firm's visibility through greater analyst coverage, better accuracy and increased media attention (Baker, Nofsinger, Weaver, 2002; Lang, Lins and Miller,

2003, 2004). Ejara and Ghosh (2004) suggest that IPOs in international markets have less information asymmetries due to stricter reporting requirements and are less likely to be underpriced. These arguments suggest that insider trading activity is likely to differ between companies that are domestically quoted on the LSE and cross-listed in the United States. We, therefore, test the hypothesis that managers of cross-listed companies are less likely to trade on private information. Accordingly, one expects that insider trading in cross-listed companies is significantly less profitable than in companies listed domestically.

To investigate the effectiveness of close bank-firm relationships as a corporate governance mechanism the thesis investigates financial constraints of German firms. A firm is financially constrained when the access to external funds is restricted. Therefore, corporate liquidity becomes a key issue and there is a need to generate internal funds for future investments. On the contrary, a company having unrestricted access to external funds is financially unconstrained. Previous studies suggest that the effect of the relationships between banks and firms varies in different institutional settings and depends on the type of the corporate governance system features and level of information asymmetry (Houston and James, 2001; Hoshi, Kashyap and Scharfstein, 1991; Fohlin, 1998; Elston, 1998, 2004). Our investigation focuses on the unique German corporate governance system, where universal banks play an essential role and are deemed to influence corporate investment decisions (Gorton and Schmid, 2000).

Close bank-firm relationships may reduce information asymmetry and enable banks to supply more external finance to the firm for positive net present value projects. In view of the peculiarities of the German corporate governance system, the study tests whether investments are less sensitive to internally generated cash flows in companies that have close bank ties than in those without such ties. Two new measures of the close

bank-firm relationships are applied in this analysis. The first measure is bank control rights defined as direct ownership and proxy-voting rights on behalf of minority shareholders. This measure captures the real power in the decision making process, because proxy-voting gives banks additional power to influence operating, investment and financing decisions. The second measure is a number of house bank affiliations and is used in the literature for the first time in an analysis of cash flow sensitivity of investments. The house bank relationships imply long-term financing commitments, where the house banks are firms' primary bankers. The number of house bank affiliations is related primarily to cash management and lending behaviour and is not linked to firm's ownership structure. Companies with close bank ties are expected to be less sensitive to internally generated cash flows when undertaking new investment projects. The aim of this section is to investigate whether close bank-firm relationships influence cash flow sensitivity of investments in German firms.

To investigate the effectiveness of corporate governance system in an emerging market the impact of corporate ownership structure on the information content of reported accounting earnings is analysed. The informativeness of accounting earnings is measured by the extent to which they explain stock returns. This investigation examines the Polish stock market, whose emerging institutional characteristics create a unique environment to test the implications of the underdeveloped corporate governance system for the usefulness of public accounting information in stock valuation.

Managers in countries with weak investor protection may have incentives to extract private benefits of control, that is to undertake any activities that create value exclusively for them and their families and thus not for non-controlling outsiders. Abusing their strong position in conflicts with outside investors, managers may further

adopt accounting disclosure policies that conceal their activities from outsiders. Leuz, Nanda and Wysocki (2003) confirm this in a large cross-country study and find a negative correlation between the quality of corporate governance system and earnings management. They interpret their results as consistent with the argument that stronger investor protection reduces the ability to exercise private benefits of control. The reduced information content of earnings is expected to be particularly pronounced when managers have large controlling power resulting from their high stock ownership. In such cases, the quality of reported earnings may be lower, and accounting information is likely to be less useful in the stock valuation process. Accordingly, one can expect that the extent to which earnings explain stock returns will be decreasing with managerial ownership.

In emerging markets, concentration of ownership may be a form of adaptation to poor legal protection because only large shareholders can monitor managers and avoid expropriation. The literature suggests that unrelated block owners can help to improve weak corporate governance system by acting as a partial substitute for missing corporate governance mechanisms (Shleifer and Vishny, 1997; Lins, 2003). Accordingly, the following hypothesis is tested: managerial ownership has a negative impact on the information content of earnings in companies with low external block holdings and positive impact in companies with high external block holdings. It is expected that large external owners have resources and strong incentives to monitor managers' actions and thus reduce their detrimental effect on the information content of earnings.

This thesis contributes to the literature in a number of ways. In the first instance, it expands the current literature on corporate governance systems and its mechanisms in different institutional settings. Three corporate governance mechanisms are identified

and empirically investigated: cross-listing in the United States, close bank-firm relationships in Germany and ownership structure in an emerging market. Analysing the impact of cross-listing in the United States on the insider trading we contribute to the literature on international cross-listing, especially to the recent debate on legal bonding and information asymmetry. At the same time we expand the current literature on profitability of directors' dealings and discuss controversy surrounding the legality of insider trading.

The examination of the impact of close bank-firm relationships on corporate investments contributes to the discussion on the close bank ties and cash flow sensitivity of investments. More specifically, we consider the influence of close bank-firm relationships on cash flow sensitivity of investments applying two new measures of close bank ties. In light of the widely held view about a deficit of available research to assess benefits and detriments of close bank-firm relationships in Germany new empirical evidence is provided. The investigation of the impact of ownership structure on the information content of earnings develops the literature on ownership structure and tests potentially positive influence of unrelated block ownership in the weak corporate governance system. We also add to the literature on stock returns and accounting earnings, in particular to the discussion on the usefulness of the accounting earnings in stock valuation.

The effectiveness of each of the discussed corporate governance mechanisms is addressed in Chapters 2 through 4. Each of the chapters provides thorough description of related issues and motivates the analysis. The chapters describe data and applied methodological approach, and discuss the results. Chapter 5 summarises findings and presents general conclusions and main implications.

2. Cross-Listing in the United States as a Corporate Governance Mechanism

2.1. The Impact of Cross-Listing in the United States on Insider Trading

Previous studies document a significant price reaction to the announcement of insider trading and provide two main distinct reasons for these results by arguing that insiders trade either on private information or when shares in their companies are mis-priced. The former is based on the premise that insiders use privileged information to buy or sell shares in their own company and to gain significant abnormal returns on their trades. Empirically, insiders are found to trade before price sensitive information releases such as dividends announcement (John and Lang, 1991), earnings forecasts (Penman, 1982), takeovers (Seyhun, 1990; Bris, 2005), announcement of new stock offerings (Karpoff and Lee, 1991), stock repurchases (Lee, Mikkelsen and Partch, 1992), capital expenditure (John and Mishra, 1990), and bankruptcy filing (Seyhun and Bradley, 1997). Using UK data, Lasfer (2004) reports that insiders time their trades as their transactions are undertaken after significant price changes and before news announcements. Other studies, on the other hand, argue that insider trading is related to the ability of the managers to assess better the value of their company. In particular, they buy when their firm is undervalued and they sell when they consider that their shares are overvalued. For example, Givoly and Palmon (1985) introduced the 'leading indicator' that allows outside investors to track insiders' trades, because insiders are capable of assessing better their companies' values.

The use of private information unavailable to public investors results in an expropriation of outside shareholders. There is an intensive debate and many controversies as to whether insider trading should be prohibited. Comprehensive survey and summary of arguments in favour of both views are provided by Bainbridge (2002) and Bhattacharya and Daouk (2002). One stream of the literature provides evidence

that insider trading should be illegal because it transfers wealth from the uninformed to informed investors (Jaffe, 1974; Finnerty, 1976a; Seyhun, 1986; Gregory, Matatko and Tonks, 1997; Friederich, Gregory, Matatko and Tonks, 2002). These arguments have lead most countries around the world to regulate trading by insiders (Bhattacharya and Douk, 2002). However, Manne (1966), Givoly and Palmon (1985), and Muelbroek (1992) support deregulation of insider trading and argue that insider trading increases the level of market efficiency, as any private information becomes compounded into the share price. This private information could be related to the news released after the trade or, alternatively, to the insiders' assessment of the value of their firm. Moreover, the fact that fewer cases emerged from this legislation (Bhattacharya and Douk, 2002) suggests that insiders may not necessarily trade on insider information or that the laws are not binding.

The purpose of this section is to extend this line of arguments by investigating cross-listing in the United States as a corporate governance mechanism influencing insider trading. Companies that cross-list in the United States automatically rent US legislation and have to comply with US legal requirements, including the insider trading law. Therefore, insiders of cross-listed companies are subject to both British and US regulations. Even though British and US markets have similar characteristics: effective outside shareholder protection rights, dispersed ownership and common law origins the corporate governance system in the United States generally scores better in different rankings than the British corporate governance system (La Porta et al., 1998, 2005). Moreover, US market provides higher firm's visibility and improved information environment than the British market. In case when the corporate governance system of the domestic market is weaker than the one of the foreign market, managers are bonded from taking excessive private benefits by cross-listing firm's stock

on the foreign exchange (Cofee, 1999, 2002; Stulz, 1999). The idea behind the 'bonding hypothesis' is that a company cross-listed on a foreign exchange with a better corporate governance system becomes subject to increased disclosure requirements, stronger and more effective legal system, and more thorough investors monitoring. These arguments suggest that insider trading activity is likely to differ between companies that are domestically listed and cross-listed in the United States. Therefore, this study tests the hypothesis that managers of cross-listed companies are less likely to trade on private information. Accordingly, one expects that insider trading in cross-listed companies is significantly less profitable than in companies listed domestically.

This investigation concentrates on insider trading in British companies cross-listed in the United States for three reasons. First, prior works by Gregory et al. (1997), Friederich et al. (2002), Hillier and Marshall (2002) and Lasfer (2004) document trading on privileged information by managers of British companies. Second, British companies are the largest group of European cross-listed companies (171) and third largest in the world, after Canada (266) and Japan (206) (Sarkissian and Schill, 2004). Most of the British companies are cross-listed in the United States. Third, although United Kingdom is considered to have well developed corporate governance system, cross-listing by British firms can have an impact on insider trading. There is a large group of British firms that list in the United States, and according to La Porta et al. (2005), the United States have higher indices of regulations of securities markets, including disclosure requirements, liability standard, criminal sanctions and public enforcement than the United Kingdom. Wojcik, Clark and Bauer (2004) confirm that British firms with listing in the United States have marginally higher corporate governance ratings than companies listed domestically only. Baker et al. (2002) show that the US market provides higher firm's visibility

than the British market and listing on the New York Stock Exchange (NYSE) is associated with improved information environment. Moreover, Lang et al. (2003, 2004) report that international cross-listing has surprisingly the largest impact on firms' information environment in developed markets that choose to list in the US with the lowest level of disclosure requirements (private placement Rule 144a ADRs and OTC-listed ADRs (Level I)). Such companies account for 40% of cross-listed companies in our sample.

2.2. Data and Sample Selection

2.2.1. Insider Trading

We use a large database of directors' dealings spanning January 1999 and December 2003 and hand collected information on cross-listings in the United States by British companies. The database of directors' dealings is provided by Directors Deals Ltd. and includes news items on directors' trades disclosed by all British companies to the Regulatory News Service (RNS). The following information is given for each transaction: company name and SEDOL number, date of transaction and date of public announcement, type of transaction, number of securities traded, class of securities (ordinary, preference etc.) and industry sector of company. Under the 1985 Companies' Act and the Continuing Obligations Section of the London Stock Exchange Rules (Yellow Book), companies listed on the LSE are required to report any directors' trade in their own firms' securities. In the United Kingdom, the company directors are the insiders obliged to disclose their trades.¹ The disclosure requirements specify that directors must inform their company without delay about any transaction carried out personally, no later than

on the fifth business day after the trading date. Subsequently the company must inform the stock exchange by the end of the following business day and also enter this transaction in the Company Register. The information on insider trading is disseminated by stock exchange via online 'Regulatory News Service' immediately (Friederich et al., 2002). Given this legal requirement, we separately analyse abnormal returns around trading dates and announcement dates. We also analyse the effect of the lag between trading date and announcement date.

In line with previous studies, a number of insider trading observations that are not likely to convey private information are excluded.² The following types of transactions are eliminated: transactions involving insiders exercising their options or derivatives, script dividends or bonus shares, rights issue, awards made to directors under incentive plans or reinvestment plans, gifts, transfers and purchase and sales of shares under personal equity plans, operations derived from tax or 'bed & breakfast' purposes, resignation from position, and any other transaction that are not driven by privileged information. In addition, we exclude all directors' transactions in investment companies. The screening resulted in 13,535 insider trades in 928 listed companies, over the five-year period, split into 10,541 (78%) purchases and 2,994 (22%) sells.³ Our sample period is limited to five years because of data availability.

¹ Corporate insider definition is narrower in the British law, than in the US where corporate insider definition includes officers, directors and shareholders of at least 10% of any equity class.

² See for example, Jaffe (1974); Finnerty (1976a, 1976b); Pope, Morris and Peel (1990); Gregory, Matatko, Tonks and Purkis (1994); Gregory et al. (1997), Friederich et al. (2002), and Hillier and Marshall (2002).

³ We find a number of days with more than one transaction or announcement of transaction in shares of the same company. Sometimes a few transactions made on different days are reported in one announcement. Overall, our sample size is larger than any other recent insider trading study on British data. Gregory et al. (1997) use 6,756 transactions for 1,683 companies between January 1986 and December 1990, Friederich et al. (2002) use 4,399 transaction for 196 companies between October

Nevertheless, it covers two main interesting sub-periods: the worldwide boom (January 1999 to March 2000) and burst (April 2000 to December 2003) in stock markets.

2.2.2. *International Cross-Listing*

We hand collect data on US cross-listings by British companies from Amex, Nasdaq and NYSE stock exchanges, Bank of New York and JP Morgan. Sarkissian and Schill (2004) provide country-to-country frequency distribution of foreign listings among major world stock exchanges as of 1998. This information serves as a starting point in our investigation. We enter each stock exchange's web site and look for a list of foreign companies listed currently and in the past, and for the date of the first listing. However, in the case where the company is delisted, we were unable to obtain full data on the first and last dates of listings. For missing dates of first listings, we searched Factiva database. Additionally we searched Bank of New York and JP Morgan Depository Receipts databases for OTC listed American Depository Receipts (ADRs) (Level I) and private placement Rule 144A. Except for the NYSE, stock exchanges do not provide information on foreign listings in the past.⁴ Therefore we were unable to find out a complete list of British companies delisted from Nasdaq before the end of our sample period. The information on foreign cross-listings was finally verified with British corporations' web pages and checked for errors.

After selecting all British companies cross-listed in the United States on Amex, Nasdaq, and NYSE, or over the counter (OTC), or as private placements, we find insider trading was reported for 115 companies. Forty six of those companies are cross-

1986 and December 1994, and Hillier and Marshall (2002) use 7,796 transaction for 1,350 companies between September 1991 and March 1997.

⁴ Our sample is biased toward more recent ADRs programs because Bank of New York and JP Morgan provide information on the most recent programs only.

listed on NYSE, 21 on Nasdaq and one on Amex and 48 companies use OTC-listed ADRs (Level I).⁵ In our sample we do not have ADRs that involve only Rule 144a Private Placement. Consequently, the majority of those companies are subject to stricter corporate governance system than at home. In the last step of sample selection process, all insider trading observations are classified into two groups: observations recorded for cross-listed companies and observations for domestically listed companies. 2,400 announcements of insider trades are dedicated to cross-listed companies and 11,135 to domestically listed companies.

2.3. Methodology

2.3.1. Event Study

To investigate the stock price reaction to insider trading a standard event study approach based on market model is applied. The market model parameters α and β are estimated for every stock on the basis of daily log stock returns during 180-day estimation window, [-220, -41] days relative to the event day. We calculate return on the market using the FTSE All share index. This index is the most appropriate proxy for market portfolio because it covers about 800 British listed companies. The daily stock prices and FTSE All share index are obtained from Perfect Analysis. The stock prices are adjusted for splits and dividends. Abnormal returns are calculated over [-40, +40] event window as:

$$AR_{it} = R_{it} - (\alpha_i + \beta_i R_{mt}) \quad (2.1)$$

⁵ Some of the cross-listed companies use two ways to list their ADRs, for instance over the counter and stock exchange. In such a case we consider such a company as listed on the stock exchange because it implies stricter disclosure requirements.

where AR_{it} is company i 's abnormal return on day t . R_{it} and R_{im} denote day t stock return on company i and market, respectively. We check the robustness of our results by using market adjusted and mean adjusted models to calculate the abnormal stock returns.

Abnormal returns on each day are averaged and then cumulated over time in the following way:

$$AAR_t = \frac{1}{N} \sum_{i=1}^N AR_{it} \quad (2.2)$$

$$CAAR(t_1, t_2) = \sum_{t_1}^{t_2} AAR_t \quad (2.3)$$

AAR_t and $CAAR(t_1, t_2)$ are average abnormal returns for the day t and cumulative average abnormal returns over the event window t_1 to t_2 , respectively. We use t-statistics that accounts for cross-sectional dependence to test for statistical significance of abnormal performance (Brown and Warner, 1985). Over a multi-day interval t-statistics is calculated as:

$$t - stat = \frac{CAAR(t_1, t_2)}{\sqrt{(t_2 - t_1 + 1) \mathbf{s}_{AAR_{EW}}}} \quad (2.4)$$

where,

$$\mathbf{s}_{AAR_{EW}} = \sqrt{\left(\sum_{-220}^{-41} (AAR_t - \overline{AAR})^2 \right) / 179} \quad (2.5)$$

$s_{AAR_{EW}}$ is the standard deviation of the AAR_t over the estimation window (EW) and \overline{AAR} is the average of the AAR during the estimation window.

We define two event dates. The first is the day the insider transaction is released to the RNS and the second is the day the insider transaction was actually executed. These two dates allow us to overcome any inconsistencies documented in previous studies (e.g., Friederich et al., 2002, Lasfer, 2004).

