

# Ownership Structure and the Performance of Belgian Listed Firms\*

Malika HAMADI<sup>†</sup>

Institut de Recherches Economiques et Sociales,  
Université catholique de Louvain

This version: May 2002

## Abstract

In this study we investigate empirically the relationship between ownership structure of Belgian listed firms, and their performance measured by Tobin's Q. We focus on the management and the largest shareholders equity ownership. We use first a cross-sectional estimation from 1991 to 1996. Second, we use panel data estimation to control whether the results found cross-sectionally are not due to unobserved firm heterogeneity. The use of panel data confirms the results obtained cross-sectionally for managerial ownership, that is, the relationship between the fraction of equities held by managers and Tobin's Q is negative. However, panel data results for the relationship between largest shareholders equities ownership and Tobin's Q become positive, while it is negative cross-sectionally. These results indicate that there is firm heterogeneity which is not captured in the cross-section estimation.

JEL classification: C21; C23; D23; G32

Keywords: Corporate governance, managerial ownership, largest shareholders ownership, firm performance, Tobin's Q, cross-sectional models, panel data

---

\*I gratefully acknowledge Ronald Anderson for his helpful comments and advises. I want to thank the referee Anna d'Addio for all her comments and discussions. I am grateful to Muriel Dejemeppe and Andreas Heinen for their comments and remarks. Thanks to BBL and the Brussels Euronext for all the data I get there. The usual disclaimer applies. I am grateful for the financial support from the Belgian French Community's program 'Action de Recherches Concertée' 99/04-235.

<sup>†</sup>Institut de Recherches Economiques et Sociales, Université Catholique de Louvain, Place Montesquieu, 3, 1348 Louvain-la-Neuve, Belgium. Tel : 32.10.47.42.43, Fax: 32.10.47.39.45, E-mail : hamadi@ires.ucl.ac.be.

# 1 Introduction

This study is in the line of the agency theory literature dealing with the principal-agent problem. In this literature the separation of ownership and control creates agency costs, because of the information asymmetries between managers and shareholders. The utility functions of managers, who are in control, on one hand and shareholders on the other hand are not the same. Berle and Means (1932) raised the problem of the potential conflict of interest between managers in control and dispersed shareholders in widely held US corporations. However, this view is valid for widely held corporations, in economies with diffused ownership [Becht and Röel (1999)]. Indeed, contrarily to what is observed in the USA and UK, continental European countries are characterized by the high level of ownership concentration in the hands of a small number of shareholders, Belgium being a prime example. The conflict of interests is in this case no longer between managers and dispersed shareholders, but between large shareholders detaining effective control and the other shareholders. A number of studies have emphasized the ownership concentration and the role of large shareholders in monitoring managers and the enforcement for value maximization, instead of other mechanisms [Yarrow (1976), Aoki (1983), Leech (1987), Wruck (1989), Franks, Mayer, and Renneboog (1997), Renneboog (1996), and Yafeh and Yosha (1995)].

The study of the Belgian case add another contribution to the recent literature dealing with different aspects of corporate governance around the world [Bebchuk (1999), Becht and Röel (1999), La Porta, et al., (1997), La Porta, et al., (1999), La Porta, et al., (2000a), La Porta, et al., (2000b), and Shleifer and Vishny (1997)]. Furthermore, even if Belgium is a small economy, it is worthily to study because it reflects very well the practices of corporate governance in the majority of the continental European countries.

In this paper we are interested, firstly in the effect of managerial ownership on the firm's value, as the studies done for USA corporations [Demsetz and Lehn (1985), Morck, Shleifer and Vishny (1988) and McConnell and Servaes (1990)]. Secondly, we also aim to investigate the effect of the largest shareholders ownership on firm's value, given the high level of ownership concentration in Belgian listed firms.

Concerning the effect of managerial ownership on firm's value, Berle and Means's (1932) seminal work gave rise to a substantial body of literature. Beside the theoretical literature on the objectives and the behaviour of managers in running corporations for other shareholders, there are several other US empirical studies testing this relationship. At the European level there are not readily comparable empirical studies, on ownership structure and firm's value, to those done for US corporations. This may find its explanations in part for reasons of data availability. EGCN's<sup>1</sup> report (1997) raised the severe problem of

---

<sup>1</sup>European Corporate Governance Network.

lack of data in European countries concerning the ownership disclosure and the availability of taped data. With this study, we want to make a contribution to the empirical literature dealing with the relationship between managerial ownership and firm performance for a continental European country, using Tobin's Q as a measure of performance. Furthermore, we want to see what is the effect of the largest shareholders' ownership on firm performance.

On the theoretical side, the literature considers two hypothesis. The managerial alignment hypothesis, and the managerial entrenchment hypothesis. According to the managerial alignment hypothesis, managers have an incentive or are compelled to value maximization. The incentives that make managers align their interests to those of small shareholders are managerial equity ownership in the firm [Lewellen (1969), Jensen and Meckling (1976), and Benston (1985)]. However, managerial ownership could also have a controversial effect, which is to make them too risk-averse. Hence, the performance could be lower in firms with higher managerial equity ownership [Fama and Jensen (1983)]. In Stulz (1988) study, managers' maximization of the firm's value depends on the fraction of voting rights they have. The value of a firm, which is a takeover target, increases and as the voting rights become more concentrated in the hands of managers it decreases. If managers have fifty percent or more of voting rights in the firm, and if they always oppose a hostile takeover, the value of outside shares decreases. Hence, in the high range of management ownership there is no convergence of interests between managers and dispersed shareholders. If managers do not have an ownership interest in the firm there are other forces that compel them to value maximization<sup>2</sup>. According to the managerial entrenchment hypothesis managers are supposed to be able to make specific investments in order to increase their value to shareholders and to be costly to replace as shown in Shleifer and Vishny (1989).

On the empirical side, there are several US studies investigating empirically the issue of the relationship between ownership structure, especially managers' ownership, and firm performance. Demsetz and Lehn (1985) tested empirically the relationship between accounting profit rate of 511 US companies in 1980, and ownership concentration<sup>3</sup> and find no significant correlation<sup>4</sup>. Contrarily, Morck, Shleifer and Vishny (1988) and McConnell and Servaes (1990), using a cross-sectional specification, find a significant non-linear relationship between management ownership and performance as proxied by Tobin's Q. Morck, Shleifer and Vishny (1988) have run piecewise linear OLS regressions for 371 large industrial firms of the Fortune 500 in 1980 allowing the coefficients on

---

<sup>2</sup>This compulsion comes from the managerial labor market, [Fama (1980), Martin and McConnell (1990)], by the product market [Hart (1983)], by the monitoring of the board of directors [Fama and Jensen (1983)], or by the threat of a hostile takeover, [Marris (1963), Jensen and Ruback (1983), Scharfstein (1988)].

<sup>3</sup>Ownership concentration is measured by the percentage of shares held by the top five shareholders, the percentage of shares held by the top twenty shareholders, and by the Herfindahl index.

<sup>4</sup>They used a linear specification.

the ownership variable to change slope at 5 percent and 25 percent. Their results indicate a positive relationship between ownership and Tobin' Q in the 0 to 5 percent board ownership range, a negative relation in the 5 to 25 percent range, and a positive relation beyond on 25 percent level. In the study of McConnell and Servaes (1990) investigating the relationship between performance and insiders ownership for 1173 firms in 1976 and 1093 firms in 1986, they find a curvilinear relationship between Q and insiders ownership, Q first increases then decreases as the fraction of shares held by insiders becomes more concentrated. Conclusions of these two papers are the same concerning the fact that the relationship between insiders' ownership and Q is not linear. However, Mc Connell and Servaes (1990) were unable to replicate Morck, Shleifer and Vishny (1988) specification. A mention has to be made to the study of Leech and Leahy (1991) about UK-listed firms, where they used a linear specification of ownership concentration and found a negative linear relationship.

The contribution of our study is to investigate empirically what is the relationship between managerial ownership and firm performance, for a continental European country, given that no study has been conducted for European countries. A specificity of our study is that our estimation is for a much longer period, from 1991 to 1996. While, for Demsetz and Lenh (1985) it was only for one period, for Morck, Shleifer and Vishny (1988) it was for three periods, and for McConnell and Servaes (1990) it was for two periods. Another difference between our study and the American ones, is that these studies use cross-sectional estimation. Whereas, in our study we first use cross-sectional estimation, and then panel data model to see whether there is firm heterogeneity, which is not captured cross-sectionally. Himmelberg et al. (1999), presented empirical evidence, showing that the cross-sectional results in Morck et al., (1988) and Mc Connell and Servaes (1990) are due to a spurious correlation, because of unobserved firm effects. Himmelberg et al. (1999), use panel data to show that there are firm fixed effects that are not captured in the cross-sectional specification. Other studies used panel data specifications to show the limits of cross-sectional estimations [Börsch and Köke (2000)]. This study makes a contribution given that the characteristics of corporate ownership traditions are completely different in USA and in Europe. The fact that the features of corporate ownership traditions are different in USA and Europe has been highlighted recently by the literature on corporate governance and law. La Porta et al., (1999) identify the ultimate controlling shareholders of large corporations in 27 wealthy economies. They show that dispersed ownership is far from universal, and that widely held corporations appears to be relatively uncommon, except in economies with very good shareholder protection. In contrast, family control<sup>5</sup> is very common, particularly through the use of pyramids. This control is significant and typically unchallenged by other equity holders. They find empirical evidence that com-

---

<sup>5</sup>They used 20 percent of equity ownership as the criterion for control for a sample of the 20 largest firms (by stock market capitalization of equity at the end of 1995) in 27 countries. There is more ownership concentration when they soften the control to 10 percent control chain.

mon law countries tend to have better protection of minority shareholders than civil law countries. Burkart et al., (1997) emphasize the link between ownership concentration and the weak legal protection of small shareholders. In the case of weak legal protection the large shareholder has more incentives to monitor, because there is a greater expropriation threat. This in turn reduces the manager's incentive to exert effort because he is less likely to extract (large) private benefits. When monitoring is successful, the large shareholder decides whether to pay out proceeds or whether to divert resources and share the private benefits with the manager. In Pagano and Röell (1998), the large shareholders who detain effective control are controlled by other large shareholders. However, the empirical results<sup>6</sup> of La Porta et al., (1999) do not support Pagano and Röell (1998) hypothesis that controlling shareholders are usually monitored by other large shareholders. Large shareholders of all kinds, including families are typically alone<sup>7</sup>.

Given the high level of ownership concentration in Belgian listed firms, we consider also the effect of the largest shareholders' ownership on firm performance. We estimate this relationship cross-sectionally as well as in panel data. In this regard we differ from the studies done for the US, which were interested in the effect of the control exercised by managers on performance and ignored the effect of the control exercised by the largest shareholders. In this study we present more evidence on corporate ownership in a continental European country.

The paper is organized as follows. In section two, we expose the main features of corporate ownership in Belgium. Section three, presents the empirical methodology used. In section four, we present Tobin's Q as a measure of performance and discuss the method to compute it. In section five, we describe the data. In section six we present our empirical results, and section seven concludes.

## 2 Belgian Corporate Ownership

In this section we aim to point out first, special characteristics of Belgian corporate ownership. Second, we want to focus on the adoption, in 1989, of the disclosure law, because before this date, no information was available about the composition of shareholders of Belgian listed firms.

### 2.1 Main Features

The Anglo-Saxon corporate system is characterized as oriented toward outside investors<sup>8</sup>, and is based on common law traditions, where the ownership

---

<sup>6</sup>For 27 wealthy economies including Belgium.

<sup>7</sup>In 75% of the cases the controlling large shareholder does not have another large shareholder in the same firm.