2.3.2. Cross-Sectional Regression Analysis

We test for the determinants of the abnormal performance by running a set of regressions against insider trading variables adopted from previous literature.

$$\begin{aligned} CAR_i = & \mathbf{a} + \mathbf{b}_1 CrossListing_i + \mathbf{b}_2 Shares Traded_i \\ & + \mathbf{b}_3 Multiple Trading per Day_i \\ & + \mathbf{b}_4 Multiple Trading in 30 Days_i + \mathbf{e}_i \end{aligned} \quad (2.6)$$

$$\begin{aligned} CAR_i = & \mathbf{a} + \mathbf{b}_1 OTC Listing_i + \mathbf{b}_2 Amex / Nasdaq / NYSE_i \\ & + \mathbf{b}_3 Shares Traded_i + \mathbf{b}_4 Multiple Trading per Day_i \\ & + \mathbf{b}_5 Multiple Trading in 30 Days_i + \mathbf{e}_i \end{aligned} \quad (2.7)$$

The dependent variable in both models is the cumulative abnormal returns (CAR) over three [-1, +1] and 39 [+2, +40] days around the event day. In the base model (2.6) we use a dummy variable equals to one if the firm is cross-listed (*CrossListing*) to capture the cross-listing effect. The theoretical literature has not provided a clear explanation of how insiders trade on private information. The existing literature suggests that larger trades convey more information and have greater market impact (Easley and O'Hara, 1987). To test whether the size of trades affects

the price we use the number of shares traded by insiders scaled by the number of shares outstanding at the end of financial year (*Shares Traded*). In line with the theoretical literature, the frequency of insider trading serves as a good proxy for informed trading and signaling because the insiders can split up their trades to mislead uninformed traders (Kyle, 1985; Easley and O'Hara, 1987; Laffont and Maskin, 1990). We measure insider trading frequency within one day and within 30 calendar days. *Multiple Trading per Day* is a dummy variable that equals one if more than one insider trades are reported in the same company on the same day. *Multiple Trading in 30 Days* is a dummy variable that equals one if more than one insider trades are reported in the same company within 30 calendar days. It reflects either several corporate insiders trading within a short period of time or the same insider splitting up her trades over a period of time. We have no data on identity of insiders; therefore we are unable to address the issue in greater detail. However, it is reasonable to assume that both cases magnify the market impact of trades. In model (2.7) we replace dummy for cross-listing by a set of dummies that correspond to the level of cross-listing and the level of disclosure requirements imposed by Security and Exchange Commission (SEC). *OTC Listing*, and *Amex/ Nasdaq/ NYSE* are dummy variables and equal one if insider trading event occurs when a firm's ADRs involve OTC listing (Level I), or listing on one of the three stock exchanges, respectively and zero otherwise.

2.3.3. *Testing for Endogeneity*

It may be inappropriate to conclude about the influence of cross-listing on profitability of insider trading without controlling for selection bias. Market response to insider trading in cross-listed companies can be influenced by changes in the legal

and disclosure environment. Nevertheless, the decision to cross-list may be influenced by firms' fundamental characteristics and hence our cross-listing dummy variables may not be exogenous. Previous findings suggest that cross-listed firms tend to be larger and faster growing in terms of sales and profit than a typical peer company listed domestically (Reese and Weisbach, 2002; Doidge et al., 2004). The cross-listed companies are not random, thus Ordinary Least Square (OLS) estimators of cross-listing may be biased. To control for potential selectivity bias we use two-stage Heckman-type procedure (Heckman, 1979) applied also by Doidge et al. (2004).

The set of regression models is:

$$CAR_i = \mathbf{a} + \mathbf{B}' \underline{X}_i + \mathbf{d}CrossListing_i + \mathbf{e}_i \quad (2.8)$$

$$CrossListing_i^* = \mathbf{g}' \underline{W}_i + \mathbf{x}_i \quad (2.9)$$

Assumptions:

$$\mathbf{e}_i \text{ are } N(0, \mathbf{s}^2)$$

$$corr(\mathbf{e}_i, \mathbf{x}_i) = \mathbf{r}$$

where CAR_i represents CARs, \underline{X}_i are exogenous independent variables used to explain CAR_i , and $CrossListing_i$ is a dummy variable that equals one for cross-listed companies, and zero, otherwise. The estimated parameter \mathbf{d} measures the association between cross-listing and CAR . \underline{W}_i represents a set of determinants that can potentially influence the decision to cross-list. The decision to cross-list is made according to the following rule:

$$CrossListing_i = \begin{cases} 1, & \text{if } CrossListing_i^* > 0 \\ 0, & \text{if } CrossListing_i^* \leq 0 \end{cases} \quad (2.10)$$

The variable $CrossListing_i$ is assumed to result from an unobservable variable $CrossListing_i^*$. The correlation between $CrossListing_i^*$ and e_i is nonzero if \underline{W}_i , the set of exogenous variables in the model (2.9), affects CAR_i , but are not in model (2.10), or if the residuals, e_i and x_i , are correlated. Equations (2.8) and (2.9) are estimated using the Heckman (1979) approach. Under the above assumptions, the expected value of CAR_i for a cross-listed company is:

$$E(CAR_i | CrossListing_i = 1) = \mathbf{a} + \underline{B}' \underline{X}_i + \mathbf{d} + \mathbf{r} \mathbf{s}_e \mathbf{I}_{i1}(\underline{g}' \underline{W}_i) \quad (2.11)$$

$$\mathbf{I}_{i1}(\underline{g}' \underline{W}_i) = \mathbf{f}(\underline{g}' \underline{W}_i) / \Phi(\underline{g}' \underline{W}_i) \quad (2.12)$$

where $\mathbf{I}_{i1}(\underline{g}' \underline{W}_i)$ is the 'inverse Mills' ratio', $\mathbf{f}(\cdot)$ and $\Phi(\cdot)$ are the density functions and cumulative distribution functions for the standard normal, respectively. The expected value of CAR_i for a domestically listed company is:

$$E(CAR_i | CrossListing_i = 0) = \mathbf{a} + \underline{B}' \underline{X}_i + \mathbf{r} \mathbf{s}_e \mathbf{I}_{i2}(\underline{g}' \underline{W}_i) \quad (2.13)$$

$$\mathbf{I}_{i2}(\underline{g}' \underline{W}_i) = -\mathbf{f}(\underline{g}' \underline{W}_i) / [1 - \Phi(\underline{g}' \underline{W}_i)] \quad (2.14)$$

The difference in the abnormal returns (CAR) gained by insiders in cross-listed and domestically listed companies is:

$$E(CAR_i | CrossListing_i = 1) - E(CAR_i | CrossListing_i = 0) = \mathbf{d} + rs_e \mathbf{f}(\mathbf{g}' \underline{W}_i) / [\Phi(\mathbf{g}' \underline{W}_i)(1 - \Phi(\mathbf{g}' \underline{W}_i))] \quad (2.15)$$

Model (2.15) presents the direction of the potential bias in the OLS estimator for \mathbf{d} in the model (2.8) because it depends on the sign of the correlation of the error terms \mathbf{r} . If the correlation is negative, as hypothesized for buys in cross-listed firms then \mathbf{d} is biased downward. If the correlation is positive, as hypothesized for sells in cross-listed firms then \mathbf{d} is biased upward. In the first step the Heckman procedure estimates \mathbf{g} using a logit model. Next, these consistent estimates are used to calculate \mathbf{I}_{i1} and \mathbf{I}_{i2} . In the second step, the procedure estimates model (2.8) using OLS with additional term \mathbf{I}_i , to correct for the selection bias.

$$\mathbf{I}_i = \mathbf{I}_{i1}(\mathbf{g}' \underline{W}_i) CrossListing_i + \mathbf{I}_{i2}(\mathbf{g}' \underline{W}_i)(1 - CrossListing_i) \quad (2.16)$$

$$CAR_i = \mathbf{a} + \underline{B}' \underline{X}_i + \mathbf{d} CrossListing_i + \mathbf{d}_1 \mathbf{I}_i + \mathbf{n}_i \quad (2.17)$$

Parameter \mathbf{d}_1 is associated with rs_e and captures the sign of the correlation between the residuals in models (2.8) and (2.9)⁶.

2.4. Empirical Results

2.4.1. Descriptive Statistics

Table 2.1 presents the descriptive statistics of the sample. The average size of insider trading, measured by the ratio of shares traded to shares outstanding,

⁶ See Greene, 2003.

Table 2.1. Descriptive Statistics

	All Companies		Cross-Listed Companies		Domestically Listed Companies		t-test difference in means (3)-(5)	Kruskal - Wallis Test for differences in median Chi-Square (4)-(6)
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A Insider Trading (All Observations)								
Shares Traded	0.0014	0.0001	0.0003	4.2×10^{-6}	0.0016	0.0002	8.44 ^{***}	2,861.82 ^{***}
Trades per Day	2.2685	1.0000	2.7334	2.0000	2.1690	1.0000	-11.38 ^{***}	103.99 ^{***}
Observations	13,287	13,287	2,344	2,344	10,943	10,943		
Panel B Fundamentals (Firm - Years)								
Market Cap (£m)	2,108.00	166.09	12,392.92	4,437.51	574.06	128.39	-8.53 ^{***}	673.11 ^{***}
Total Assets (£m)	5,973.53	879.34	31,485.58	5,001.22	2,168.54	800.62	-6.80 ^{***}	497.49 ^{***}
Total Sales (£m)	1,324.39	119.70	7,145.94	2,219.00	453.20	91.80	-6.64 ^{***}	361.54 ^{***}
M/B	3.93	1.64	10.47	2.17	2.96	1.56	-1.10	33.67 ^{***}
Debt	0.0991	0.0425	0.2206	0.1933	0.0809	0.0306	-15.58 ^{***}	322.51 ^{***}
Firm-Years	3,159	3,159	410	410	2,749	2,749		

This table presents descriptive statistics of UK listed companies in our sample. The observations are classified by listing type/exchange. OTC Listing denotes OTC listed ADRs (Level I), Rule 144A Private Placement denotes private placement Rule 144A ADRs, Amex/ NASDAQ/ NYSE denote listing of ADRs on one of the three stock exchanges. Shares Traded is a ratio of a number of shares traded by an insider to the number of shares outstanding at the end of the year. Trades per Day is a number of insider trades reported on the same day. Market Capitalisation, Total Assets, Total Sales and Debt are calculated as at the end of financial year. Debt represents total debt to total assets. ^{***}, ^{**}, ^{*} denote significance at the 0.01, 0.05 and 0.1 level, respectively.

is 0.0014 for the full sample. The average ratio of shares traded in cross-listed companies is statistically lower than in domestically listed (t-stat=8.44) and equals 0.0003, and 0.0016 respectively. We find that there are on average more than two trades reported on the same day but the ratio is statistically higher for cross-listed companies; 2.7334 compared with 2.1690. These results suggest that either more than one insider trade on the same day or the same insider split her orders in order to mask her trades. Both cases indicate however that insider may trade on private information.

Overall, insider trading characteristics show differences between cross-listed and domestically listed companies.

The companies' fundamental characteristics reported in Table 2.1, Panel B also confirm significant differences between companies listed abroad and only domestically. Cross-listed companies are larger in terms of size, have higher growth opportunities and higher leverage. T-test for differences in means, and Kruskal-Wallis test for differences in median show statistical differences between the two groups of companies. Only the difference in means of growth opportunities is insignificant which is due to large standard deviation. We use three proxies for size, market capitalization, total assets and total sales. Market to book ratio serves as a measure of growth opportunities and total debt to total assets as a proxy for debt.

These apparent differences between cross-listed and domestically listed companies indicate a selection bias problem and deserve more attention. We address this issue in greater detail section 2.4.6 and 2.4.7 to control the influence of selection bias on our results and inferences.

2.4.2. Abnormal Returns

Table 2.2, Panel A, reports a summary of the behaviour of share prices around insider trading announcement for the sample as a whole and for the two groups of firms. The results indicate that on the event dates [-1, +1] share prices for buy transactions increase significantly for domestically listed companies. The cumulative average abnormal return (CAAR) of 0.2% for cross-listed firms on foreign market is statistically lower than the 1.5% CAAR for domestically listed companies (t-statistic of differences in means is 7.15). The CAAR for sell transactions on the event dates [-1, +1] of -0.5%

Table 2.2. Cumulative Average Abnormal Returns over the (-40, +40) Event Window for the Full Sample

	All Companies	Cross-Listed Companies	Domestically Listed Companies	t-test differences in mean (2)-(3)
	(1)	(2)	(3)	(4)
Panel A Announcement Day				
<i>Number of Observations</i>				
Buy	10,541	1,966	8,575	
Sell	2,994	434	2,560	
<i>CARs (-1, +1)</i>				
Buy	0.013***	0.002	0.015***	7.15***
Sell	-0.005***	-0.003	-0.005***	-0.70
<i>CARs (-40, -2)</i>				
Buy	-0.048***	-0.050***	-0.047***	0.52
Sell	0.056***	0.046***	0.058***	1.36
<i>CARs (+2, +40)</i>				
Buy	0.046***	0.030***	0.049***	4.14***
Sell	-0.030***	0.002	-0.036***	-3.74***
Panel B Trading Day				
<i>Number of Observations</i>				
Buy	10,540	1,966	8,574	
Sell	2,989	433	2,556	
<i>CARs (-1, +1)</i>				
Buy	0.007***	-0.002	0.009***	4.91***
Sell	0.001	0.005*	0.000	-2.06**
<i>CARs (-40, -2)</i>				
Buy	-0.046***	-0.049***	-0.045***	0.85
Sell	0.056***	0.042***	0.059***	1.86*
<i>CARs (+2, +40)</i>				
Buy	0.047***	0.028***	0.052***	5.36***
Sell	-0.032***	-0.002	-0.037***	-3.51***

The table presents cumulative average abnormal returns around insider trading events computed using event study methodology. Market model coefficients α and β are estimated over days -220 to -41 relative to the event, with FTSE All Share Index as the proxy for market portfolio. The full sample includes all insider trading observations. All results are reported relative to insider trading announcement day (date of the public announcement of insider trading) and trading day (date of insider trading transaction). Cross-listed companies are UK companies listed in the US. Domestically listed companies are UK companies listed in the UK, excluding those cross-listed in the US. ***, **, * denote significance at the 0.01, 0.05 and 0.1 level, respectively.

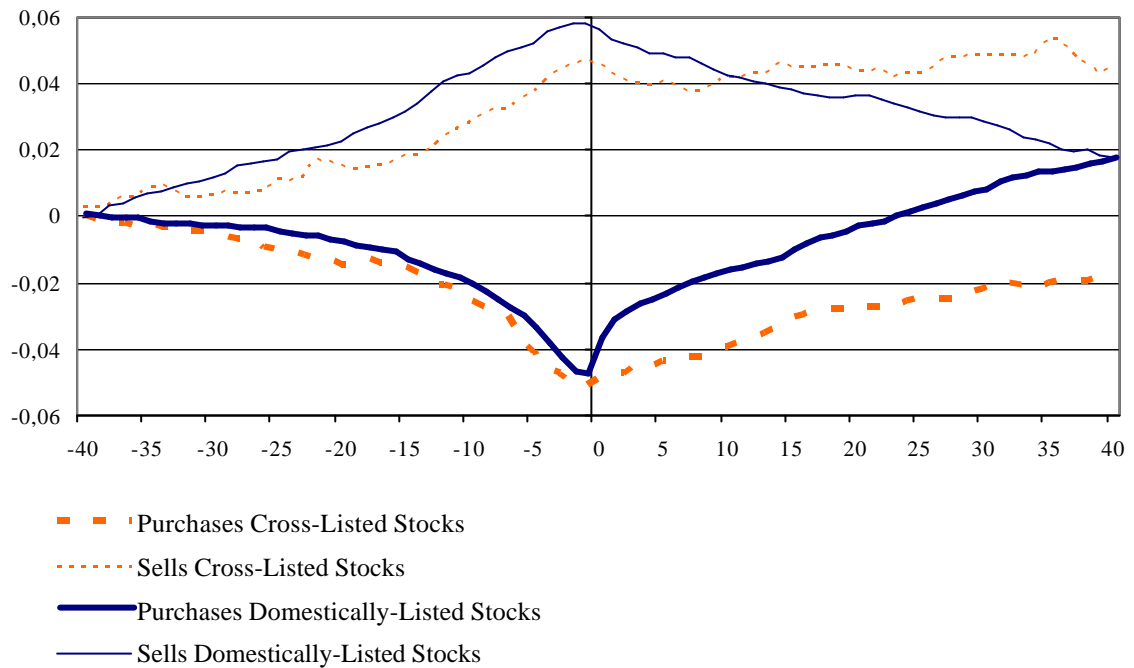


Figure 2.1. Cumulative Abnormal Returns around Insider Trading Announcement

The Figure presents cumulative average abnormal returns around insider trading events [-40, +40] computed using event study methodology. Market model coefficients α and β are estimated over days -220 to -41 relative to the event, with FTSE All Share Index as the proxy for market portfolio. All results are reported relative to insider trading announcement day (date of the public announcement of insider trading). Cross-listed companies are UK companies listed in the US. Domestically listed companies are UK companies listed in the UK, excluding those cross-listed in the US

for domestically listed companies are also significant. In contrast, for the cross-listed companies the abnormal returns of -0.3% are not statistically significant, but not significantly different from the CAAR of domestically-listed companies ($t = -0.70$). As documented in previous studies (e.g., Hillier and Marshall, 2002) sells are likely to be executed for different reasons than buys, and therefore may provide ambiguous signals for the market. The studies tend to find much stronger reaction to purchases than to sells. Interestingly, the magnitude of the stock price reaction to both types of transactions is similar in case of cross-listed companies. It provides further evidence that information conveyed by directors of cross-listed companies is relatively weak and we do not observe the buy-sell asymmetry. On the other hand,

findings for full sample and domestically quoted stocks are in line with trends observed in other studies (Friederich et al., 2002; Hillier and Marshall, 2002).