<sup>8</sup>Franks and Mayer (1995) classify the ownership structures in outside and inside systems.

is dispersed; the number of listed firms is large with few companies related by pyramids, the market is liquid and there is a market for corporate control disciplining bad management. In contrast, the corporate sector in continental Europe is characterized by civil law traditions, and is oriented towards inside investors, with a small number of listed companies compared to the size of the economy; the ownership is more concentrated and complex with pyramidal structures, and the firms are linked by cross shareholding. These interlocked companies deter any attempt of hostile takeovers by outsiders [Crama et al, (1999)]. Belgian corporations appear to fit this model well. In particular, they are characterized by the concentration of ownership<sup>9</sup>, the illiquidity of the equity market with a small number of listed companies. It was shown in Becht's (1999) empirical analysis for German and Belgian stock markets, that the voting power concentration through blocks has a negative effect on market liquidity. Other characteristics are the weakness of the market for corporate control<sup>10</sup>, and the prominence of holding companies or family groups with a high degree of interlocked firms, which are used to lever control via an indirect and complex structure of pyramids. Wymeersch (1994) argued that the most important reason for the use of pyramids in Belgium is leverage (see Renneboog (1996, 1997), for an overview). In addition we should note the presence of the voting blocks in listed companies, that is blocks of shareholders who declare that they are acting in concert.

Another feature of Belgian corporations is the linkage of many firms to the coordination-centers, for tax advantages. For example the members of a group which are related to a coordination-center can borrow from it (or it can be used to transfer funds from one member to another) with a significant tax advantage, compared to borrowing from a financial intermediary. To illustrate this mode of financing we borrow an example used by Deloof and Verschuren (1999). Assume that we have two firms (firm 1 and firm 2) which are members of a group. Firm 1 can invest either borrowed or internal funds in the coordination-center. Then the coordination-center lends these funds to firm 2. When firm 2 pays the interest expenses to the coordination-center, these costs are deduced from her tax base, and the coordination-center does not have to pay taxes on its interest income (which comes from firm 2). At the end of this chain, the dividends paid by the coordination-center to the investing firm 1 are almost tax-exempt.

The many differences in the nature of corporate ownership in the anglo-Saxon countries and continental European countries suggest that our results may be different from those found for U.S. firms.

---

<sup>9</sup>This constatation is also presented in the conclusion of the ECGN's work on blockholdings in Europe, where it is stated that the voting power is highly concentrated in continental Europe (see for instance Becht and Röell (1999)).

<sup>10</sup>This does not mean that there is no discipline of bad managers, but the takeover is very hard to implement especially after the adoption of the "Royal Decree" in 1989. [see for instance Renneboog (2000), and Dherment-Frère et al, (2001)].

## 2.2 Disclosure Law

Prior to 1989 little was known about the Belgian corporate ownership and the identity of shareholders. It is after the takeover of one of the largest Belgian groups, "la Société Générale de Belgique" that the Belgian ownership disclosure law was adopted. In 1988, there was a takeover battle between the French "Compagnie Financière de Suez" and the Benedetti group for the ownership of the "Société Générale de Belgique". The initial bid by the Italian Carlo de Benedetti failed, and ultimately the company was bought by the French "Companie de Suez". The consequence of this takeover was to put control of a large percentage of the Belgian economy in the hands of non-Belgian interests (Wymeersch, 1994)<sup>11</sup>. The 1989 disclosure law makes notification, to the Banking Commission, mandatory for all shareholding of 5 percent<sup>12</sup> or multiples of 5 percent. The notification threshold may be as low as 3 percent if the company writes this into its statutes. However, there are exceptions where voting blocks below the 5 percent(or 3 percent) threshold lead to notification. First, if the owners previously had an ownership of 5 percent, or more, and reduced it below 5 percent. Second, the notification takes into account stocks and warrants. If the investor holds for example 1 percent of equities and 4 percent of warrants, he must notify the company. Third, when a shareholder leaves a voting pact, he is required to register this change.

The law applies to the direct owners of the voting rights, as well as to those investors who control voting rights indirectly via a pyramidal structure of intermediate companies. Investors are obliged to reveal whether they are affiliated to a group of companies or whether they act in concert with other investors. All the dispositions taken by this law reinforce the position of controlling shareholders who are in most cases minority controlling shareholders. Furthermore, the takeover bids were strictly regulated by the Royal Decree of 8<sup>th</sup> November 1989, reducing the possibility of takeovers as a means to disciplining bad managers.

Another disposition taken by this law is that when the stake of an investor (or of the investors belonging to the same investor group) reaches 20 percent of the voting rights of the company, the strategic policy with regard to the target has to be declared to the banking commission and the target. A supermajority of 75 percent of the voting rights at the general assembly is needed to make decisions about changes in the acts of incorporation, increases of the equity capital, limitations or changes in the preferential rights of existing shareholders to purchase shares in new equity issues, changes in the rights of different classes of shareholders, repurchases of shares, and changes in the legal form of the corporation.

---

<sup>11</sup>30 percent according some sources (Wymeersch, 1994).

<sup>12</sup>This is the case in most other European countries, but in Italy it is 2 percent.

The disclosure law of 1989 was supplemented by the law of 18<sup>th</sup> June 1991, which gives more protection to the controlling shareholders. They obtained instruments to entrench their position and protect themselves from hostile takeover. "These instruments are based on a reinforcement of their shareholder position, without imposing the acquisition of a full majority."<sup>13</sup> Also, with this law minority shareholders or a group of minority shareholders owning at least 1% of shares with a value of not less than BEF 50 million, can appoint one or more experts who can scrutinize the company's accounting and its internal operations. Shareholders owning at least 1% of the votes can initiate a minority claim against the directors for the benefit of the company, if it can be proven that the company's managers have managed it poorly and if the minority shareholders have voted against the directors' discharge at the annual meeting.