The differences in patterns of abnormal returns and the differences in means between the CAARs of the same transaction type over the full event window [-40, +40] presented in the Table 2.2 and in Figure 2.1 suggest that the insider transactions are driven by different motives and convey different amount of price sensitive information. The general pattern in the Figure 2.1 shows that directors purchase shares in their own company after a period of poor performance and sell after a period of good performance. The negative trend before purchases leads to highly significant negative abnormal returns. Prior to the buy transactions the abnormal returns on shares in internationally cross-listed firms underperform market, on average, to a larger extent than in domestically listed firms. The abnormal returns over the pre-event period [-40, -2] decrease significantly by 5.0% and by 4.7% for the cross-listed and domestically listed companies, respectively. This suggests that directors of cross-listed companies tend to wait with share purchase in their company for lower stock price than directors of domestically listed companies.

Prior to sell transactions the abnormal returns are consistently positive. Over the same pre-event period [-40, -2] the abnormal returns for sell transactions increase significantly by 4.6% in the companies cross-listed on foreign markets and by 5.8% in the companies listed domestically. Unlike the buy transactions, directors in domestically listed companies wait longer with sell transactions, until the abnormal return on their companies' shares reach the highest possible level. Abnormal returns of domestically listed stocks outperform the market before sells trades to a larger extent than abnormal returns of cross-listed stocks.

The post-event [+2, +40] abnormal returns behaviour is of particular interest in explaining the observed differences in insider trading between groups of companies listed in the United States and domestically. Subsequent to the insider trading announcement the buy and sell trends revert. We observe greater speed and scale of the market reaction to insiders' buy trades in a group of domestically listed companies than US cross-listed. Buy trades are followed by positive and statistically significant returns of 3.0% for cross-listed companies and of 4.9% for domestically listed companies. These results may imply that directors in domestically listed companies reveal more price sensitive information in their trades than directors in companies cross-listed in the United States.

The post-event abnormal returns behaviour after the sell transactions is considerably different for cross-listed than for domestically listed companies. In case of companies listed abroad, the cumulative abnormal returns move insignificantly around the value from the announcement day. This may suggest that these sell trades do not convey any significant information to the market. In case of domestically listed companies, subsequent to the sell transactions the abnormal returns significantly decrease over the post-event period by 3.6%. This result comply that directors of domestically listed companies time their transactions and their sell trades convey price sensitive information.

We observe reduced information asymmetry between cross-listed companies and their investors. US cross-listing improves firm's visibility and reduces information asymmetries between insiders and outsiders due to increased disclosure requirements, larger analyst following and media attention (Baker et al., 2002; Lang et al., 2003, 2004), higher US corporate governance standards and more efficient legal system than in the United Kingdom (Cofee, 1999; Stulz, 1999; La Porta et al. 1998). Directors

from companies cross-listed in the United States may avoid trading on private information to protect themselves from more severe legal consequences. Overall, the results support our hypothesis suggesting that, on average, the information content of insider trading is lower in cross-listed than in domestically listed companies. The findings however, are not strong enough to fully support the bonding hypothesis, which predicts that insiders from a company cross-listed in a foreign market with better corporate governance standards would avoid trading on confidential information to protect themselves from more severe legal consequences.

2.4.3. Confounding Events

Confounding events cause potential limitation of the investigation because the clustering events may drive the abnormal returns. This problem appears when cross-sectional correlation is present in the sample and the standard errors are not properly estimated. This difficulty can be circumvented by using daily data, diversifying sample across industry sectors and accounting for the cross-sectional dependence in the t-statistics used to test for statistical significance of abnormal performance. Although we comply with these requirements, in the next step we exclude from our sample all insider trades that occurred within the first five trading dates after the preceding trade in the same company. Similarly to Del Brio, Miguel and Perote (2002) we expect the abnormal returns after excluding the confounding events to be lower than in case of full sample, because single trades have lower magnitude than multiple.

Table 2.3, Panel A reports the results. The number of buy and sell trades observations decrease by about 45% and 32%, respectively. The abnormal returns

Table 2.3. Cumulative Average Abnormal Returns over the (-40, +40) Event Window for the Sample Excluding Confounding Events

	All Companies	Cross-Listed Companies	Domestically Listed Companies	t-test differences in mean (2)-(3)
	(1)	(2)	(3)	(4)
Panel A Announcement Day				
<i>Number of Observations</i>				
Buy	5,893	974	4,919	
Sell	2,036	282	1,754	
<i>CARs (-1, +1)</i>				
Buy	0.010***	0.001	0.012***	4.92***
Sell	-0.004***	-0.001	-0.004***	-1.21
<i>CARs (-40, -2)</i>				
Buy	-0.028***	-0.034***	-0.027***	0.97
Sell	0.047***	0.039***	0.048***	0.88
<i>CARs (+2, +40)</i>				
Buy	0.039***	0.023***	0.043***	3.25***
Sell	-0.029***	-0.007	-0.032***	-2.50**
Panel B Trading Day				
<i>Number of Observations</i>				
Buy	5874	983	4,891	
Sell	2039	281	1,758	
<i>CARs (-1, +1)</i>				
Buy	0.005***	-0.001	0.006***	2.63***
Sell	0.002	0.008***	0.001	-2.16**
<i>CARs (-40, -2)</i>				
Buy	-0.028***	-0.034***	-0.027***	0.96
Sell	0.049***	0.039***	0.050***	1.05
<i>CARs (+2, +40)</i>				
Buy	0.041***	0.021***	0.046***	4.17***
Sell	-0.029***	-0.007	-0.033***	-2.33**

The table presents cumulative average abnormal returns around insider trading event computed using event study methodology. Market model coefficients α and β are estimated over days -220 to -41 relative to the event, with FTSE All Share Index as the proxy for market portfolio. The sample excludes insider trades that occurred within the first five trading days after the preceding trade in the same company. All results are reported relative to insider trading announcement day (date of the public announcement of insider trading) and trading day (date of insider trading transaction). All companies are all companies from our sample. Domestically listed companies are UK companies listed in the UK, excluding those cross-listed in the US. Domestically listed companies are UK companies listed only in the UK. ***, **, * denote significance at the 0.01, 0.05 and 0.1 level, respectively.

for the sample of cross-listed companies are smaller in value yet still insignificant on the event dates $[-1, +1]$. These findings may further comply that the insider trades in companies listed abroad are not driven entirely by private information. The abnormal returns for the sample of domestically listed companies are also smaller in value and their statistical significance remains unchanged at the 0.01 level. The t-test in the last column confirms the statistical difference between abnormal returns of buy transactions over the event dates $[-1, +1]$ at the 0.01 level, and of buy and sell transactions over the post-event period $[+2, +40]$ at the 0.01 and 0.05 level, respectively. Exclusion of confounding transactions does not alter our results, and support our general finding that insider trades executed in domestically listed companies convey more price sensitive information than those executed by directors of cross-listed companies.

2.4.4. Announcement Day vs. Trading Day

We follow the discussion in literature and examine empirically whether the information on the insider trade reaches the market and triggers price reaction on the day of the trade or on the announcement day (Friederich et al., 2002; Lasfer, 2004). The issue does not exist when the trade and the announcement happen to be on the same day. However, in our sample the information about insider trading is released, on average, on the fourth day after the trade was carried out. The median shows that the announcement follows insider transaction on the next day. Therefore, we expect the results on the event date $[-1, +1]$ to be weaker than those investigated on the announcement day. Table 2.2, Panel B and Table 2.3, Panel B report summary of the share prices behaviour around insider trading day in group of cross-listed

Tabela 2.4. Difference between Announcement Day and Trading Day

	All Companies	Cross-Listed Companies	Domestically Listed Companies	t-test differences in mean (2)-(3)
	(1)	(2)	(3)	(4)
Announcement Day = Trading Day				
<i>Panel A CAARs calculated for Trading Day</i>				
<i>Number of Observations</i>				
Buy	2,689	447	2,242	
Sell	598	63	535	
<i>CARs (-1, +1)</i>				
Buy	0.012***	-0.004	0.015***	3.70***
Sell	0.001	0.008	0.000	-1.50
<i>CARs (-40, -2)</i>				
Buy	-0.049***	-0.068***	-0.045***	1.73*
Sell	0.067***	0.051**	0.068***	0.81
<i>CARs (+2, +40)</i>				
Buy	0.058***	0.046***	0.061***	1.79*
Sell	-0.019**	0.024	-0.024**	-3.16***
Announcement Day > Trading Day				
<i>Panel B CAARs calculated for Trading Day</i>				
<i>Number of Observations</i>				
Buy	7,851	1,519	6,332	
Sell	2,391	370	2,021	
<i>CARs (-1, +1)</i>				
Buy	0.005***	-0.001	0.007***	3.31***
Sell	0.001	0.005	0.000	-1.67*
<i>CARs (-40, -2)</i>				
Buy	-0.044***	-0.044***	-0.045***	-0.10
Sell	0.054***	0.041***	0.056***	1.58
<i>CARs (+2, +40)</i>				
Buy	0.043***	0.023***	0.048***	4.98***
Sell	-0.035***	-0.007	-0.040***	-2.96***
<i>Panel C CAARs calculated for Announcement Day</i>				
<i>Number of Observations</i>				
Buy	7,852	1,519	6,333	
Sell	2,396	371	2,025	
<i>CARs (-1, +1)</i>				
Buy	0.013***	0.004**	0.016***	6.28***
Sell	-0.006***	-0.005*	-0.006***	-0.40
<i>CARs (-40, -2)</i>				
Buy	-0.047***	-0.045***	-0.048***	-0.46
Sell	0.054***	0.045***	0.055***	1.04
<i>CARs (+2, +40)</i>				
Buy	0.041***	0.027***	0.045***	3.60***
Sell	-0.033***	-0.002	-0.039***	-3.17***

This table presents analysis of results when announcement day is equal to insider trading day, and when announcement day is greater than insider trading day. The cumulative average abnormal returns around insider trading event are computed using market model event study methodology. Market model coefficients α and β are estimated over days -220 to -41 relative to the event, with FTSE All Share Index as the proxy for market portfolio. The full sample includes all insider trading observations. All results are

reported relative to insider trading announcement day (date of the public announcement of insider trading) and trading day (date of insider trading transaction). Cross-listed companies are UK companies listed internationally. Domestically listed companies are UK companies listed only in the UK. ***, **, * denote significance at the 0.01, 0.05 and 0.1 level, respectively.

and group of domestically listed companies. The results for purchases are in line with our expectation. Abnormal returns for cross-listed firms are insignificant and for domestically listed are smaller in value. 0.9% and 0.6% for the trading compared with 1.5% and 1.2% for the announcement. The findings for sell transactions of stocks listed abroad are ambiguous. Abnormal returns for sell of cross-listed companies become significant and abnormal returns of domestically listed stocks lose their significance.

More detailed analysis is presented in Table 2.4. We compare the trading dates with announcement dates for each observation and separate those with equal dates. Then we calculate the abnormal returns for the two subsamples in a group of internationally cross-listed and a group of domestically listed companies. Table 2.4, Panel A presents the results for the observations with equal trading and announcement dates. Table 2.4, Panel B and C present the findings for announcements released at least one day after the trade. These results corroborate that there is a significant difference between information content of insider trade and its announcement. Abnormal returns in the window $[-1, +1]$ around the trade are generally insignificant. In this case, we do not capture the day when the information about insider trading hits the market if the announcement is on average on the fourth day after the date of trade and we have three-day event window. Results of this analysis confirm that the information on insider trading reaches the market on the day of its announcement not the day of trade execution. Making an assumption that the market recognizes directors' deals when they are executed may be inappropriate.

2.4.5. Alternative Event Study Methodologies

To check the robustness of our results we use different event studies methodologies to compute abnormal stock returns. In addition to market model we test market adjusted model and mean adjusted model. The results are not sensitive to the methodology used for buy transactions in both analysed groups of companies. Abnormal returns for sell transactions in internationally cross-listed companies lose their significance in the event period $[-1, +1]$ and remain significantly positive prior to the event, and insignificant subsequent to the event. Abnormal returns for sell transactions do not alter with methodology applied in group of domestically listed companies over the event dates $[-1, +1]$. They are however, sensitive in the pre- and post-event period. The same type of robustness check was applied for the sample excluding confounding events. The obtained results are similar.

2.4.6. Control Sample

Since our results on informativeness of insider trading may be driven by the fact that cross-listed companies are usually larger than domestically listed companies, we attempt to construct a control sample matching the companies according to size. The main problem we face is that cross-listed companies are mostly large and we are unable to find suitable counterparts among companies listed domestically. Nevertheless, we include in the control sample the largest companies and proceed with event study for this control sample. The results are similar to the results obtained for the full sample. These findings may suggest that our assumption is correct yet more complex regression analysis that controls for fundamental factors affecting information asymmetry is required.

2.4.7. Cross-Sectional Regression Analysis and the Endogeneity

Panel A of Table 2.5 presents the results of cross-sectional regressions to explain the factors determining price reaction to insider sales and purchases. Cross-listing effect is captured by a dummy variable, and control variables include the characteristics of insider trading.

After controlling for other variables in Ordinary Least Squares regressions, we find that our previous results are confirmed. Abnormal returns in the event window [-1; +1] in cross-listed companies are lower in absolute values for both sells and purchases. However, the results for sells are statistically insignificant. In the post event window, the effects are statistically significant independent of the transaction type. Variables controlling for the frequency of the transactions, reflecting possible splitting orders or different insiders trading within a short time period are statistically significant. In these cases the information content of trades is magnified. The effect of the transaction size is ambiguous. Larger transactions apparently have larger pricing impact for purchases but smaller impact for sells.

The comparison of characteristics of cross-listed and domestically listed companies reveals that decision to cross-list may be endogenously determined (Table 2.1). Cross-listed companies are definitely larger in terms of market capitalization, total assets and sales. This finding is confirmed in the first step of Heckman-type analysis. Additionally, debt and market to book ratios appear to be significant determinants of cross-listing decision. The results of logistic regression are presented in Panel I of Table 2.6. The estimated probabilities from logistic regression are then included in cross-sectional regressions presented in Table 2.6, Panel II. The selectivity bias is found to influence the results. In short window around the insider trading events

Tabela 2.5. Cross-Sectional Regressions of Cumulative Abnormal Returns around Insider Trading Announcement and Trading Day – OLS Analysis

		Constant	Cross-Listing	OTC Listing	Amex/NASDAQ/NYSE	Shares Traded	Multiple Trading per Day	Multiple Trading 30 Days	N	Adj. R2
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<i>Panel A Announcement Day</i>										
<i>CAR (-1, +1)</i>										
Model 1	Buy	0.0099 (0.0000)	-0.0129 (0.0000)			1.5400 (0.0000)	0.0065 (0.0003)	0.0034 (0.0837)	10,348	0.0092
	Sell	-0.0039 (0.0079)	0.0023 (0.4272)			0.2102 (0.0083)	-0.0052 (0.0115)	-0.0009 (0.7340)	2,939	0.0032
Model 2	Buy	0.0099 (0.0000)		-0.0135 (0.0001)	-0.0126 (0.0000)	1.5402 (0.0000)	0.0064 (0.0003)	0.0034 (0.0828)	10,348	0.0091
	Sell	-0.0039 (0.0085)		-0.0009 (0.8544)	0.0037 (0.2732)	0.2085 (0.0089)	-0.0052 (0.0109)	-0.0010 (0.7154)	2,939	0.0031
<i>CAR (+2, +40)</i>										
Model 1	Buy	0.0351 (0.0000)	-0.0190 (0.0003)			2.4670 (0.0000)	0.0127 (0.0018)	0.0170 (0.0001)	10,348	0.0053
	Sell	-0.0302 (0.0000)	0.0402 (0.0001)			0.0849 (0.7722)	-0.0140 (0.0650)	0.0030 (0.7564)	2,939	0.0048
Model 2	Buy	0.0351 (0.0000)		-0.0204 (0.0104)	-0.0181 (0.0045)	2.4673 (0.0000)	0.0127 (0.0018)	0.0170 (0.0001)	10,348	0.0052
	Sell	-0.0301 (0.0000)		0.0104 (0.0402)	0.0416 (0.0008)	0.0833 (0.7766)	-0.0140 (0.0644)	0.0029 (0.7617)	2,939	0.0045

Tabela 2.5. Continued

		Constant	Cross-Listing	OTC Listing	Amex/ Nasdaq/ NYSE	Shares Traded	Multiple Trading per Day	Multiple Trading 30 Days	N	Adj. R2
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<i>Panel B Trading Day</i>										
<i>CAR (-1,+1)</i>										
Model 1	Buy	0.0053 (0.0013)	-0.0106 (0.0000)			0.9689 (0.0000)	0.0005 (0.8113)	0.0076 (0.0005)	10,347	0.0040
	Sell	0.0021 (0.1660)	0.0048 (0.1201)			0.1577 (0.0626)	-0.0067 (0.0024)	-0.0011 (0.7009)	2,934	0.0035
Model 2	Buy	0.0053 (0.0013)		-0.0154 (0.0000)	-0.0076 (0.0156)	0.9699 (0.0000)	0.0004 (0.8250)	0.0077 (0.0004)	10,347	0.0041
	Sell	0.0022 (0.1548)		-0.0011 (0.0333)	0.0073 (0.0406)	0.1545 (0.0687)	-0.0068 (0.0022)	-0.0012 (0.6576)	2,934	0.0038
<i>CAR (+2,+40)</i>										
Model 1	Buy	0.0358 (0.0000)	-0.0227 (0.0000)			3.3083 (0.0000)	0.0140 (0.0006)	0.0180 (0.0000)	10,347	0.0082
	Sell	-0.0303 (0.0000)	0.0348 (0.0015)			0.1524 (0.6155)	-0.0207 (0.0088)	0.0069 (0.4821)	2,934	0.0048
Model 2	Buy	0.0358 (0.0000)		-0.0208 (0.0089)	-0.0239 (0.0002)	3.3079 (0.0000)	0.0141 (0.0006)	0.0180 (0.0000)	10,347	0.0081
	Sell	-0.0304 (0.0000)		0.0431 (0.0213)	0.0312 (0.0153)	0.1568 (0.6055)	-0.0206 (0.0090)	0.0071 (0.3777)	2,934	0.046

This table presents cross sectional regressions to explain the cumulative abnormal return around insider trading announcement in 3day and 39-day windows (-1,+1) and (+2,+40), respectively. Cross-Listing is a dummy variable that equals one if the insider trading event involves a firm that is listed in the US, zero otherwise. OTC Listing, and Amex/ Nasdaq/ NYSE are dummy variables and equal one if insider trading event occurs when a firm's ADRs involve OTC listing (Level I), or listing on one of the three stock exchanges, respectively or zero otherwise. Shares Traded is a ratio of a number of shares traded by an insider to number of shares outstanding at the end of the year. Multiple Trading per Day is a dummy variable that equals one if more than one insider trades are reported in same company at the same day. Multiple Trading 30 Days is a dummy variable that equals one if more than one insider trades are reported in the same company within 30 calendar days. Size is market capitalisation

as at insider trading announcement day. Debt is a ratio of total debt to total assets. Specifications in Panel I are the ordinary least square regressions reported relative to insider trading announcement day (date of the public announcement of insider trading) in Panel A and relative to trading day (date of insider trading transaction) in Panel B. *P*-values are reported in parenthesis.

Tabela 2.6. Two Step Heckman-Type Regression Model of Cumulative Abnormal Returns around Insider Trading Announcement and Trading Day

<i>Panel I Logit – First Step Heckman-Type Procedure</i>											
	Constant	Size	Debt	M/B	Shares Traded				N	Pseudo R2	
	(1)	(2)	(3)	(4)	(5)				(6)	(7)	
Model	-22.4389 (0.0000)	0.9884 (0.0000)	2.6808 (0.0000)	0.0037 (0.0852)	2.2472 (0.6629)				13,287	0.5526	
<i>Panel II OLS - Second Step Heckman-Type Procedure</i>											
	Constant	Cross-Listing	OTC Listing	Amex/NASDAQ/NYSE	?	Shares Traded	Multiple Trading per Day	Multiple Trading 30 Days	N	R2	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	
<i>Panel II.A Announcement Day</i>											
<i>CAR (-1;+1)</i>											
Model 1	Buy	0.0123 (0.0000)	0.0003 (0.9257)		-0.0298 (0.0000)	1.4303 (0.0000)	0.0071 (0.0000)	0.0042 (0.0306)	10,348	0.0130	
	Sell	-0.0044 (0.0047)	-0.0007 (0.8617)		0.0060 (0.3262)	0.2188 (0.0063)	-0.0052 (0.0114)	-0.0012 (0.6607)	2,939	0.0032	
Model 2	Buy	0.0125 (0.0000)		-0.0043 (0.2520)	0.0052 (0.1718)	-0.0328 (0.0000)	1.4204 (0.0000)	0.0072 (0.0000)	0.0044 (0.0238)	10,348	0.0134
	Sell	-0.0044 (0.0057)		-0.0030 (0.5790)	-0.0008 (0.8738)	0.0053 (0.3859)	0.2165 (0.0069)	-0.0052 (0.0190)	-0.0012 (0.6536)	2,939	0.0030
<i>CAR (+2;+40)</i>											
Model 1	Buy	0.0464 (0.0000)	0.0436 (0.0000)		-0.1409 (0.0000)	1.9477 (0.0000)	0.0159 (0.0000)	0.0210 (0.0000)	10,348	0.0218	
	Sell	-0.0185 (0.0013)	0.1048 (0.0000)		-0.1284 (0.0000)	-0.0999 (0.7336)	-0.0137 (0.0681)	0.0087 (0.3670)	2,939	0.0156	

Table 2.6. Continued

		Constant	Cross-Listing	OTC Listing	Amex/ NASDAQ/ NYSE	?	Shares Traded	Multiple Trading per Day	Multiple Trading 30 Days	N	R2
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Model 2	Buy	0.0474 (0.0000)		0.0231 (0.0064)	0.0558 (0.0000)	-0.1546 (0.0000)	1.9033 (0.0001)	0.0161 (0.0000)	0.0219 (0.0000)	10,348	0.0235
	Sell	-0.0179 (0.0009)		0.0901 (0.0000)	0.1143 (0.0000)	-0.1324 (0.0000)	-0.1143 (0.6972)	-0.0139 (0.0641)	0.0085 (0.3763)	2,939	0.0157
Panel II.B Trading Day											
<i>CAR (-1;+1)</i>											
Model 1	Buy	0.0062 (0.0002)	-0.0055 (0.1181)			-0.0115 (0.0297)	0.9262 (0.0002)	0.0007 (0.7125)	0.0078 (0.0003)	10,347	0.0043
	Sell	0.0015 (0.3780)	0.0009 (0.8369)			0.0076 (0.2387)	0.1686 (0.0478)	-0.0068 (0.0022)	-0.0014 (0.6165)	2,934	0.0037
Model 2	Buy	0.0065 (0.0001)		-0.0111 (0.0085)	0.0007 (0.8699)	-0.0153 (0.0056)	0.9137 (0.0002)	0.0009 (0.6465)	0.0080 (0.0002)	10,347	0.0048
	Sell	0.0016 (0.3284)		-0.0037 (0.5311)	0.0039 (0.4482)	0.0064 (0.3296)	0.1640 (0.0543)	-0.0063 (0.0042)	-0.0015 (0.5934)	2,934	0.0038
<i>CAR (+2;+40)</i>											
Model 1	Buy	0.0481 (0.0000)	0.0447 (0.0000)			-0.1515 (0.0000)	2.7461 (0.0000)	0.0175 (0.0000)	0.0214 (0.0000)	10,347	0.0272
	Sell	-0.0196 (0.0009)	0.0948 (0.0000)			-0.1192 (0.0000)	-0.0189 (0.9505)	-0.0199 (0.0114)	0.0120 (0.2217)	2,934	0.0135
Model 2	Buy	0.0492 (0.0000)		0.0256 (0.0026)	0.0655 (0.0000)	-0.1644 (0.0000)	2.7039 (0.0000)	0.0176 (0.0000)	0.0220 (0.0000)	10,347	0.0286
	Sell	-0.0195 (0.0010)		0.0913 (0.0400)	0.0970 (0.0000)	-0.1201 (0.0000)	0.0224 (0.9414)	-0.0200 (0.0113)	0.0119 (0.2246)	2,934	0.0042

This table reports a two step Heckman-type regression model to explain the cumulative abnormal return around insider trading announcement in 3-day and 39-day windows (-1,+1) and (+2,+40), respectively. Specification in Panel I is a first step Heckman-type procedure, a logistic regression of a probability that a UK firm cross-lists in the US using fundamental and insider trading variables. Pseudo-R² is goodness of fit of logistic regression model, McFadden's (1974). λ is a selectivity term computed from the logistic model (the first step Heckman-type model) and used in the second step Heckman-type regression model. Cross-Listing is a dummy variable that equals one if the insider trading event involves a firm that is listed in the US, zero otherwise. OTC Listing, and Amex/ Nasdaq/ NYSE are dummy variables that equal one if insider trading event occurs when a firm's ADRs involve OTC listing (Level I), or listing on one of the three stock exchanges, respectively, or zero otherwise. Shares Traded is a ratio of a number of shares traded by an insider to number of shares outstanding at the end of the financial year. Multiple Trading per Day is a dummy variable that equals one if more than one insider trades are reported in the same company at the same day. Multiple Trading 30 Days is a dummy variable that equals one if more than one insider trades are reported in the same company within 30 calendar days. Specifications in Panel A are relative to insider trading announcement day (date of the public announcement of insider trading) and relative to trading day (date of insider trading transaction) in Panel B. *P*-values are reported in parenthesis.

the cross-listing effect disappears. The effect of cross-listing on price behaviour in post event windows is somewhat puzzling. The results confirm possible bonding effects in case of sells as we observe reduced abnormal returns (the coefficient is positive and statistically significant). However, the effect in case of purchases is reverted and abnormal returns are significantly higher for cross-listed companies. We conjecture that such findings may result from asymmetric effect of possible expropriation. The expropriation may be more severe in case of sells when insiders cash out in the anticipation of bad news leaving the uninformed investors in long positions in losing stocks. On the other hand the expropriation in case of purchases is less harmful when both insiders and outsiders gain from the price increase. Hence the bonding effect may be more pronounced for sells. The findings for insider trading day are similar in magnitude.

3. Close Bank-Firm Relationships as a Corporate Governance Mechanism in Germany

3.1. The Impact of Close Bank-Firms Relationships on Corporate Investments

A firm is financially constrained when the access to external funds is restricted. Therefore, corporate liquidity becomes a key issue and there is a need to generate internal funds for future investments. On the contrary, a company having unrestricted access to external funds is financially unconstrained. Whether a close bank-firm relationships can act as corporate governance mechanism and relax financial constraints has been discussed and empirically investigated in literature. Previous studies suggest that the effect of the relationships varies in different institutional settings and depends on the type of the corporate governance system features and level of information asymmetry (Houston and James, 2001; Hoshi et al., 1991; Fohlin, 1998; Elston, 1998, 2004).

Houston and James (2001) suggest that close bank-firm relationships do not alleviate an access to bank financing for investment expenditures within the US institutional setting. The opposite conclusion is drawn by Hoshi et al. (1991) for Japanese data. Financial liquidity is a less important investment determinant for Japanese *keiretsu* members, bank-related firms, than for non-members. The results can be explained by differences in information asymmetries in close bank-firm relationships that differ across different corporate governance systems. The role and power of banking sector in resolving information asymmetry is crucial. US banks can provide external financing for a firm as a lender and are ruled out from the list of potential shareholders, whereas Japanese banks can act simultaneously as lender and shareholders for one company. The role of banks in Japan is also enhanced because private debt is more popular than public debt. Overall, the issue of information

asymmetry is more severe in Japan than in the United States. Particularly in case when close bank-firm relationships serve as a corporate governance mechanism, Japanese banks may face less information asymmetry than the US banks. In Japan, banks have opportunities to establish closer ties with public companies through lending and ownership and thus gather more information than is publicly available.

Our investigation focuses on the unique German institutional setting where banks play an important role in the corporate governance system. Despite their importance the consequences of close bank-firm relationships in Germany remain an open issue. Gorton and Schmid (2000) as well as Elsas and Krahen (2003) stress that due to lack of a theoretical framework and insufficient empirical investigations covering the peculiarities of the German corporate governance system still little is known about the benefits and costs of bank-firm relationships. Previous empirical studies on German companies concerning the implications of close bank-firm relationships provide mixed results. On the one hand, Fohlin (1998) finds that bank dependence does not mitigate financial constraints. On the other hand, Elston (1998, 2004) suggests that bank-related firms have higher survival rates. Moreover, investment is less sensitive to internally generated funds for bank-related firms than for independent firms. The contradicting findings may be due to different bank dependence definitions and observation periods, as the methodological approach applied in all investigations arises from the same roots and is based on the Q theory of investment (Brainard and Tobin, 1968; Tobin, 1969; Fazzari, Hubbard and Petersen, 1988).

Fohlin (1998) investigates a sample of 75 manufacturing firms in Germany over the period when universal banking was established (1903-1913). The findings provided in Elston (1998, 2004) rely also on manufacturing firms but cover a period spanning the late sixties and mid eighties. Both authors incorporate characteristics of the German

corporate governance system to define close bank-firm relationships. Fohlin measures close bank-firm relationships based on representatives sitting in supervisory and executive boards as an implication of equity holdings and Elston uses direct ownership by financial institutions.

The peculiarities of the German corporate governance system together with the mixed and scarce evidence on close bank-firm relationships in Germany motivate our investigation. The aim of this section is to investigate whether close bank-firm relationships act as a corporate governance mechanism and relax financial constraints in German firms. Specifically, we test whether investments are less sensitive to cash flows in companies having close bank relationships than in those without close bank relationships.

The approach developed by Fazzari et al. (1988) is applied to measure the propensity to secure future investment needs from internally generated cash flow. The technique builds on the correlation between investment spending and internally generated cash flows. In case of financially constrained firms investments depend primarily on internal financing, whereas investments in financially unconstrained firms are less sensitive to internal financing and more dependent on the availability of positive net present value projects. Despite the considerable number of studies using the liquidity sensitivity of investments, Kaplan and Zingales (1997, 2001) cast doubt on the robustness of the methodology. The most recent evidence provided by Moyen (2004) reconciles, however, the conflicting issues and demonstrates that the criterion used to identify financial constraints is essential in interpreting empirical results.

3.2. Data and Descriptive Statistics

The data used are collected from three different sources: the Bonner Database, the Markus Database and the database provided by the Bundesanstalt für Finanzdienstleistungsaufsicht.⁷ Accounting data are taken from the unique Bonner Database, which provides access to annual balance sheets, profit and loss statements and a large number of financial ratios for large German manufacturing companies. Information on direct and proxy banks' holdings of control rights are extracted from the database of the Bundesanstalt für Finanzdienstleistungsaufsicht. The number of house banks connected with each firm is from the Markus database.

Our sample spans period 1960 and 1997. We use the Bonner Database because of its uniqueness and high quality. It includes long accounting data series with low number of missing observations. It is impossible to extend the data series consistently because different accounting data definitions are used by different data providers. Using any other database would also imply shortening the data series by about 25 years and significant decrease in number of observations. To the best of our knowledge no one has investigated such a long period so far, and according to Fohlin (1998) the effect of a close bank-firm relationships may be more pronounced in the long-run due to efficiency gains.

We use two measures of bank-firm relationships, bank control rights and the number of house bank affiliations where control rights is a sum of direct and proxy control rights. Direct ownership is an obvious measure and is applied in previous literature and we extend the approach to capture the real power in the decision making process. Proxy-voting on behalf of minority shareholders gives the bank a tool to influence operating, investment and financing decisions

⁷ The Bundesanstalt für Finanzdienstleistungsaufsicht is a German counterpart of the Securities and Exchange Commission in the United States.

but is not associated with any cash flow rights. We do not have any information available on supervisory board structures. Therefore, we are not able to perform a more direct measure of bank representatives' influence on firms' investments. Nevertheless, having a supervisory board representative is a natural consequence of being a significant shareholder. Thus the bank representatives' influence on firms' investments is indirectly incorporated through the measure of bank control rights. Bank control rights are based on bank voting rights in 1997 and aggregated over all banks for a given firm. The number of house bank affiliations is extracted from summary information on house banks and represents the actual number of house banks for each firm.

We assume those companies with bank control rights and those having single house bank affiliation to have close ties to the banks, whereas those without bank control rights and with multiple house bank attachments as not having particularly close bank-firm relationship. We expect that firms with bank control rights and a single house bank affiliation to have easier access to external funds. Close bank-firm relationships in Germany can reduce information asymmetry and enable banks to supply more external financing to a firm and consequently increase investment. Banks acting as shareholders may be willing to finance relatively large capital expenditure because they already have and are able to enlarge an equity stake in the firms they lend to (Houston and James, 1996). At the same time, banks participate in the companies' management and can monitor and control managers on behalf of shareholders and insure higher efficiency. Most of the theory on financial intermediation suggests that one bank lender is the optimal number of creditors (Elsas and Krahen, 2003). A single house bank affiliation should facilitate less severe information asymmetry, taking into consideration particularly a tight cooperation with one bank

as well as a supportive and protective role of house banks, in general. From this point of view, we expect that the external financing availability is relatively easy for firms affiliated to one house bank.

Our sample includes companies for which we have information on either or both bank control rights and house banks. We have 8,277 firm-years observations in our final sample, for 6,798 we have information on bank control rights and for 5,356 we have information on house bank affiliation. Next, we classify the observations according to financial constraint criterions⁸.

Table 3.1 reports the cross-classification of the number of firm-years, the average bank control rights and the average number of house bank affiliations. The majority of companies in our sample do not have any bank control rights and they maintain multiple house bank relationship. Table 3.1 also presents the association among the different bank-firm relationships, illustrating the bank relationship interactions across companies in different groups. For example, among 5,474 firm-years considered to be financially constrained according to bank control rights 2,701 are also constrained according to number of house banks, while 437 are considered unconstrained. Most of the firms with multiple house banks have no commitment with bank representing shareholder rights.

Taking into account a distribution of control rights and house bank attachments across the analysed groups of companies we can see that they are significantly different in each group. As a result, we can consider the impact of both measures separately. Firms with bank control rights tend to have multiple house bank affiliation, with the mean of 3.5. Similarly, if an influence of single house bank is assumed to relax

⁸ The sample selection process may imply selectivity bias. We address this issue in section 3.3.2.

Table 3.1. Cross-Classification across Types of Bank Relationships

	Number of Firm – Year Observations	Average Bank Control Rights	Average Number of House Banks
	(1)	(2)	(3)
No Bank Control Rights	5,474	0	3.9
Bank Control Rights (%)	1,324	27.8	3.5
Multiple House Bank Firms	4,603	6.3	4.1
Single House Bank Firms	753	4.2	1
No Bank Control Rights AND Multiple House Bank Firms	2,701	0	4.4
No Bank Control Rights AND Single House Bank Firms	437	0	1
Bank Control Rights AND Multiple House Bank Firms	739	29.4	3.8
Bank Control Rights AND Single House Bank Firms	69	30.5	1

This table reports the cross-classification of the number of firm-years observations, the average bank control rights and the average number of house bank affiliations under each category used to identify firm as closely related to banks. The sample includes only large German manufacturing firms and the sample period is 1960 through 1997.

financial constraints, an influence of bank control rights is limited. The mean of bank control rights is 4.2 %, compared to 27.8 % for firms with bank control rights.