### 3 Empirical Methodology

In our estimation we regress Tobin's Q, as a measure of performance, on ownership variables and a number of control variables. In a first estimation the ownership variable consists in managerial ownership variable, and in a second estimation of the largest shareholders ownership variable. We focus on these two ownership variables in order to see what would be the effect of managers' as well as the largest's shareholders ownership on performance. The use of the largest shareholders' ownership is motivated by a distinguishing feature of Belgian listed firms, i.e. the high level of ownership concentration. A more detailed definition of ownership variables is given in section six. The control variables consist of:

*The log of the replacement cost (LORC)*, a proxy for size.

*Financial Fixed Assets (FARC)*, it is the investment in the fixed financial assets divided by the replacement cost to be compatible with Q. This variable is introduced because of the high proportion of the financial fixed assets in the Belgian listed firms' balance sheet.

*Long term debts (DBRC)*, the long term debt divided by the replacement cost to be compatible with Q.

*Research and development (RDRC)*, Research and development expenses divided by the replacement cost to be compatible with Q.

*Coordinate Centres (CC)*, it is a dummy variable that takes 1 if the firm is related to a coordinate center and 0 otherwise. A firm which is linked to a coordinate-center could benefit from a high range of tax advantages.

Following the empirical studies done for U.S. corporations [Morck, et al. (1988), and McConnell and Servaes (1990) among others], we use a cross-sectional model to estimate the relationship between firms' performance and their ownership structure (management ownership and the largest shareholders' ownership). In a second step, we use panel data to test the robustness of

---

<sup>13</sup>Wymeersch (1994).



the results obtained cross-sectionally, and to check whether the model is not misspecified.

Several criticisms were formulated against the cross-sectional models used in most all US empirical studies to estimate the relationship between firms' performance and ownership structure. Himmelberg et al. (1999) used panel data, that allowed them to estimate the importance of unobserved (time-invariant) firm effects. They use the same specifications as in Morck, et al. (1988) and McConnell and Servaes (1990). Their results show that a large fraction of the cross-sectional variation in managerial ownership is explained by unobserved firm heterogeneity. This unobserved heterogeneity generates a spurious correlation between ownership and performance. They apply instrumental variables estimation as an alternative to fixed effects to control for the endogeneity of managerial ownership in the Q regression. Their results confirm a large and statistically significant inverse-U relation between ownership and firm value. However, they recognize the weakness of the instrumental variables used. Short (1994) presented a survey of the literature on the effect of the ownership composition on performance. She argued that the potential effects of the structure of ownership of the firm cannot be assessed in a comprehensive manner without taking into account the financial structures of the firm, especially the debt structure. Concerning the econometric models she concluded that although the cross-sectional analysis are useful, they cannot capture the dynamic of the relationship between ownership structure and performance. In order to track this relationship over time, she suggested the use of panel data sets.

Börsch and Köke (2000) treat the econometric problems present in empirical corporate governance studies. They show, that the use of cross-sectional data does not allow to correct for unobserved firm heterogeneity. First, they stress on the fact, that there would be structural reverse causality and unobserved firm heterogeneity. To deal with this problem, they propose the use of panel data which are necessary for the identification of any singular corporate governance mechanism. Panel data can provide for instruments that are not available in cross-sectional data. Second, they discuss the problem of missing variables due to data availability or lack of knowledge about functional forms. The third problem is the sample selectivity, when we take into account, for example, only the largest firms which could bias the results. And fourth, the measurement error in variables.

In this study we first use cross-sectional estimation from 1991 to 1996. The model estimated cross-sectionally is:

$$q_{it} = \alpha + \beta x_i + \epsilon_i \tag{1}$$

where  $q_{it}$  is the measure of performance, i.e. Tobin's Q.

$x_i$  includes in our first estimation managerial ownership variables and the  $x$  control variables defined above. In a second estimation it includes the largest shareholders ownership variables and the  $x$  control variables.

$\epsilon_i$  is the error term, assumed to be uncorrelated with  $x_i$ .

In a second step, we use panel data estimation to control whether the results found cross-sectionally are not due to unobserved firm heterogeneity which is not captured cross-sectionally. The advantage of a panel data set over cross-section ones is that it allows greater flexibility in modelling differences in behavior across individuals. Furthermore, it makes it possible to explain why a given unit behaves differently at different time<sup>14</sup>. We estimate the same model as in (1) but in panel data as:

$$q_{it} = \alpha_i + \beta x_{it} + \epsilon_{it}, \quad (2)$$

where  $x_{it}$  includes ownership variables (either managerial ownership variables or largest shareholders ownership variables) and the  $x$  control variables defined above.

$\alpha_i$  is the individual effect, which is constant over time  $t$  and specific to the individual cross-sectional unit  $i$ . It captures the effects of those variables that are specific to the  $i$ -th firm and are constant over time.

When we consider the  $\alpha_i$  as  $N$  fixed unknown parameters, the model in (2) is referred to as a fixed effects model. In the fixed effects model, the intercept terms vary over the individual firms  $i$ .  $\alpha_i$  may be correlated with  $x_{it}$ .

where  $\epsilon_{it} \sim IID(0, \sigma_\epsilon^2)$ . With the assumption that all  $x_{it}$  are independent of all  $\epsilon_{it}$ .

When we assume that  $\alpha_i$  are *IID* random factors we can write the random effects model as:

$$q_{it} = \mu + \beta x_{it} + \alpha_i + \epsilon_{it} \quad (3)$$

Where  $(\alpha_i + \epsilon_{it})$  is the error term consisting of two components:

$\alpha_i \sim IID(0, \sigma_\alpha^2)$ . It is an individual specific component, that does not vary over time.

$\epsilon_{it} \sim IID(0, \sigma_\epsilon^2)$ . It is  $\epsilon_{it}$  is a remainder component, that is assumed to be uncorrelated over time.

This means that all correlation of the error terms over time is attributed to the individual effects  $\alpha_i$ .

It is assumed that  $\alpha_i$  and  $\epsilon_{it}$  are mutually independent and independent of  $x_{js}$  (for all  $j$  and  $s$ ). This implies that the OLS estimator for  $\mu$  and  $\beta$  from (3) is unbiased and consistent. The error components structure implies that

---

<sup>14</sup>See Greene (1997) and Verbeek (2000).

the composite error term  $\alpha_i + \epsilon_{it}$  exhibits a particular form of autocorrelation (unless  $\sigma_\alpha^2 = 0$ ).

In order to choose between firm fixed effects or random effects, we rely on the Hausman statistic and the Lagrange Multiplier statistic.

**Hausman Statistic:** Hausman (1978) considers a test for the null hypothesis that  $x_{it}$  and  $\alpha_i$  are uncorrelated. The Hausman test consists in comparing two estimators. The fixed effects estimator  $\hat{\beta}_{FE}$  which is consistent for  $\beta$  irrespective of the question whether  $x_{it}$  and  $\alpha_i$  are uncorrelated, while the random effects estimator  $\hat{\beta}_{RE}$  is consistent and efficient only if  $x_{it}$  and  $\alpha_i$  are not correlated.

The test for the null hypothesis of independent  $\alpha_i$ 's is to consider the difference between the two estimators  $\hat{q} = \hat{\beta}_{FE} - \hat{\beta}_{RE}$ . With no misspecification,  $\hat{q}$  should be near zero.

Using the lemma in Hausman (1978),  $V(\hat{q}) = V(\hat{\beta}_{FE}) - V(\hat{\beta}_{RE})$

consequently, the Hausman test statistic is:

$$\zeta_H = (\hat{\beta}_{FE} - \hat{\beta}_{RE})' [\hat{V}(\hat{\beta}_{FE}) - \hat{V}(\hat{\beta}_{RE})]^{-1} (\hat{\beta}_{FE} - \hat{\beta}_{RE})$$

where  $\hat{V}$  s denote estimates of the true covariance matrices.

If the random effects model is correct the two estimates should be near each other. An important reason why the two estimators would be different is the existence of correlation between  $x_{it}$  and  $\alpha_i$ .

Under the null hypothesis, the statistic  $\zeta_H$  has an asymptotic  $\chi^2(K)$  distribution, where  $K$  is the number of elements in  $\beta$ .

**Lagrange Multiplier Statistic:** Breusch and Pagan (1980) have derived a Lagrange Multiplier test for the random effects model based on the OLS residuals. Under the null hypothesis  $\sigma_\alpha^2 = 0$  (the alternative hypothesis is  $\sigma_\alpha^2 \neq 0$ ).

The Lagrange Multiplier test is:

$$LM = \frac{NT}{2(T-1)} \left[ \frac{\sum_{i=1}^N \left[ \sum_{t=1}^T e_{it} \right]^2}{\sum_{i=1}^N \sum_{t=1}^T e_{it}^2} - 1 \right]^2$$

Under the null hypothesis, LM is distributed as  $\chi^2(1)$ .

Using the Hausman and LM statistic, we can consider which model is more suitable to estimate, and which one is misspecified. As we are interested in the effect of management and largest shareholders' equity ownership on firms' performance, we run first, an OLS regression of management ownership on Q. Second, we run the same regression with the largest shareholders ownership. This is done cross-sectionally, and afterwards in panel. In the panel data estimation we run a pooled OLS regression, then depending on the outcome of the Hausman and Lagrange Multiplier statistics, we allow for fixed effects or random effects.

## 4 Measure of Performance: Tobin's Q

In our study we use Tobin's Q as a measure of the Belgian listed firms' performance. Lindenberg & Ross (1981) stressed that *"financial price data provide a viewing window into the firm through the market's valuation of the securities issued by the firm and the changes in these values over time. Accounting data, on the other hand, provide information on the resources used by the firms"*<sup>15</sup>. The comparison between the two offers the opportunity to examine performance. Our study is innovative at the Belgian and European level. Indeed, to our knowledge, no study before computed Tobin's Q at firm level neither in Belgium nor elsewhere in Europe, except one [Dherment-Frère et al, (2001)] but they used the ratio of the market value to the total assets without correcting the historical values at their replacement costs. This is quite surprising given the number of U.S. studies, which used this measure at the firm level.

Lindenberg & Ross (1981) were the precursors in the computation of Tobin's Q at firm level. They developed a method to compute Tobin's Q and took it as a measure of bound for monopoly rents. More details on the method they used are provided in their paper. Their task was somewhat easier than us, because of the availability of data on US listed firms, especially concerning the replacement cost which was available from 1976 to 1986. In 1976 the SEC required large companies to disclose replacement cost data. For periods prior to 1976 Lindenberg & Ross developed a recursive model. Authors interested in the measure of firm performance and/or monopoly rents and power of firms followed Lindenberg & Ross computation. In general the method is modified in order to facilitate computations, according to the availability of data.

Perfect & Wiles (1994) explore the Lindenberg & Ross (1981) framework by comparing five methods of Q computation. They developed a method which they called L&R modified method to avoid some difficulties with data availability.

Tobin's Q is defined as:

$$\text{Tobin's Q} = \frac{\text{Market Value of the Firm}}{\text{Replacement Cost of Firm assets}}$$

To compute values of Tobin's Q we have to calculate the two components of the fraction, the market value and the replacement cost.

---

<sup>15</sup>Lindenberg and Ross (1981), p1.

## 4.1 The Market Value (MV)

The market value is the sum of the common stocks, preferred stocks and long term debts.

The common stocks are the recorded year end value of the firm's common stocks, provided from the Brussels stock exchange. We follow Lang, Stulz, and Walking (1989) in using the preferred stocks at their book value. In our sample there are only three firms which have preferred stocks (Recticel, Cockerill-Sambre and Her-Fic).