Following previous studies on firms' liquidity sensitivity of investment, we define investment as expenditures on plant, property and equipment. Cash flow is income before extraordinary items plus depreciation minus dividends. Cash holdings are equal to total cash and marketable securities. These variables are scaled by the level of fixed capital at the beginning of the year, represented by the sum of net property, plant and equipment. Tobin's Q and sale describe profitability of investments opportunities. There are many controversies in the literature on how to measure

Table 3.2. Summary Statistics

	Bank Control Rights								Number of House Banks							
	All Firms		Firms with no Bank Control Rights		Firms with Bank Control Rights		Tests for Differences no Bank control rights vs. Bank Control Rights (p-value)		All Firms		Firms with Multiple House Banks		Firms with Single House Bank		Tests for Differences Multiple House Banks vs. Single House Bank (p-value)	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Investment	0.572	0.233	0.629	0.221	0.338	0.277	0.002	0.000	0.501	0.228	0.540	0.234	0.262	0.183	0.000	0.000
Cash Flow	0.927	0.333	0.985	0.307	0.687	0.437	0.030	0.000	0.641	0.322	0.672	0.333	0.450	0.258	0.268	0.000
Q (x100)	149	128	148	126	154	136	0.001	0.000	155	129	158	131	143	120	0.000	0.000
Sale	8.338	4.130	8.689	4.028	6.887	4.465	0.422	0.000	11.26	4.106	12.049	4.129	5.491	3.844	0.034	0.002
Cash Holdings	1.077	0.088	1.011	0.081	1.351	0.123	0.120	0.000	0.845	0.088	0.897	0.088	0.532	0.090	0.002	0.310
Coverage Ratio	32	8	33	8	27	9	0.006	0.134	25	8	26	7.9	19	7.55	0.001	0.030
Leverage	0.641	0.650	0.641	0.651	0.641	0.648	0.909	0.681	0.634	0.645	0.631	0.642	0.653	0.662	0.000	0.000
Size	5.139	4.981	5.090	4.890	5.340	5.462	0.000	0.000	4.893	4.758	4.871	4.724	5.027	4.890	0.040	0.002
Age (years)	33	36	33	36	35	36	0.000	0.000	33	36	33	36	32	35	0.000	0.000

This table reports summary statistics across firms with and without close bank relationship. Variables are calculated for all firms fitting the criteria. Investment, cash flow, sale and cash holdings are scaled by the level of fixed capital at the beginning of the year. Size is equal to natural logarithm of total assets. The p-values are performed for t-test for differences in means and Kruskal-Wallis test for location between firms with no bank control rights and firms with control rights (firms with multiple and single house bank attachment). The t-test null hypothesis is: there is no difference in means between the two groups. The Kruskal-Wallis against null hypothesis is: there is no difference in location. The sample includes only large, German manufacturing firms and the sample period is 1962 through 1997.

Q properly. To avoid any inconsistency we rely on the Q reported in the Bonner database. We use the lag of sale scaled by the level of fixed capital at the beginning of the year. Other firm characteristics are coverage ratio, leverage, firm's size and age. Leverage is calculated as the ratio of total debt to total assets. The coverage ratio consists of earnings before interest rate plus taxes and depreciation divided by interest expenses. Firm size is a natural logarithm of assets. The number of firm-years for each single firm is a proxy for its age.

Summary statistics for firms with both bank-firm relationship types are reported in Table 3.2. The table is divided into two main parts relating to bank control rights and number of house banks. Mean and median values are shown for all firms, those with no bank control rights and multiple house banks and those with bank control rights and single house bank. The nature of the bank-firm relationship and the level of investments varies with the firm size. Firms with bank control rights and a single house bank have lower level of investments. P-value of the differences in means between companies without bank control rights and bank control rights is 0.002 and 0.000 between companies with multiple and single house banks. The firms with bank control rights and a single house bank are on average also larger. P-value of the differences in means between companies without bank control rights and with control rights, and between companies with multiple and single house banks attachments are 0.000 and 0.040, respectively. The level of cash flows and Q indicate that companies with bank control rights have significantly more profitable future investment opportunities but lower cash flows. Cash holdings, coverage ratio and leverage suggest that there is no major difference in liquidity between firms with and without bank control rights. These findings may give an early indication that companies with bank control rights are indeed less financially constrained in their

investments. On the contrary, liquidity matters in case of house bank attachment. Companies with single house bank appear to be significantly less liquid than companies with multiple house banks. Single house bank firms have also significantly worse investment prospects. One interpretation of these results may be that companies with single house bank, regarded as financially unconstrained may have lower liquidity indicators but they do not have to store the liquidity because they have better access to external financing.

3.3. Methodology and Empirical Results

The empirical analysis is conducted in two steps. First, we investigate the liquidity sensitivity of investment of firm groups with different bank affiliation types. Second, the endogeneity problem is taken into consideration, as it may be incorrect to assume a causal relationship between bank affiliation and firms' sensitivity of investment. To address both issues we implement the methodology applied in similar studies, such as Fohlin (1998) and Houston and James (2001).

3.3.1. Liquidity Sensitivity of Investment: Fixed Effect Model Estimations

We use the following investment equation specification to empirically investigate the liquidity sensitivity of investment:

$$I_{i,t}/k_{i,t-1} = \mathbf{a}_0 + \mathbf{a}_1 CF_{i,t}/k_{i,t-1} + \mathbf{a}_2 Q_{i,t-1} + \mathbf{a}_3 CH_{i,t}/k_{i,t-1} + \mathbf{a}_4 S_{i,t-1}/k_{i,t-1} + \mathbf{e}_{i,t} \quad (3.1)$$

The dependent variable is defined as expenditures on plant property and equipment $I_{i,t}$ scaled by the beginning of the period stock of fixed capital (plant, property and equipment) $k_{i,t-1}$. Cash flow $CF_{i,t}$ is the key explanatory variable of interest

that measures internally generated funds flow. A positive and statistically significant cash flow coefficient α_1 indicates financial constraints as well as high liquidity sensitivity of investment and is expected to increase with the level of information asymmetry. Tobin's Q $Q_{i,t-1}$ and sales $S_{i,t-1}$ are included to control for firm's profitability of future investments. Q and sales should be included in the investment equation simultaneously to fully capture the prospects of investments.⁹ Moreover, cash holdings $CH_{i,t}$ are incorporated in the investment equation. Cash holdings represent accumulated liquid resources that may also affect investment. To control for heteroscedasticity and a size effect investment, cash flow and cash holdings are scaled by fixed capital ($k_{i,t-1}$). To explicitly control for possible simultaneity bias we included firm fixed effect while estimating equation (3.1).

Table 3.3 reports the empirical results obtained from the estimation of the investment equation (3.1). Columns (1) to (3) refer to the group of firms related to bank control rights and the next three columns (4) to (6) to the firms related to house banks. Investment is positively and significantly associated to cash flow in each tested group. More important, the findings demonstrate that the level of liquidity sensitivity of investment varies substantially between the groups of firms with and without close bank-firm relationships. The estimated cash flow sensitivities for firms with bank control rights and a single house bank are considerably lower than coefficients on the cash flow variable for firms without bank control rights and with multiple house banks, 51 and seven times, respectively. Investment is also positively and significantly related to the level of investment opportunities (Q) in case of firms with close bank ties,

⁹ If investment equation includes only Q or sales there may be a problem with interpreting coefficient on cash flow. Fazzari et al. (1988) argue that in such a case the significance of cash flow could signal profitability of future investments in addition to the cash low sensitivity of investments.

Table 3.3. Fixed Effect Regressions

	Bank Control Rights			Number of House Banks		
	All Firms	Firms with no Bank Control Rights	Firms with Bank Control Rights	All Firms	Firms with Multiple House Banks	Firms with Single House Banks
	(1)	(2)	(3)	(4)	(5)	(6)
Cash Flow	0.699 ^{***} (0.008)	0.718 ^{***} (0.009)	0.014 ^{***} (0.003)	0.144 ^{***} (0.005)	0.144 ^{***} (0.005)	0.020 ^{***} (0.006)
Q	-0.001 [*] (0.000)	-0.001 (0.001)	0.001 ^{***} (0.000)	0.001 [*] (0.001)	0.001 (0.001)	0.001 ^{***} (0.000)
Cash Holdings	-0.008 (0.008)	-0.004 (0.009)	-0.001 (0.002)	0.267 ^{***} (0.009)	0.268 ^{***} (0.010)	0.015 [*] (0.009)
Sales	-0.002 ^{***} (0.000)	-0.002 ^{***} (0.000)	-0.001 (0.000)	0.001 ^{***} (0.000)	0.001 ^{***} (0.000)	0.014 ^{***} (0.003)
Joint Significance Test (p-value)	0.000	0.000	0.000	0.000	0.000	0.000
F-Test Ho: No Fixed Effect (p-value)	0.000	0.000	0.000	0.000	0.000	0.000
Adj. R2	0.65	0.67	0.12	0.34	0.34	0.17
N	6,798	5,474	1,324	5,356	4,603	753

This table reports fixed effect regressions estimation relating investment to cash flow, Tobin's Q, cash holdings and sale for firms with and without close relationship with banks. An F-test of joint significance of regressors and an F-test against the hypothesis that there is no fixed effect are displayed. The sample includes large, German manufacturing firms and the sample period is 1960 through 1997. ^{***}, ^{**} and ^{*} indicate significance at 0.01, 0.05 and 0.10 levels, respectively. Standard errors are in parentheses.

bank control rights and single house bank. Positive and significant sales' coefficient for companies with house bank attachment is an important indicator of future investment prospects, but appears more important for single house bank firms. Moreover, greater liquidity sensitivity of investment for firms with multiple house banks is associated with greater sensitivity of current cash holdings. The cash holdings' coefficient is fourteen times higher than for firms with single house bank. Our findings are also corroborated by adjusted R². The investment equation yields better goodness

of fit for group of firms with close bank ties than for those without. The results imply that investments are much more sensitive to cash flows in companies without close relationship with banks. The test for joint significance of the regressors, and the F-test against the hypothesis of no fixed effect suggest that the regression model is suitable to test the cash flow sensitivity of investment in both groups of firms.

Overall, the results in Table 3.3 are consistent with the hypothesis that close bank-firm relationships relax financial constraints. Our empirical results show that firms having close ties to the banks and regarded as financially unconstrained appear to face less difficulties in gathering external funds than financially constrained firms. Investments for firms with bank control rights (single house bank attachment) seem to be much less sensitive to internal liquidity than for firms without bank voting rights (multiple house bank attachment). According to the view that close bank-firm relationships diminish information asymmetry our results confirm that the access to external funds is less difficult for companies with close bank-firm relationship.

Consistent with previous literature we find a strong relationship between investments and internally generated funds (Hoshi et al. 19991; Houston and James, 2001). However, we show that most of the magnitude of the cash flow sensitivity of investment is driven by bank unrelated firms. Our findings tend to be contradictory to those presented by Fohlin (1998) and are in line with the ones in Elston (1998). Fohlin (1998) concludes that investment is more sensitive to internally generated cash flow for bank related firms than for unrelated firms. The differences in the empirical results may be explained by different bank-firm relationships definitions, sample periods and sample lengths.

3.3.2. *Selectivity Bias*

Due to the possibility of endogeneity we investigate whether the relationship between bank attachment and firm's cash flow sensitivity of investment is indeed causal. We assume that liquidity sensitivity of investment is strictly related to a close bank-firm relationship. However, a selectivity bias may appear because the relationship may be commenced either by a firm or by a bank. If a firm wants to establish a close relationship with a bank it needs to assure its creditworthiness and, therefore, may be considered as less constrained. On the contrary, when a bank pursues the attachment in order to monitor future investments and outcomes then the firm with bank affiliation may be deemed as financially constrained.

Some of the problems related to selectivity bias are captured by the fixed effect model that controls for an influence of firm specific effects. However, if the selectivity bias is connected to features other than firm identity, Fohlin (1998) recommends the estimation of a two stage model of investment and affiliation using the Heckman-type procedure (Heckman, 1979).

The set of the equation is:

$$I_{,it} / k_{i,t-1} = \mathbf{a} + \underline{\mathbf{B}}' \underline{\mathbf{X}}_i + dCF_{i,t} / k_{i,t-1} + \mathbf{e}_i \quad (3.2)$$

$$Close\ BF\ relationship_i^* = \underline{\mathbf{g}}' \underline{\mathbf{W}}_i + \mathbf{x}_i \quad (3.3)$$

Assumptions:

$$\mathbf{e}_i \text{ are } N(0, \mathbf{s}^2)$$

$$corr(\mathbf{e}_i, \mathbf{x}_i) = \mathbf{r}$$

where model (3.2) represents model (3.1) and $CF_{i,t}$ correspond to cash flows as in equation (3.1), \underline{X}_i is a set of remaining explanatory variables included in equation (3.1). $Close\ BF\ relationship_i$ is a dummy variable that equals one for companies with close bank-firm relationships, and zero, otherwise, \underline{W}_i represents a set of potential determinants of close bank-firm relationship. The close bank-firm relationship is determined in the following way:

$$Close\ BF\ relationship_i = \begin{cases} 1, & \text{if } Close\ BF\ relationship_i^* > 0 \\ 0, & \text{if } Close\ BF\ relationship_i^* \leq 0 \end{cases} \quad (3.4)$$

The variable $Close\ BF\ relationship_i$ is assumed to result from an unobservable variable $Close\ BF\ relationship_i^*$. The correlation between $Close\ BF\ relationship_i^*$ and \mathbf{e}_i is nonzero if \underline{W}_i , the set of exogenous variables in the model (3.3), affects $I_{i,t} / k_{i,t-1}$, and if the residuals, \mathbf{e}_i and \mathbf{x}_i , are correlated. Equations (3.2) and (3.3) are estimated using the Heckman (1979) approach. Under the above assumptions, the expected value of $I_{i,t} / k_{i,t-1}$ for a company with close bank-firm relationship is:

$$E(I_{i,t} / k_{i,t-1} | Close\ BF\ relationship_i = 1) = \mathbf{a} + \underline{B}' \underline{X}_i + \mathbf{d} + \mathbf{rs}_e \mathbf{I}_{il}(\underline{g}' \underline{W}_i) \quad (3.5)$$

$$\mathbf{I}_{il}(\underline{g}' \underline{W}_i) = \mathbf{f}(\underline{g}' \underline{W}_i) / \Phi(\underline{g}' \underline{W}_i) \quad (3.6)$$

where $\mathbf{I}_{il}(\underline{g}' \underline{W}_i)$ is the 'inverse Mills' ratio', $\mathbf{f}(\cdot)$ and $\Phi(\cdot)$ are the density functions and cumulative distribution functions for the standard normal, respectively. The expected value of $I_{i,t} / k_{i,t-1}$ for a company without close bank-firm relationship is:

$$E(I_{i,t} / k_{i,t-1} | \text{Close BF relationship}_i = 0) = \mathbf{a} + \underline{\mathbf{B}}' \underline{\mathbf{X}}_i + \mathbf{rs}_e \mathbf{I}_{i2}(\underline{\mathbf{g}}' \underline{\mathbf{W}}_i) \quad (3.7)$$

$$\mathbf{I}_{i2}(\underline{\mathbf{g}}' \underline{\mathbf{W}}_i) = -\mathbf{f}(\underline{\mathbf{g}}' \underline{\mathbf{W}}_i) / [1 - \Phi(\underline{\mathbf{g}}' \underline{\mathbf{W}}_i)] \quad (3.8)$$

In the first step the Heckman procedure estimates $\underline{\mathbf{g}}$ using a logit model. Next, these consistent estimates are used to calculate \mathbf{I}_{i1} and \mathbf{I}_{i2} . The second step of the procedure involves estimation of model (3.2) with additional term \mathbf{I}_i , to correct for the selection bias.

$$I_{i,t} / k_{i,t-1} = \mathbf{a} + \underline{\mathbf{B}}' \underline{\mathbf{X}}_i + \mathbf{dCF}_{i,t} / k_{i,t-1} + \mathbf{d}_1 \mathbf{I}_i + \mathbf{n}_i \quad (3.9)$$

Parameter \mathbf{d}_1 is associated with the correlation between \mathbf{e}_i and \mathbf{x}_i , and assesses the correlation between unobserved factors affecting the likelihood of bank attachment and unobserved firm effects.

Table 3.4 reports the results of the logit estimation procedure used to predict the probability of attachment. The columns present the nature of the bank relationship considered in our investigation. Consistent with the findings in Fohlin (1998) and Houston and James (2001), Q and age indicate bank affiliation. This implies that older firms with large growth opportunities are more likely to have a bank as a shareholder or to rely on a multiple house bank relationship. The firms with bank control rights are additionally also larger but have lower liquidity. Within the group of firms with house bank attachment, leverage coefficient is statistically significant, indicating that a single house bank attachment is characteristic for young firms

Table 3.4. Logit Regression Results

	Bank Control Rights vs. No Bank Control Rights Firms	Single vs. Multiple House Banks Firms
	(1)	(2)
Q	0.001 ^{***} (0.000)	-0.001 ^{**} (0.001)
Leverage	0.0096 (0.212)	0.728 ^{***} (0.275)
Coverage Ratio	-0.001 ^{***} (0.000)	-0.001 (0.001)
Sale	0.000 (0.000)	-0.014 ^{***} (0.005)
Size	0.087 ^{***} (0.017)	-0.024 (0.021)
Age	0.097 ^{***} (0.009)	-0.013 ^{**} (0.006)
Pseudo R2	0.04	0.02
N	6,798	5,356

This table reports logistic regression relating the nature of banking relationship to Tobin's Q, leverage, coverage ratio, sale, size, and age. The sample includes large, German manufacturing firms and the sample period is 1960 through 1997. ^{***}, ^{**} and ^{*} indicate significance at 0.01, 0.05 and 0.10 levels, respectively. Standard errors are in parentheses.

with high level of debt and lower sales. Overall, different features describe close bank-firm relationship in case of control rights and in case of house banks and are consistent with results from Table 3.2.

The results of the random effect model are reported in Table 3.5. Similarly to Fohlin (1998) and Houston and James (2000) the findings suggest that the effects of selectivity bias on liquidity sensitivity of investment are limited. The selectivity term is negative and significant for firms with bank control rights and insignificant in all other cases. The cash flow coefficients are unchanged and are significantly lower for firms with close bank-firm relationships. Furthermore, the exclusion of the selectivity term from the regression does not alter the values and significance of the cash flow coefficient. Hence, the selectivity bias does not explain the greater liquidity sensitivity of investment in our analysis.

Table 3.5. Random Effects Regressions

	Bank Control Rights		Number of House Banks	
	Firms with no Bank Control Rights	Firms with Bank Control Rights	Firms with Multiple House Banks	Firms with Single House Banks
	(1)	(2)	(3)	(4)
Selectivity Term	0.453 (1.228)	-1.113*** (0.401)	-0.576 (2.800)	-1.085 (0.723)
Cash Flow	0.719*** (0.008)	0.014*** (0.003)	0.148*** (0.005)	0.020*** (0.006)
Q	-0.001* (0.001)	0.001*** (0.000)	0.000 (0.001)	0.001** (0.000)
Cash Holdings	-0.021** (0.009)	-0.001 (0.001)	0.235*** (0.009)	0.017** (0.008)
Sale	-0.002*** (0.000)	-0.001 (0.001)	0.001*** (0.00)	0.008*** (0.003)
Joint Significance Test (p-value)	0.000	0.000	0.000	0.000
Adj. R2	0.65	0.04	0.30	0.06
N	5,474	1,324	4,603	753

This table reports random effect regressions estimation relating investment to selectivity term, cash flow, Tobin's Q, cash holdings and sale for firms with and without close relationship with banks. An F-test of joint significance of regressors is displayed. The sample includes large, German manufacturing firms and the sample period is 1962 through 1997. ***, ** and * indicate significance at 0.01, 0.05 and 0.10 levels, respectively. Standard errors are in parentheses.

4. Ownership Structure as a Corporate Governance Mechanism in an Emerging Market

4.1. The Impact of Corporate Ownership Structure on the Information Content of Earnings

Earnings provide primary information that investors use in stock valuations and investment decisions. In a recent study, Asquith, Mikhail and Au (2005) analyse the content of over 1,100 security analyst reports and find that 99.1% of analysts apply earnings multiples to set price targets, while methods based on asset multiples or discounted cash flows are used by only 25.1% and 12.8% of them, respectively. To serve as a good basis for valuation, reported accounting earnings should give a true and fair view of the firm's profitability. This chapter provides an analysis of the information content of accounting earnings on the Polish stock market.

The investigation concentrates on the Polish market for a number of reasons. Firstly, prior works by Jermakowicz and Gornik-Tomaszewski (1998), and Gornik-Tomaszewski and Jermakowicz (2001) document a significant association between stock returns and annual earnings for Polish listed companies. This investigation extends their examinations by testing the influence of corporate ownership structure on the explanatory power of earnings for stock returns. Secondly, the Polish market is the largest among all Central European emerging stock markets. Warsaw Stock Exchange is more than twice as large as Budapest and Prague Stock Exchanges in terms of market capitalisation and more than four times as large in terms of number of listed companies.¹⁰ Thirdly, the Polish stock market has relatively short history and dates back only to the early 1990's when other non-European developing markets were already

¹⁰ According to the Federation of European Securities Exchanges, market capitalisation (in million Euros) and number of listed companies as of March 2005 are as follows: Warsaw Stock Exchange – 53,417.56 and 223; Prague Stock Exchange – 25,145.25 and 54; Budapest Stock Exchange – 23,913.56 and 45.

established. Core capital market institutions and relevant regulations in Poland were introduced and enforced as part of the economic transformation into a market economy just about fifteen years ago (Glaeser, Johnson and Shleifer, 2001). Although the law on the books is brought into correspondence with the European Union Directives, the level of investor protection and law enforcement remain low (Pistor et al., 2000). Corporate governance ratings of Polish listed companies prepared by the Polish Forum for Corporate Governance demonstrate that companies either do not introduce policies to protect shareholder rights or create regulations that are clearly controversial and do not comply with international standards.¹¹ The high quality law on the books, low level of law enforcement, and weak corporate governance system in Polish listed companies create particularly interesting environment to test the relationship between managerial ownership and the information content of earnings.

Managers in countries with weak investor protection may have incentives to extract private benefits of control by creating value only for themselves and by adopting accounting disclosure policies that conceal their activities from outside shareholders. This effect is expected to be particularly pronounced when the managerial ownership is high. In such cases, the quality of reported earnings may be lower, and accounting information is likely to be less useful in the stock valuation process. Previous literature lends support to the importance of corporate governance system for the impact that managerial holdings have on the information content of earnings. Warfield, Wild and Wild (1995) analyse US companies and find a positive relationship between managerial ownership and the information content of earnings. On the other hand, Gabrielsen, Gramlich and Plenborg (2002) provide the opposite result for Danish

¹¹ Two editions of Corporate Governance Rating of Polish Listed Companies were prepared by the Polish Forum for Corporate Governance in 2001 and 2003. Detailed information is available on www.pfcg.org.pl.

companies. The United States are considered to be the country with the highest investor protection standards and strong legal enforcement, whereas Denmark, despite good legal enforcement, is mainly characterised by weaker investor protection regulations (La Porta et al., 1998). Moreover, the markets differ in corporate ownership characteristics. The US is a typical outsider economy with large stock market and dispersed ownership, while in Denmark heavily concentrated holdings with large insider and family ownership are prevalent (La Porta et al., 1997, 1998).

Weak investor protection, poor law enforcement and influential managers are frequently associated with concentrated ownership. In emerging markets, the concentration of ownership may be a form of adaptation to poor legal protection, because only large shareholders can monitor managers and avoid expropriation. The literature suggests that unrelated block owners can help to improve weak corporate governance system by acting as a partial substitute for missing corporate governance mechanisms (Shleifer and Vishny, 1997; Lins, 2003). Accordingly, this study tests a hypothesis that managerial ownership has a negative impact on the information content of earnings in companies with low external block holdings and positive impact in companies with high external block holdings. In this respect, the design of this analysis is similar to Yeo, Tan, Wai and Chen (2002). They extend the approach of Warfield et al. (1995) and Gabrielsen et al. (2002) and allow for non-linear relationship between managerial ownership and information content of earnings in their analysis of Singaporean companies. However, they partition their sample on the basis of managerial rather than outside block holdings and find the positive relationship up to a certain level of managerial ownership, whereas the negative relationship is observed at higher level of managerial ownership. They also show that external unrelated block holdings increase the informativeness of earnings.

4.2. Data and Sample Selection

4.2.1. Corporate Ownership

We use a unique large database of corporate ownership structure in Polish companies listed on the Warsaw Stock Exchange (WSE). The data is hand collected from annual financial reports published by Polish listed companies through the Emitent system and cover the four-year period between 1999 and 2002. The Emitent system is aimed at ensuring efficient and safe transfer of information required by the Act on Public Trading in Securities of 21 August 1997. Established in 1999, the system enables anyone to access the information transmitted by a company to the public without the intermediation of news agency. Polish listed companies are obliged to disclose ownership structure in annual financial reports, and the information includes the number of shares held by managers and unrelated block holders. The specific disclosure requirements are defined in the Act on Public Trading in Securities of 21 August 1997 and in the Decree of the Council of Ministers of 16 October 2001. Managers are obliged to inform their company about any holdings of the firm's stocks and changes to the holdings. In the same way, unrelated blockowners report their holdings of 5 per cent or more of total shares outstanding and then any changes from this cut-off point. The information published in periodical financial statements includes: name of the shareholder (first name and surname in case of managers and private persons, and company name in case of corporations), number of shares owned and percentage of ownership.¹²

Given these legal requirements, we define the managerial ownership as a percentage of shares outstanding held by managers and their family members. A manager, for the purpose of this study, is defined as a management board member,

¹² In some cases, the cash flow rights are reported together with the actual control rights. However this is not standard information, therefore we rely on the information on cash flow rights.

a person acting as a management board member or an administrator.¹³ Following previous literature (e.g. Lins, 2003) we identify family members based on overlapping surnames, however we are aware that the requirement of overlapping surnames may cause a downward bias in estimated managerial ownership. Unrelated block ownership is defined as the sum of all reported holdings of more than 5 per cent and not included in managerial ownership.

4.2.2. *Accounting Data, Stock Prices and Sample Size*

Accounting data are provided by Notoria, and daily stock prices and information on dividends, both adjusted for stock splits, are from the WSE. Notoria is a data vendor providing data on all companies listed on the WSE to many news agencies including Reuters, and its database includes the following information for each company: company name and address, name of the current CEO, quarterly and annual financial statements and main financial ratios for last five quarters and five years, respectively. Financial statements consist of balance sheets, profit and loss accounts and cash flow statements. We extract accounting data and financial ratios required for our investigation from annual financial statements. Our accounting data and stock prices cover annual information for years 1998 to 2002. The sample period includes both the bull market (January 1999 to March 2000) and bear market (April 2000 to December 2002).

Following a standard approach, we exclude financial companies from our analysis because of their different accounting and reporting rules. Similarly,

¹³ According to Decree of the Council of Ministers of 16 October 2001 the definition of managing person is ‘person who has major influence on the management of the issuer, including: a management board member, person acting as a management board member, proxy, administrator, commissioner or liquidator’.

we eliminate National Investment Funds (NIFs).¹⁴ Companies with data available for less than three consecutive years have to be excluded due to methodological requirements. We apply panel data methodology and at least two firm year observations for each company are required, and furthermore, the third year of data is needed as some of the variables are scaled by lagged total assets. The methodological issues are explained in more detail in the third section of the chapter. The screening resulted in 149 non-financial companies and 469 firm year observations. On average, there were about 200 companies listed on the WSE over the sample period, among them 25 financial firms and 15 NFIs.

4.2.3. *Descriptive Statistics*

We employ definitions of financial variables commonly used in studies of the information content of earnings (Warfield et al., 1995; Gabrielsen et al., 2002). $E_{i,t}/P_{i,t-1}$ and $R_{i,t}$ stand for earnings and stock returns for a company i at time t , respectively. Earnings are defined as net earnings per share scaled by stock price from the beginning of the year. Stock returns are measured for the twelve-month period extending from nine months prior to the fiscal year-end through to three months after the fiscal year-end. The return definition is consistent with the deadline for annual report filing, which in Poland is three months after the firm's fiscal year-end. Thus, it is expected that the stock prices incorporate all the relevant information from financial statements.

¹⁴ National Investment Funds (NIFs) were invented and introduced as a part of the Polish Mass Privatization Program. The program involved the selection of 512 medium and large state owned companies and the allocation of 60 per cent of their shares to 15 NIFs to act as the dominant owner of these companies and as intermediaries between the citizens and companies. The ownership of NIFs was then transferred to the adult population through a universal share certificate which was later converted to a share in each of the 15 NIFs (see Puntillo, Ispen and Dietrich, 1996).

Table 4.1. Descriptive Statistics

<i>Panel A Descriptive Statistics</i>											
	All			Low BLOCK			High BLOCK			Tests	
	Mean	Std. Dev.	Median	Mean	Std. Dev.	Median	Mean	Std. Dev.	Median	t-test differences in means between (4)-(7) p-value	Kruskal-Wallis between (6)-(9) p-value
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
$R_{i,t}$	0.0001	0.6416	-0.1077	-0.0039	0.7044	-0.0940	0.0043	0.5711	-0.1176	0.8897	0.7771
$E_{i,t}/P_{i,t-1}$	-0.1728	1.0944	0.0377	-0.1903	1.0448	0.0400	-0.1548	1.1452	0.0318	0.7263	0.5057
Managerial Ownership	0.0975	0.1993	0.0049	0.1795	0.2526	0.0494	0.0131	0.0309	0.0007	0.0001	<0.0001
Unrelated Block Ownership	0.5461	0.2525	0.5908	0.3482	0.1874	0.4077	0.7514	0.1038	0.7318	<0.0001	<0.0001
Size	10.8653	1.8369	10.6201	10.5702	1.7563	10.3046	11.1693	1.8633	11.1665	0.0004	0.0004
Debt	0.4291	0.2453	0.4147	0.4444	0.2226	0.4239	0.4133	0.2662	0.3990	0.1714	0.0540
Growth	1.0472	1.7345	0.7636	1.1037	1.7400	0.7201	0.9890	1.7307	0.7774	0.4746	0.6174
Cash Flow from Operations	0.0647	0.1923	0.0664	0.0720	0.1921	0.0601	0.0572	0.1926	0.0678	0.4100	0.7302
Accruals	-0.0720	0.1948	-0.0660	-0.0792	0.2026	-0.0781	-0.0645	0.1865	-0.0617	0.4172	0.6085

Table 4.1. Continued

<i>Panel B Correlation Matrices</i>									
	All			Low BLOCK			High BLOCK		
	$R_{i,t}$	Unrelated Block Ownership	Managerial Ownership	$R_{i,t}$	Unrelated Block Ownership	Managerial Ownership	$R_{i,t}$	Unrelated Block Ownership	Managerial Ownership
$E_{i,t}/P_{i,t-1}$	0.1288 (0.0052)	0.0161 (0.7288)	0.0680 (0.1417)	0.0989 (0.1282)	-0.0762 (0.2419)	0.11517 (0.0762)	0.1665 (0.0113)	0.1438 (0.0289)	0.0523 (0.4288)
$R_{i,t}$		-0.0617 (0.1823)	0.0873 (0.0589)		-0.1843 (0.0043)	0.1114 (0.0863)		0.0514 (0.4372)	0.1686 (0.0103)
Unrelated Block Ownership			-0.6806 (<0.00001)			-0.7156 (<0.0001)			-0.1918 (0.0034)

This table presents descriptive statistics of Polish listed companies in our sample. The sample includes 469 firm-year observations and spans 1999 and 2002. All observations are ranked according to unrelated block ownership into two ranks. Low BLOCK denotes companies in the first rank, with low level of unrelated block ownership, high BLOCK denotes companies in the second rank, with high level of unrelated block ownership. $R_{i,t}$ is a stock returns measured for the twelve-month period starting nine months prior to fiscal year-end through three months after the fiscal year-end for firm i in period t . $E_{i,t}$ is earnings per share calculated as earnings per share scaled by share price at the beginning of the period, for firm i in period t . Managerial ownership is the percentage of voting rights held by management. Unrelated block ownership is the percent of voting rights held by unrelated shareholders that own at least 5% of outstanding shares. Size is the natural logarithm of market value of equity. Debt is a ratio of total debt to total assets. Growth denotes market to book ratio. Cash from operations is calculated as difference between net earnings and total accruals scaled by total assets. Accruals are defined as a difference between operating income and cash flow from operations. Earnings per share, managerial ownership, unrelated block ownership, debt, cash flow from operations and accruals are calculated as at the end of financial year. Two-sided p -values are reported in parenthesis.

Control variables are essentially defined by Warfield et al. (1995) and are summarized as follows.¹⁵ Natural logarithm of the market value of equity in PLN is a proxy for firm size.¹⁶ Debt is the leverage measured as the ratio of total debt to total assets. Company growth is proxied by the market to book ratio, and is calculated as market value of equity scaled by its book value. For consistency with the definition of stock returns, to compute market value of equity we use stock prices from three months after the fiscal year-end. To investigate earnings management we include also accrual and cash flow from operations. Consistent with previous studies (Jones, 1991; Dechow, Sloan and Sweeney, 1995), the accrual for each company is calculated as a difference between earnings from operations and cash flow from operations.

Table 4.1 reports descriptive statistics and correlation matrices of the variables. Panel A presents sample means, standard deviations and medians for the full sample (All) and two subsamples: companies within Low BLOCK and High BLOCK ranks. Low (High) BLOCK companies are companies with unrelated block ownership below (above) the sample median. The statistics reported in Table 4.1 are calculated by firm-years, so that the companies that change ownership structure during the sample period may fall into another block ownership rank. The sample managerial ownership mean and median are equal to 9.75% and 0.49%, respectively. At the same time, the unrelated block owners hold on average 54.61% shares outstanding. The median of unrelated block ownership is equal to 59.08%. These figures support the dominance of concentrated ownership structure with few shareholders holding the majority

¹⁵ Variability of earnings and persistence of earnings are two more control variables commonly employed to investigate the informativeness of earnings. To calculate these variables, Warfield et al. (1995) use data for sixteen quarters, Gabrielsen et al. (2002) for at least seven years and Yeo et al. (2002) for eight years. The length of our earnings time series restricted by the short history of the WSE is inadequate to ensure reliable estimates of earnings persistence and variability in our study.

¹⁶ The average end-of-year exchange rate in the period under consideration was around 4.00 PLN/USD

of the shares outstanding in the country where legal governance system is weak (La Porta et al., 1998).

Comparison of the ownership characteristics between Low and High BLOCK ranks shows significant economic and statistical differences (p-values=0.0001). The tests for differences in means and medians between the two ranks indicate that companies within Low BLOCK rank have higher managerial ownership and, by definition, lower unrelated block ownership (17.95% and 34.82%, respectively) than companies within High BLOCK rank (1.31% and 75.14%). Companies with lower managerial ownership and higher unrelated block ownership (High BLOCK) are also statistically larger (p-values=0.0004). Nevertheless, the economic differences of size appear not to be considerably large.