In this study the long term debts are at their book value. Gheysens et al. (1979) in a comparison of the nominal value of a sample of Belgian outstanding bonds at their market value, show that there is no significant difference between the two. This suggests that it may not be unreasonable to use the nominal value of debt as a proxy for the market value. For long term bonds, Lang et al. (1989), took the prices of long term bonds obtained from Moody's Bond Record and Standard and Poor's Bond Guide when it is available, and the book value otherwise. If the price of a non convertible bond is not reported, the yield to maturity and coupon rate issued by the same firm are used to calculate the price of the bond. Bonds with a remaining maturity of less than one year, short-term bonds, and debt with an unknown coupon and/or maturity date are valued at book value. Anyway, it was impossible for us to distinguish in the firms' balance sheet (from the NBB<sup>16</sup> CD ROM's) the bonds from long term debts.

## 4.2 The Replacement Cost (RC)

The assets of a firm are of three categories: plant and equipment, inventories, and other assets.

As in Lindenberg & Ross (1981) the replacement cost is:

$$RC_t = TA_t + RNP_t - HNP_t + RINV_t - HINV_t$$

Where:

$TA_t$  : Total assets in year t

$RNP_t$  : Net plant at replacement cost in year t

$HNP_t$  : Net plant at historical value in year t

$RINV_t$  : Inventories at replacement cost in year t

$HINV_t$  : Inventories at historical value in year t

### **The value of inventories in Lindenberg and Ross (1981)**

Depends upon the accounting methods used by the firm to evaluate its inventories.

---

<sup>16</sup>National Bank of Belgium.

*Last In , First Out.* Under this method the last items purchased are assumed to be the first ones sold. This method underestimates the replacement cost of inventory in inflationary periods. The formula used by L&R (1981) provides an inflation-adjusted estimate of the firm's inventory replacement cost:

$$RINV_t = RINV_{t-1} \left( \frac{P_t}{P_{t-1}} \right) + (HINV_t - HINV_{t-1}) \left[ \frac{0.5(P_t + P_{t-1})}{P_{t-1}} \right]$$

Where  $p_t$  is the wholesales price index reported in the Business Conditions Digest.

*First In, First Out.* This method implies that the first inventories items are sold first. Inventories are carried on the firm's books at the most recent prices. A reasonable approximation is given by:

$$RINV_t = HINV_t$$

*Average Cost Method.* The inventories reported at time  $t$  is approximately equal to the average of the prices at  $t-1$  and  $t$ . The approximation in this case is:

$$RINV_t = HINV_t \left[ \frac{2P_t}{(P_t + P_{t-1})} \right]$$

*Retail Cost Method.* Inventories are valued at the expected retail prices.

$$RINV_t = HINV_t (\text{Wholesale Price Index} / \text{Retail Price Index})$$

Because of the difficulty of obtaining complete information about the method used by each Belgian listed firm to evaluate its inventories, we assume that the  $RINV_t$  is equal to  $HINV_t$ , so in our framework the  $RC_t$  becomes:

$$RC_t = TA_t + RNP_t - HNP_t$$

$TA_t$  is obtained from the balance sheet of each firm ,  
 $HNP_t$  is obtained from the balance sheet of each firm ,  
 $RNP_t$  is computed.

**The Net Plant value:**

$$RNP_t = RNP_{t-1} \left[ \frac{1+\phi_t}{(1+\delta_t)(1+\theta_t)} \right] + I_t$$

$RNP_t$  in L&R is:

$$\text{RNP}_t = \text{RNP}_{t-1} \left[ \frac{1+\phi_t}{(1+\delta_t)} \right] + I_t$$

$\theta_t$  : is the year rate of cost-reducing technical progress. We assume that:  
 $\theta_t = 0$

Perfect & Willes (1994), Lang, Stulz, and Walking (1989), Lang and Litzenberg (1989), Smirlock, Gilligan, and Marshall (1984) assumed that the rate of cost-reducing technical progress equal to zero.

$$\delta_t = \frac{\text{Book Depreciation of year } t}{\text{HNP}_{t-1}}$$

$\phi_t$  is the investment deflator calculated from data available from the Federal Planning Bureau.

For the first period we consider  $\text{RNP}_{t-1}$  equal to  $\text{HNP}_t$  as in Perfect and Willes (1994) .

$I_t$  is the new investment in plant and equipment in year  $t$ .

In Table 2, in the appendix, we have descriptive statistics of  $Q$  for all listed firms (except insurance companies, banks and some firms in coal and mining, which are not included in our sample) for which we have all available data.

## 5 Data Sources

Our data consists of all firms that satisfy the following criteria:

1. Belgian listed firms except banks and insurance companies.
2. Belgian listed firms for which the balance sheet data is available in the data set of the National Bank of Belgium.
3. Belgian listed firms for which ownership data is available in annual reports, (or in the notifications that are available in the Documentation and Statistics Department at the Brussels Stock exchange) with at least one shareholder beyond the 5% (or 3%) declaration threshold.

### 5.1 Ownership data

As we saw in the previous section, before 1989 there is no ownership data available and little was known about Belgian corporate ownership. Since the disclosure law in 1989, large shareholder ownership is reported to the Banking Commission and is reported in the companies' annual reports. However, there is no taped database which allows a direct use of this data. This was the main difficulty of this study.

Our data sample consists of all Belgian non financial companies listed on the Brussels Stock Exchange, for which financial data is available in the data set mentioned by the National Bank of Belgium. It should be noted that this excludes some companies in coal mining and steel production. These firms were involved in a long liquidation process during which they were still listed. To summarize, our sample consists of all listed firms with available ownership data and accounting data from NBB CD-ROMs making it possible to compute Tobin's Q. In some other cases there are firms with no declaration about their ownership structure because there is no shareholder who has more than 5 percent (or 3 percent) of equity shares. Other firms are mentioned on the CD-ROMs but there is no data reported in their balance sheets. The sample was more reduced in 1989 and 1990 because of firms which benefited from a "grace period". Indeed, in the disclosure law of 1989, there is a disposition for some firms which were not obliged to do any declaration at the end of 1989. These firms are those which enjoyed a "grace period" for two years (1989 and 1990), but by the end of 1991 they were obliged to do such declarations. The condition for the firm to enjoy the "grace period" is to have less than BEF 250000000 equity capital at the time the legislation came into effect. In order to have a more complete sample, we began our empirical estimations in 1991.