Panel B of Table 4.1 shows positive and statistically significant correlation between stock returns and earnings for the full sample as well as for the high block ownership subsample. The correlation becomes insignificant in companies with low unrelated block ownership. The negative relationship between managerial ownership and unrelated block ownership, indicated by the descriptive statistics is corroborated by statistically significant correlation coefficient of -0.68 . The findings are similar to those reported by Yeo et al. (2002) for Singapore. The apparent differences in ownership structure and correlations between stock returns and earnings suggest that the information content of earnings may vary across the ranks. The effects are analysed in detail in the next section.

4.3. Methodology and Empirical Results

4.3.1. Pooled Time-Series Cross-Section Specification

A standard regression model, developed by Warfield et al., 1995 is applied to investigate the influence of managerial ownership on the information content of earnings, conditional on unrelated block ownership. The regression analysis is carried out using two approaches. First, we use simple pooled cross-section time-series model (Ordinary Least Squares) estimation. Second, we consider possible influence of endogeneity and apply two way fixed effect and instrumental variable approaches. In the next subsection, we investigate whether differences in the relationship between information content of earnings and managerial ownership across Low and High BLOCK ranks can be explained by different patterns in earnings management.

In the first step of the analysis, stock returns are regressed on a set of ownership and earnings variables (see e.g. Warfield et al., 1995; Gabrielsen et al., 2002, Yeo et al., 2002). Model (4.1) presents baseline regression, the same as those used in other studies. The model tests the effect of managerial ownership on the explanatory power of earnings on stock returns.

$$R_{i,t} = \mathbf{a}_0 + \mathbf{a}_1 E_{i,t} / P_{i,t-1} + \mathbf{a}_2 \text{ManageriaDown}_i E_{i,t} / P_{i,t-1} + \mathbf{e}_{i,t} \quad (4.1)$$

The variables are defined as previously. The coefficient \mathbf{a}_2 measures the influence of managerial ownership on the information content of earnings, and reflects the extent to which the information content is affected by managerial ownership. A positive (negative), statistically significant value of the coefficient \mathbf{a}_2 indicates a positive (negative) effect of managerial ownership on the explanatory power of earnings. To test the hypothesis that managerial ownership has a negative impact on the informativeness

of earnings in companies with low external block holdings and positive in companies with high external block holdings, two subsamples with low and high unrelated block ownership (Low and High BLOCK) are examined.

Table 4.2, Panel A presents the results of pooled regressions to explain stock returns by accounting earnings and managerial ownership. The results in column (1) for the full sample are in line with previous studies and present a positive and statistically significant (t-stat=3.45) relationship between stock returns and earnings, all else being equal (Jermakowicz and Gornik-Tomaszewski, 1998; and Gornik-Tomaszewski and Jermakowicz, 2001). However, the negative coefficient a_2 (t-stat=-2.60) suggests a strong negative influence of managerial ownership on the information content of earnings and is in line with both, our expectation and the results presented by Gabrielsen et al. (2002) for the Danish market. Columns (3) and (5) present the explanatory power of earnings and managerial ownership in two ranks: Low and High BLOCK. The effect on managerial ownership on the information content of earnings is statistically negative (t-stat=-2.72) for companies with low level of unrelated block ownership and statistically positive (t-stat=3.40) for companies with high level of unrelated block ownership. The evidence is in favour of the hypothesis that outside block owners can act as a substitute for missing governance institutions and monitor managers to increase the information content of earnings.

Various additional independent variables are introduced into regression (4.2) to ensure that the effects attributed to the ownership structure are not caused by other correlated factors, and to control for the firm's characteristics.

Table 4.2. Regression Analysis

	All		Low BLOCK		High BLOCK	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A OLS</i>						
a ₀	0.0143 (0.48)	0.0244 (0.83)	0.0128 (0.28)	0.0311 (0.67)	0.0160 (0.44)	0.0175 (0.48)
a ₁	0.0961*** (3.45)	0.3251 (0.93)	0.1171** (2.50)	1.0205* (1.79)	0.0603* (1.86)	-0.9971 (-1.40)
a ₂	-0.0118*** (-2.60)	-0.0115** (-1.97)	-0.0142*** (-2.72)	-0.0151* (-1.89)	0.1256*** (3.40)	0.0799** (2.01)
a ₃		0.0036* (1.70)		0.0051 (0.97)		-0.0019 (-0.28)
a ₄		-0.0136 (-0.49)		-0.0826* (-1.91)		0.1509*** (3.13)
a ₅		-0.2316** (-2.58)		-0.3668 (-1.42)		0.0611 (0.49)
a ₆		-0.0249 (-1.29)		-0.0196 (-0.80)		0.0138 (0.33)
Adj. R ²	0.0265	0.0485	0.0318	0.0436	0.0665	0.1158
N	469	469	238	238	231	231
<i>Panel B Two-Way Fixed Effect</i>						
a ₀	-0.1008 (-0.34)	-0.0823 (-0.28)	-0.2112 (-0.55)	-0.2065 (-0.55)	-0.1398 (-0.53)	-0.1534 (-0.58)
a ₁	0.0385 (1.07)	0.9579** (2.14)	0.0782 (1.35)	2.0318*** (2.76)	-0.0327 (-0.74)	-0.6810 (-0.70)
a ₂	-0.0222*** (-3.95)	-0.0330*** (-4.45)	-0.0263*** (-4.08)	-0.0435*** (-4.48)	0.0967** (2.55)	0.0947** (2.13)
a ₃		-0.0032 (-1.22)		-0.0066 (-1.12)		-0.0078 (-0.87)
a ₄		-0.0560 (-1.56)		-0.1117** (-2.09)		0.1266 (1.52)
a ₅		-0.2057* (-1.95)		-0.6043* (-1.86)		0.1465 (0.94)
a ₆		-0.0222 (-1.12)		-0.0285 (-1.05)		0.0095 (0.18)
Hausman Test Ho: Random Effect (p-value)	0.0007	0.0002	0.0047	0.0052	0.0039	0.0411
R ²	0.4561	0.4693	0.4766	0.5110	0.4992	0.5092
N	469	469	238	238	231	231

Table 4.2. Continued

	All		Low BLOCK		High BLOCK	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel C 2SLS</i>						
a_0	0.0150 (0.50)	0.0301 (1.00)	0.0144 (0.32)	0.0340 (0.73)	0.0150 (0.40)	0.0195 (0.52)
a_1	0.1086*** (3.36)	0.8787** (2.25)	0.1370*** (2.65)	1.4924** (2.36)	0.0398 (1.06)	-1.0932** (-2.06)
a_2	-0.0191** (-2.41)	-0.0301*** (-3.24)	-0.0199** (-2.49)	-0.0268*** (-2.95)	0.2390** (2.23)	0.0040 (0.01)
a_3						
a_4		-0.0410 (-1.30)		-0.0871* (-1.92)		0.1565*** (3.02)
a_5		-0.3180*** (-2.97)		-0.5485** (-2.08)		0.0313 (0.16)
a_6		-0.0259 (-1.33)		-0.0235 (-0.98)		0.0186 (0.43)
Adj. R^2	0.0254	0.0299	0.0270	0.0389	0.0280	0.1053
N	469	469	238	238	231	231

The table presents estimated coefficients of the following model:

$$R_{i,t} = \mathbf{a}_0 + \mathbf{a}_1 E_{i,t} / P_{i,t-1} + \mathbf{a}_2 \text{ManagerialOwn}_i E_{i,t} / P_{i,t-1} + \mathbf{a}_3 \text{UnrelatedBlockOwn}_i E_{i,t} / P_{i,t-1} \\ + \mathbf{a}_4 \text{Size}_i E_{i,t} / P_{i,t-1} + \mathbf{a}_5 \text{Debt}_{i,t} E_{i,t} / P_{i,t-1} + \mathbf{a}_6 \text{Growth}_{i,t} E_{i,t} / P_{i,t-1} + \mathbf{e}_{i,t}$$

$R_{i,t}$ is a stock return measured for the twelve-month period starting nine months prior to fiscal year-end through three months after the fiscal year-end for firm i in period t . $E_{i,t}$ is earnings per share calculated as earnings per share scaled by share price at the beginning of the period, for firm i in period t . *Managerial Ownership* is the percentage of voting rights held by management. *Unrelated Block Ownership* is the percentage of voting rights held by unrelated shareholders that own at least 5% of outstanding shares. *Size* is the natural logarithm of market value of equity. *Debt* is a ratio of total debt to total assets. *Growth* denotes market to book ratio. The analysis is carried out for the full sample (All) and two subsamples (Low BLOCK and High BLOCK). All observations are ranked according to unrelated block ownership into two ranks. Low BLOCK denotes companies in the first rank, with low level of unrelated block ownership and high level of managerial ownership, High BLOCK denotes companies in the second rank, with high level of unrelated block ownership and low level of managerial ownership. Panel A presents coefficients estimated using ordinary least squares, Panel B presents coefficients estimated using two way fixed effect, and Panel C presents coefficients estimated using two-stage least squares. The instrumental variable is *Unrelated Block Ownership*. Hausman test against the hypothesis of random effect is displayed. T-statistics values are reported in parenthesis. ***, **, and * indicate significance at 0.01, 0.05 and 0.10 levels, respectively.

$$\begin{aligned}
R_{i,t} = & \mathbf{a}_0 + \mathbf{a}_1 E_{i,t} / P_{i,t-1} + \mathbf{a}_2 \text{ManagerialOwn}_i E_{i,t} / P_{i,t-1} \\
& + \mathbf{a}_3 \text{UnrelatedBlockOwn}_i E_{i,t} / P_{i,t-1} + \mathbf{a}_4 \text{Size}_i E_{i,t} / P_{i,t-1} \\
& + \mathbf{a}_5 \text{Debt}_{i,t} E_{i,t} / P_{i,t-1} + \mathbf{a}_6 \text{Growth}_{i,t} E_{i,t} / P_{i,t-1} + \mathbf{e}_{i,t}
\end{aligned} \tag{4.2}$$

The coefficient \mathbf{a}_2 indicates the effect of managerial ownership on the information content of earnings, as in model (4.1). The results for a model (4.2) are presented in Table 4.1, Panel A, columns (2), (4), and (6). The main findings remain unchanged and exhibit a negative association between information content of earnings and managerial ownership for companies within Low BLOCK rank, and positive for companies within High BLOCK rank. Additionally, explanatory power of earnings for returns decreases in size of the company, in Low BLOCK rank and increases with the size in High BLOCK rank. The results are consistent with trends observed for Singapore by Yeo et al. (2002).

4.3.2. Fixed Effects Specification

In the next step of the analysis, we extend the approach to control for firm and time specific effects. Models (4.1) and (4.2) are estimated using two-way fixed effect specification. If the findings in the previous section are not driven by firm and time specific characteristics the results should be similar. Thus, the coefficients \mathbf{a}_2 are expected to be significantly negative for the full sample and Low BLOCK rank and significantly positive for the High BLOCK rank. Table 4.2, Panel B presents the results for fixed effects estimation and the columns correspond to those in Panel A. The results confirm negative effect of managerial ownership on the relationship between stock returns information content of accounting earnings for the Low BLOCK rank (t-stat=-4.08 and -4.48) and positive for the High BLOCK rank (t-stat=2.55 and 2.13). Consistent with previous evidence, the results for the full sample are driven

mainly by companies in the Low BLOCK rank because the coefficients \mathbf{a}_2 are significantly negative (t-stat=-3.95 and -4.45). To test for the relevance of the fixed effects we apply the Hausman test against the hypothesis of random effect. The null hypothesis is rejected at the 1 per cent significance level for all estimations in columns (1) to (5) and at 5 per cent significance level for the estimation in column (6).

4.3.3. Endogeneity and Two Stage Least Squares (2SLS) Specification

It may be inappropriate to conclude about the influence of managerial ownership and unrelated block ownership on the information content of accounting earnings without controlling for possible endogeneity. The fixed effect should mitigate this problem because it eliminates firm specific effects, but if bias is systematically related to characteristics other than firm identity then improvements may be possible. Previous literature shows that in emerging markets low levels of managerial ownership are associated with high levels of unrelated block ownership (e.g. La Porta et al., 1999) and suggests possibility of endogeneity in ownership structure. The particular issue of endogeneity of managerial ownership is also recognized. Kole (1996) discusses this matter in the light of reverse causality between performance (Tobin's Q) and the ownership. Himmelbrg, Hubbard and Palia (1999) argue that managerial ownership and performance are endogenously determined by exogenous contractual arrangements.¹⁷ In our case, if managerial ownership is correlated with unrelated block ownership the question arises of whether our findings on information content of earnings should be attributed to managerial ownership or whether they are driven by unrelated block ownership.

¹⁷ Himmelberg et al. (1999) define contractual arrangements as network of relations representing contracts for financing, capital structure, and managerial ownership and compensation, among others.

To control for potential endogeneity, models (4.1) and (4.2) are estimated using the Two Stage Least Squares (2SLS) method. If there is the endogeneity problem, the OLS results may be biased and 2SLS with properly chosen instruments can lead to more efficient estimates. This approach is commonly used in finance literature (see e.g. Leuz and Verrecchia, 2002; Leuz et al., 2003; Almeida, Campello and Weisbach, 2004). However, selection of instrumental variables is by no means an easy and obvious task. In this approach managerial ownership is considered to be endogenously determined by unrelated block ownership and we use the unrelated block ownership as an instrumental variable. For consistency both variables are multiplied by $E_{i,t}/P_{i,t-1}$.

Table 4.2, Panel C presents the results for 2SLS estimation. The coefficients of main interest α_2 remain negative and statistically significant for the full sample and Low BLOCK rank, and positively significant for High BLOCK rank, except for column (6). The results corroborate also the negative association between size and explanatory power of earnings for stock returns in the Low BLOCK rank and positive in the High BLOCK rank.

4.3.4. *Measuring Earnings Management*

One possible explanation of the differences in the impact of managerial ownership on the information content of earnings across Low and High BLOCK subsamples is different magnitude of earnings management. We define the earnings management as the modification of companies' reported accounting earnings by managers to mask company's true economic performance (Healy and Wahlen, 1999). We argue that weak corporate governance system together with poor investor protection, and low level of legal enforcement create some incentives for managers

to expropriate private benefits of control and misrepresent accounting earnings. This problem can be partly resolved by the existence of unrelated block ownership that can act as a substitute for the missing governance institutions through monitoring. Therefore, it is expected that the earnings management will be less pronounced for companies with high unrelated block ownership (High BLOCK rank).

We apply earnings management measures used by Leuz et al. (2003). First proxy, EM1 estimates the scale of earnings smoothing (Skinner and Mayers, 1999) and is represented by a Spearman correlation between changes in accounting accruals and changes in operating income (both scaled by lagged total assets). The higher the magnitude of the correlation the higher is the magnitude of earnings smoothing. Second and third proxies test whether managers use their discretion to influence reported accounting earnings. EM2 employs magnitude of accruals to measure the extent to which managers use their discretion. It is defined as a median ratio of the absolute value of accruals to the absolute value of the cash flow from operations. EM3 is a ratio of small profits to small losses and indicates the scale of earnings management to avoid reporting losses. Small losses and small profits are defined as a net income scaled by total assets and are in the range $[-0.01, 0.00)$ and $[0.00, 0.01]$, respectively. Higher values of EM2 and EM3 denote more earnings management to mask company's true economic performance.

Table 4.3 reports the earnings management measures for Low and High BLOCK ranks. The first proxy, EM1 indicates higher level of earnings smoothing in the High BLOCK rank and is statistically significant for both ranks. On the contrary, the measures focusing on managerial discretion (EM2 and EM3) reveal that earnings management is more pervasive in companies within the Low BLOCK rank.

Table 4.3. Earnings Management Measures

Earnings Management Measures	Low BLOCK	High BLOCK	Expected Relation between (1) and (2)
	(1)	(2)	
EM1	-0.7282	-0.7430	(1) < (2)
EM2	0.9133	0.8873	(1) > (2)
EM3	4.00	3.66	(1) > (2)

This table reports earnings management scores for companies in Low and High BLOCK ranks. EM1 is the rank's Spearman correlation between the change in accruals and the change in cash flow from operations (both scaled by lagged total assets). EM2 is the rank's median ratio of the absolute values of accruals and the absolute value of the cash flow from operations. EM3 is the ratio of small profits to small losses for each rank.

EM3 demonstrates that the magnitude of company's accruals relative to cash flow from operation is higher for Low BLOCK. At the same time, managers in Low BLOCK companies avoid reporting losses to the greater extent than in High BLOCK companies. The results on earnings discretion measures (EM2 and EM3) suggest that lower level of earnings management is characteristic for companies with higher unrelated block ownership. Overall, the findings on earnings management partly support the findings from regression analysis. They reveal that unrelated block ownership can help monitor managers, improve corporate governance system and thus increase the positive effect of managerial ownership on the relationship between information content of earnings and stock returns.