Direct ownership data was collected from the annual reports of listed firms and we complete this by information available in BBL and notifications available in the Documentation and Statistics Department of the Brussels Stock Exchange. In the Documentation and Statistics Department there exists an updated database called BDPart. However when there is a change in the ownership composition, the previous data is overwritten. Therefore this database does not allow a study on historical data. To have all historical ownership positions it is necessary to complete them manually, from annual reports. We should note that there exists a database provided by the NBB in the annual accounts CD-ROMs. However, this data is incomplete. Only Belgian shareholders are reported. If there are foreign shareholders, there is no indication about them. Furthermore a comparison of the printed annual reports and CD-ROMs revealed that the portfolio information is frequently faulty<sup>17</sup>. We should also note that the ECGN report of the European Commission (1997) addresses the main difficulties in obtaining ownership and/or control information. Although the EU Transparency Directive (88/627/EEC), the 1<sup>st</sup>, 2<sup>nd</sup>, 4<sup>th</sup>, and 8<sup>th</sup> company Directives, the Financial Institutions and Bank Accounting Directive (91/674/EEC) were adopted in order to harmonize the disclosure standards in the EU and to make the information available. The collection of data remains difficult and there is little alternative to construct the data set manually as we have done in this study. Table 1, in the appendix, reports the number of firms included in our sample and those excluded.

---

<sup>17</sup>See for example the ECGN report to the European Commission (1997).



## 5.2 Data Sources for the Computation of Tobin's Q

Our data sources to compute Tobin's Q are:

1. The CD-ROMs' edited by the National Bank of Belgium (NBB).
2. Brussels Stock Exchange.
3. Federal Planning Bureau.

To compute Tobin's Q we combine data from firms' balance sheets and data concerning the market value of firms. For data from balance sheets we use the NBB CD-ROM's which provides us with data concerning total assets, historical value of plants, the book depreciation of plants, and the long term debt. There are some firms which are recorded on the CD-ROMs but no data is available about them; these firms are excluded.

The data needed to calculate the market value was collected from the Brussels Stock Exchange, where we have the year end market capitalization of common stocks and preferred stocks if there are any.

From the Federal Planning Bureau we obtained data to calculate the investment deflator.

## 6 Empirical Results

First we consider, the management direct ownership. Second, we look at the largest shareholders' (or voting blocks) direct ownership in order to check the effect of ownership concentration on firm performance. Finally, we consider the second largest shareholders' (or voting blocks) direct ownership.

### 6.1 The Management Ownership

To define the managerial ownership variable, we have to take into account how the different shareholders of a firm vote. In Belgian listed firms the shareholding could be of independent shareholders, that is direct stakes, or group blocks which represent the stakes of companies that are part of a business group that is subject to consolidation rules under Belgian law. Hence, an investor could be an individual or an investor who is a member of a voting pact. Managers also could have an individual direct shareholding in the firm as they could be members of a voting pact, and they declare that they are acting in concert with other shareholders. Because of the existence of voting pacts, we define the management ownership variable (the variable INS in our regression estimation) as the share of common stocks owned by the manager if he does not declare that he acts in concert with others. If the manager declares that he acts in concert

with other shareholders, INS is the sum of the manager's common stocks and the common stocks held by the other shareholder(s) in the same voting pact.

The motivation for this definition, is that the manager who is a member of a voting pact is linked to the other members. There will be an influence, either by him on the other voting pact's members, as he could be influenced by them, because there is an arrangement to vote together. If we take only the manager's equity ownership, we are assuming that only his ownership has an effect on decisions made. But this is not true because when he votes, it is not only his ownership which is considered, but the ownership of all the members of the voting pact to which he belongs. Descriptive statistics on management ownership are in Table 3, in the appendix.

As mentioned above, we use first a cross-sectional estimation to see the predictable effects of the ownership structure of a firm on its value, following the empirical literature [McConnel and Servaes (1990), and Morck et al., (1988) for instance]. We estimate an ordinary least square regression of Tobin's Q on management ownership. Results are shown in Table 8, in the appendix. In this table INS is the percentage of the equity shares held by insiders as defined above. Second, we use panel data to estimate the same relationship, in order to check whether the previous results are not spurious and due to firm heterogeneity.

Cross-sectionally, the results shown in Table 8, indicate a negative relationship between management ownership and firm value. The results are statistically significant for all periods except for 1991 and 1996 where they are less significant. For 1991 the level of significance is 8% , and in 1996 it is 12%. This inverse relationship between Tobin's Q and managers ownership is consistent with the management entrenchment hypothesis, and indicates that in Belgian listed companies, there is no convergence of interest between managers and other shareholders. Our results are consistent with the recent literature on corporate governance and law where it is reported that weak legal shareholder protection affects the ease with which the manager, possibly in collusion with the large shareholders can divert corporate resources [Burkart et al., (1997)]. In our sample, managers are in many cases part of voting blocks, which suggests, that there could be a collusion between them to expropriate minority shareholders. The lack of the liquidity of the capital market weakens the market for corporate control in Belgium, hence weakens the discipline of bad managers by the market. Becht (1999) showed that the high level of ownership concentration has a negative effect on market liquidity. In the Belgian case, this is reinforced by the disclosure law and the regulation of takeover bids after the takeover of "la Société Générale de Belgique" which have further reduced the effectiveness of takeovers as a mechanism of corporate control and management discipline, as mentioned in previous sections. The lack of a real threat from the market of corporate control<sup>18</sup> helps managerial discretion<sup>19</sup>.

<sup>18</sup>With regard to changes in takeover procedures brought by the Royale Decree of 08/11/89.

<sup>19</sup>This does not mean that there is no discipline of managers [Renneboog(2000) for instance].