4.4. Sensitivity Analysis

To check the robustness of the main findings, we control for the impact of outliers, and change of the definitions of stock returns and size. The descriptive statistics reported in Table 4.1 suggest the presence of some large outliers in earnings

Table 4.4. Robustness Check (Sample without Outliers)

	All		Low BLOCK		High BLOCK	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A OLS</i>						
a ₀	0.0277 (0.94)	0.0238 (0.81)	0.0303 (0.67)	0.0343 (0.75)	0.0238 (0.65)	0.0172 (0.48)
a ₁	0.3076*** (5.48)	-0.4713 (-0.81)	0.4053*** (4.04)	-0.8357 (-0.84)	0.1786** (2.66)	-1.4325 (-1.46)
a ₂	-0.0163*** (-3.13)	-0.0159*** (-2.46)	-0.0199*** (-3.32)	-0.0080 (-0.89)	0.0978** (2.49)	0.0794** (1.99)
a ₃		0.0014 (0.39)		0.0138 (1.53)		-0.0003 (-0.04)
a ₄		0.0753* (1.77)		0.0138 (0.21)		0.1709*** (2.98)
a ₅		0.0611 (0.26)		0.6164 (1.40)		0.2533 (0.79)
a ₆		-0.0254 (-1.30)		-0.0074 (0.30)		0.0249 (0.55)
Adj. R ²	0.0615	0.0647	0.0700	0.0724	0.0812	0.1158
N	465	465	235	235	230	230
<i>Panel B Two-Way Fixed Effect</i>						
a ₀	-0.0955 (-0.33)	-0.0782 (-0.27)	-0.1972 (-0.52)	-0.1874 (-0.50)	-0.1398 (-0.53)	-0.1724 (-0.65)
a ₁	0.1800** (2.38)	0.8072 (1.01)	0.3439 (1.35)	1.6806 (1.36)	-0.0679 (-0.70)	-2.0421 (-1.38)
a ₂	-0.0309*** (-4.50)	-0.0387*** (-4.77)	-0.0375*** (-4.81)	-0.0442*** (-4.10)	0.1036** (2.49)	0.0900** (2.02)
a ₃		-0.0067 (-1.56)		-0.0100 (-0.92)		-0.0058 (-0.64)
a ₄		-0.0080 (-0.14)		-0.0827 (-1.05)		0.2195* (1.96)
a ₅		-0.1926 (-0.61)		-0.2396 (-0.39)		0.6823 (1.47)
a ₆		-0.0277 (-1.21)		-0.0250 (-0.87)		0.0371 (0.64)
Hausman Test Ho: Random Effect (p- value)	0.0002	0.0001	0.0016	0.0013	0.0026	0.0284
R ²	0.4660	0.4739	0.4996	0.5114	0.4988	0.5135
N	465	465	235	235	230	230

Table 4.4. Continued

	All		Low BLOCK		High BLOCK	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel C 2SLS</i>						
a_0	0.0283 (0.96)	0.0250 (0.85)	0.0344 (0.75)	0.03770 (0.82)	0.0215 (0.57)	0.0175 (0.47)
a_1	0.3154*** (5.09)	-0.3057 (-0.58)	0.4597*** (4.18)	0.3608 (0.43)	0.1416 (1.00)	-1.4501** (-1.99)
a_2	-0.0187* (-1.94)	-0.0205** (-2.09)	-0.0278*** (-3.17)	-0.0274*** (-3.07)	0.1516 (0.82)	0.0683 (0.25)
a_3						
a_4		0.0715* (1.67)		-0.0113 (-0.17)		0.171*** (3.01)
a_5		0.0142 (0.06)		0.2474 (0.55)		0.2504 (0.70)
a_6		-0.0260 (-1.32)		-0.0137 (-0.54)		0.0257 (0.58)
Adj. R ²	0.0611	0.0657	0.063	0.0576	0.0736	0.1194
N	465	465	235	235	230	230

The table presents estimated coefficients of the following model:

$$R_{i,t} = \mathbf{a}_0 + \mathbf{a}_1 E_{i,t} / P_{i,t-1} + \mathbf{a}_2 \text{ManagerialOwn}_i E_{i,t} / P_{i,t-1} + \mathbf{a}_3 \text{UnrelatedBlockOwn}_i E_{i,t} / P_{i,t-1} \\ + \mathbf{a}_4 \text{Size}_i E_{i,t} / P_{i,t-1} + \mathbf{a}_5 \text{Debt}_{i,t} E_{i,t} / P_{i,t-1} + \mathbf{a}_6 \text{Growth}_{i,t} E_{i,t} / P_{i,t-1} + \mathbf{e}_{i,t}$$

$R_{i,t}$ is a stock return measured for the twelve-month period starting nine months prior to fiscal year-end through three months after the fiscal year-end for firm i in period t . $E_{i,t}$ is earnings per share calculated as earnings per share scaled by share price at the beginning of the period, for firm i in period t . *Managerial Ownership* is the percentage of voting rights held by management. *Unrelated Block Ownership* is the percentage of voting rights held by unrelated shareholders that own at least 5% of outstanding shares. *Size* is the natural logarithm of market value of equity. *Debt* is a ratio of total debt to total assets. *Growth* denotes market to book ratio. Four outliers are excluded from the entire sample to examine the influence of the outliers on the results. The analysis is carried out for the full sample without outliers (All) and two subsamples (Low BLOCK and High BLOCK). All observations are ranked according to unrelated block ownership into two ranks. Low BLOCK denotes companies in the first rank, with low level of unrelated block ownership and high level of managerial ownership, High BLOCK denotes companies in the second rank, with high level of unrelated block ownership and low level of managerial ownership. Panel A presents coefficients estimated using ordinary least squares, Panel B presents coefficients estimated using two way fixed effect, and Panel C presents coefficients estimated using two-stage least squares. The instrumental variable is *Unrelated Block Ownership*. Hausman test against the hypothesis of random effect is displayed. T-statistics values are reported in parenthesis. ***, ** and * indicate significance at 0.01, 0.05 and 0.10 levels, respectively.

Table 4.5. Robustness Check (Market Adjusted Stock Returns)

	All		Low BLOCK		High BLOCK	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A OLS</i>						
a ₀	-0.0116 (-0.43)	-0.0019 (-0.07)	-0.0264 (-0.63)	-0.010 (-0.24)	0.0033 (0.10)	0.0049 (0.14)
a ₁	0.0820*** (3.19)	0.03331 (1.03)	0.0952** (2.21)	0.9736* (1.86)	0.0533* (1.76)	-0.9991 (-1.50)
a ₂	-0.0119*** (-2.82)	-0.0119** (-2.21)	-0.0139*** (-2.89)	-0.0161** (-2.21)	0.1116*** (3.35)	0.0710* (1.92)
a ₃		0.0032 (1.64)		0.0034 (0.69)		-0.0010 (-0.16)
a ₄		-0.0160 (-0.62)		-0.0742* (-1.87)		0.1427*** (3.17)
a ₅		-0.2177*** (-2.63)		-0.3411 (-1.44)		0.0604 (0.52)
a ₆		-0.0248 (-1.39)		-0.0216 (-0.97)		0.0124 (0.32)
Adj. R ²	0.0253	0.0469	0.0315	0.0428	0.0632	0.1152
N	469	469	238	238	231	231
<i>Panel B Two-Way Fixed Effect</i>						
a ₀	-0.0213 (-0.07)	-0.0033 (-0.01)	-0.1340 (-0.35)	-0.1296 (-0.35)	-0.0600 (-0.23)	-0.0734 (-0.28)
a ₁	0.0386 (1.07)	0.9631** (2.15)	0.0776 (1.34)	2.0332*** (2.27)	-0.0322 (-0.72)	-0.6859 (-0.69)
a ₂	-0.0223*** (-3.95)	-0.0330*** (-4.44)	-0.0264*** (-4.09)	-0.0434*** (-4.49)	0.0968** (2.53)	0.0934** (2.08)
a ₃		-0.0031 (-1.19)		-0.0066 (-1.11)		-0.0077 (-0.85)
a ₄		-0.0566 (-1.57)		-0.1121** (-2.11)		0.1274 (1.52)
a ₅		-0.2092** (-1.98)		-0.5056* (-1.87)		0.1431 (0.91)
a ₆		-0.0244 (-1.10)		-0.0281 (-1.04)		0.0101 (0.19)
Hausman Test Ho: Random Effect (p- value)	0.0008	0.0002	0.0058	0.0073	0.0052	0.0413
R ²	0.3596	0.3751	0.3816	0.4224	0.4117	0.4232
N	469	469	238	238	231	231

Table 4.5. Continued

	All		Low BLOCK		High BLOCK	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel C 2SLS</i>						
a_0	-0.110 (-0.40)	0.0031 (0.11)	-0.0254 (-0.61)	-0.0081 (-0.19)	0.0023 (0.06)	0.0059 (0.17)
a_1	0.0932*** (3.35)	0.8254** (2.29)	0.1075** (2.27)	1.2816** (2.22)	0.3179 (0.90)	-1.0501** (-2.13)
a_2	-0.0183** (-2.51)	-0.0284*** (-3.32)	-0.0174** (-2.38)	-0.0238*** (-2.86)	0.2347** (2.34)	0.0306 (0.12)
a_3						
a_4		-0.0404 (-1.38)		-0.0772* (-1.85)		0.1456*** (3.03)
a_5		-0.2945*** (-2.98)		0.4597* (-1.91)		0.0445 (0.25)
a_6		-0.0257 (-1.43)		-0.0242 (-1.11)		0.0150 (0.37)
Adj. R ²	0.0204	0.0298	0.0293	0.0424	0.0141	0.1145
N	469	469	238	238	231	231

The table presents estimated coefficients of the following model:

$$R_{i,t} = \mathbf{a}_0 + \mathbf{a}_1 E_{i,t} / P_{i,t-1} + \mathbf{a}_2 \text{Managerial Ownership}_{i,t} E_{i,t} / P_{i,t-1} + \mathbf{a}_3 \text{Unrelated Block Ownership}_{i,t} E_{i,t} / P_{i,t-1} \\ + \mathbf{a}_4 \text{Size}_{i,t} E_{i,t} / P_{i,t-1} + \mathbf{a}_5 \text{Debt}_{i,t} E_{i,t} / P_{i,t-1} + \mathbf{a}_6 \text{Growth}_{i,t} E_{i,t} / P_{i,t-1} + \mathbf{e}_{i,t}$$

$R_{i,t}$ is a market adjusted stock return measured for the twelve-month period starting nine months prior to fiscal year-end through three months after the fiscal year-end for firm i in period t . $E_{i,t}$ is earnings per share calculated as earnings per share scaled by share price at the beginning of the period, for firm i in period t . *Managerial Ownership* is the percentage of voting rights held by management. *Unrelated Block Ownership* is the percentage of voting rights held by unrelated shareholders that own at least 5% of outstanding shares. *Size* is the natural logarithm of market value of equity. *Debt* is a ratio of total debt to total assets. *Growth* denotes market to book ratio. The analysis is carried out for the full sample (All) and two subsamples (Low BLOCK and High BLOCK). All observations are ranked according to unrelated block ownership into two ranks. Low BLOCK denotes companies in the first rank, with low level of unrelated block ownership and high level of managerial ownership, High BLOCK denotes companies in the second rank, with high level of unrelated block ownership and low level of managerial ownership. Panel A presents coefficients estimated using ordinary least squares, Panel B presents coefficients estimated using two way fixed effect, and Panel C presents coefficients estimated using two-stage least squares. The instrumental variable is *Unrelated Block Ownership*. Hausman test against the hypothesis of random effect is displayed. T-statistics values are reported in parenthesis. ***, ** and * indicate significance at 0.01, 0.05 and 0.10 levels, respectively.

distribution. Four observations that are visibly greater in magnitude than the rest of the sample are excluded. The results are presented in Table 4.4. The main findings are generally not affected by the outliers.

The results are also not sensitive to the definition of stock returns. In addition to simple stock returns, market adjusted stock returns are tested (Table 4.5). We notice however a deterioration in two-way fixed effect estimation because the adjusted R^2 decreases and the model explains smaller proportion of variation in stock returns than when simple stock returns are applied.

Change of definition of size from market capitalization to total assets does not alter main results either. The effect of managerial ownership on the explanatory power of accounting earnings for stock returns remain unchanged for the full sample, Low and High BLOCK ranks regardless the estimation method used.

5. Conclusions

Corporate governance aims to reduce expropriation of investors by managers. This thesis addresses corporate governance issues and mechanisms in different institutional settings. In particular, it analyses two most common approaches to corporate governance: legal protection of outside investors and the role of large investors. Although most of the markets regulate protection of outside investors, the quality of the regulations and the discrepancy between the law on the books and its enforcement differ substantially across markets. All investors rely on the legal protection system; however, only large investors have significant control rights over managers.

This thesis identifies and empirically examines three corporate governance mechanisms: cross-listing in the United States, close bank-firm relationships in Germany and corporate ownership structure in an emerging market. To test the implications of these mechanisms the following questions are addressed: (i) is cross-listing in the United States an effective corporate governance mechanism reducing the profitability of insider trading? (ii) what is the influence of close bank-firm relationship on corporate investments? (iii) how does the corporate ownership structure affect the information content of accounting earnings?

First, the thesis addresses the influence of cross-listing in the United States as a corporate governance mechanism. It examines information content of insider trading in British companies that list only domestically and in those that also cross-list in the United States. In that section, we use a large dataset that includes over 13,500 observations and spans January 1999 and December 2003. The research focuses on the implications of the differences between British and US legal and regulatory systems on the profitability of insider trading. It argues that because of legal bonding,

insiders in companies cross-listed in the United States may gain significantly lower abnormal returns, as they may be less likely to trade on price sensitive information.

The results corroborate previous findings that insider trading in the United Kingdom conveys price sensitive information. Around the trades and in the post-event window, we find positive abnormal returns for purchases and negative abnormal returns for sells. Moreover, purchases follow significant stock price declines and sells follow significant stock price run ups. Most of the abnormal stock price behaviour around insider trading is observed in domestically listed companies. The information content of insider trading in cross-listed companies is relatively small. Generally, the results show that insider trading in cross-listed companies is significantly less profitable than in companies listed domestically. Our sample of companies with US listings is dominated by companies that cross-list in the United States on stock exchanges, and this way of cross-listing may improve company's visibility and reduce information asymmetry mainly due to high level of disclosure requirements, corporate governance system and law enforcement. Hence the insiders are bonded from trading on price sensitive information.

Furthermore, the investigation accounts for possible selectivity bias in the decision to cross-list. The results confirm the bonding effects in case of sells where reduced abnormal returns are observed. Surprisingly, the abnormal returns after buy trades are significantly higher in cross-listed companies than in domestically listed companies. Such findings may result from the asymmetric effect of possible expropriation by managers. The expropriation may be more severe in case of sells, when insiders cash out in the anticipation of bad news leaving the uninformed investors in long positions in losing stocks. The expropriation in case of purchases is less harmful because both insiders and outsiders gain from the stock price increase. Consequently

the bonding effect may be more pronounced for sells. The main findings corroborate the notion that a company can voluntarily strengthen protection of outside investors by cross-listing in the United States and thus renting more effective legal protection of outside investors.

In the third chapter of the thesis, the focus is placed on the unique close bank-firm relationships specific for the German corporate governance system. The German system focuses on long-term relationships between universal banks and firms, where firms are traditionally financed from private sources. In Germany, banks can influence firms through direct shareholdings, proxy voting, and representation in governing bodies as well as via debt financing commitment. Close bank ties may reduce information asymmetry and enable banks to supply more external finance to the firm and consequently foster investment. This study empirically examines the influence of close bank-firm relationships as a corporate governance mechanism on liquidity sensitivity of investment of German manufacturing firms. Our sample includes 8,277 observations over the period 1960-1997. The investigation tests whether companies with close bank-firm relationships are less sensitive in their investments to internally generated cash flows. In the analysis, two proxies of the close bank-firm relationship are used to identify companies with close bank ties: banks control rights from equity ownership and proxy-voting, and the number of house bank affiliations.

The empirical evidence shows that close bank-firm relationships reduce the firm's liquidity sensitivity of investment. Investments in firms with close bank ties are much less sensitive to internally generated cash flow than for firms without close bank ties. Investment for the groups of firms with bank control rights and with single house bank attachment are much less sensitive to internal liquidity than for groups of firms without bank control rights and with multiple house bank

attachment. As the measures of bank-firm relationships are derived from two distinct kinds of interactions, the first one is related to shareholding whereas the second one to debt financing commitment, a general conclusion can be drawn. The results support the common belief that universal banks are an important element of the German corporate governance system and close bank-firm relationships have a positive effect on the firm's investments.

The ownership structure as a corporate governance mechanism in an emerging market is studied on the Polish stock market. In particular, the thesis investigates the implication of managerial ownership and block holders on the information content of accounting earnings. The information content of accounting earnings is defined as the relationship between earnings and stock returns. We test the hypothesis that managerial ownership has a negative effect on the information content of accounting earnings in companies with low unrelated block ownership, and a positive effect in companies with high unrelated block ownership. In countries with weak corporate governance systems, poor investor protection and low level of law enforcement, unrelated block ownership can substitute the missing governance institutions. The Polish stock market with its emerging corporate governance system creates a particularly interesting institutional setting to examine the usefulness of reported accounting earnings. The study uses a unique, hand collected database of corporate ownership structure in Polish listed companies. The dataset includes 149 non-financial companies listed on the WSE and spans years 1999 and 2002.

The results support previous findings that accounting earnings have positive and significant explanatory power for stock returns and the explanatory power decreases with managerial ownership. We further test this effect in subsamples of companies with high and low level of unrelated block holdings. The results demonstrate a negative

impact of managerial ownership on the information content of earnings when the company has low unrelated block ownership, and the relationship reverses for companies with high proportion of unrelated block ownership. The findings remain unchanged after controlling for endogeneity of the ownership structure. The evidence suggests that unrelated block ownership may act as a partial substitute for missing corporate governance institutions to increase the information content of earnings.

Overall, each of the markets investigated in this thesis has a different set of corporate governance mechanisms that are proved to work efficiently in given environment. Law and its effective enforcement serve as corporate governance mechanisms in Anglo-Saxon countries. The US system is recognised as the most effective in the world and can be borrowed by foreign companies through cross-listing in the United States. In Germany, close bank-firm relationships are identified as effective corporate governance mechanism that protects investors and helps maintain long-term development and stability of the company. The concentration of corporate ownership structure is characteristic for emerging markets, including Poland, where large shareholders have the power to monitor managers and can act as a corporate governance mechanism that substitutes lacking law enforcement.

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