We now introduce the control variables, defined in previous sections, which could capture some features in the firms' contracting environment as well as special features of Belgian corporate ownership. The results, are no longer statistically significant in the cross-sectional estimation. The coefficient on managerial ownership is still negative but not statistically significant. This suggests that there is a correlation between the error term and these explanatory variables.

To control for firm heterogeneity we use panel data. The results in columns one and two of Table 11, in the appendix, show a negative relationship between managerial ownership and firm value in the pooled form, and also with random and firm fixed effects (the firm fixed effects results are not reported in this table). According to the Hausman statistic, random effects have to be included. The sign of the management ownership coefficient is negative and statistically significant.

Columns three and four of Table 11 report the results of the regression of managerial ownership, other control variables, and year dummies (not reported) on firms' value. The LM and Hausman statistical tests reject random effects model in favor of fixed effects model. In the estimation with firm fixed effects, the coefficient on ownership is negative but not significant, and for the other control variables there is only the coefficient on size which is negative and statistically significant. In the specification with firm fixed effects we did not introduce the dummy variable of coordinate-center, because it is time invariant. These results could be explained by the fact that there could be other unobserved variables, in the Belgian context, which interact with the management ownership variable and are not introduced here.

Some Belgian corporate ownership characteristics have to be considered to get sufficient conclusions about the results obtained. In the Belgian case it could be that it is not only ownership variables that make managers align their interests to those of other shareholders, or make them entrench themselves. First of all, the sample of firms with managerial ownership is quite small. Second, in most all cases the listed firms are ultimately in the hands of a family, and managers even if they do not have direct ownership in the firm, are generally family members. It would be that managers get other forms of compensations, which should be accounted for. Another element is that, we find the same managers in different firms. So, it is the same person who is in a number of firms as a manager, which could create a link between these firms and could have an effect on the firms' value. We think that all these elements have to be considered, in order to understand the results obtained and to have a clear idea on the moral hazard problems in Belgian firms. Everything we state in this paragraph, is based on casual observation from Belgian corporate governance, it would be interesting to include them in empirical estimation if there is any available data.

We tried to use other functional forms on the performance indicator, like

piecewise specification or quadratic specification, but the results were not significant.

## **6.2 Ownership Concentration**

### **6.2.1 The First Largest Shareholder**

The ownership concentration is reflected in the small number of shareholders in the same firm, and the large percentage of shares held by them. A small fraction of shares is left to dispersed shareholders.

As for manager ownership, the largest shareholder in the firm could be an individual investor or a member of a voting block, that is several shareholders declare that they are acting in concert. Hence, the variable we consider for the largest shareholder could be the equity ownership of an individual shareholder or it could be the sum of the voting rights of the shareholders in the same voting pact. Our first definition of the largest shareholder follows the prediction of Zwiebel's (1995) study, where the ownership of the largest shareholder is defined as a function of the ownership of other shareholders around him. In a second definition, we consider the first largest shareholder without considering what it represents in the all declared ownership. He is the shareholder who has the greatest equity ownership in the firm.

Under the assumption of divisible control benefits, Zwiebel (1995) develops a theoretical model explaining why many investors choose to hold a large block of equity in the same firm. With an empirical application to US data, he confirms his model's predictions. The model predicts, first, that large investors "create their own space". In other words, the presence of a large block in the firm dissuades other large blocks to locate in the same firm. Second, the model predicts a clientele effect in the shareholder structure, in the sense that, the larger the first investor the smaller would be the number of the other investors in the same firm. Following the prediction of the clientele effect in Zwiebel's (1995) model, we consider the power of investors as a function of one another. We discriminate between shareholders using their relative size. We consider a firm as having a concentrated ownership if the largest shareholder has 50% of all declared ownership. So, our selection criterion is to consider the percentage of the largest shareholder if his shareholding represents more than 50% of all declared ownership. The float is considered as constituted of a large number of small voters. The total number of shares is normalized to the shares held by the declared shareholders as in Crama et al., (1999). This selection criterion is to put more distance between the first largest shareholder and the followers if there are any. Following the dispersion of the equity ownership in the firm, the influence of the largest shareholder would be different. The power of the largest shareholder depends on the percentage of the votes he has, but also on the votes detained by the other shareholders around him in the same firm.

According to what is stated above we define the largest shareholder (or voting block) variable (LSH) as the percentage of the largest shareholder in the firm, if his equity ownership represents more than 50% of all declared ownership according to the Belgian law on ownership disclosure.

Tables 4, 5 and 6 present statistical evidence on the high level of ownership concentration, and show that the control by a large investor (or a voting pact) is the common rule in almost all Belgian firms. For all periods around 92% of firms have a large investor detaining more than 50% of all declared equities.

As for management ownership we estimate a cross-sectional relationship between the largest shareholders (or voting blocks) ownership and firm's value as expressed by Tobin's Q. Results obtained from this regression show a negative linear and significant relationship between firm's performance and the largest shareholders' (voting blocks) equity ownership. Regression results are shown in Table 9, in the appendix.

This inverse relationship indicates the negative effect of ownership concentration on firms performance, and reveal that there will be an expropriation exercised by large shareholders at the cost of small shareholders.

We introduce other variables to control whether the previous results are not due to a spurious correlation between the largest shareholders (voting blocks) ownership and Q. Results are shown in Table 10. The relationship between the largest shareholders (voting blocks) and Tobin's Q is not affected by the introduction of additional control variables and is always negative and statistically significant, except for 1994 and 1995. However, the other control variables are not significant for all periods. It suggests that there would be a correlation between the error term and the other exogenous variables. To control if these results are due to firm heterogeneity, we use a panel data model. We run a regression with only the largest shareholder variables and year dummies. The Lagrange Multiplier and Hausman statistics indicate that we have to include firm fixed effects. The results are in columns one and two of Table 12. These results show that in the pooled form there is an inverse relationship, but with the firm fixed effects this relation is positive. The inclusion of firm fixed effects improves  $R^2$  from 5.67% to 81.34%. However, the p-value on the largest shareholders coefficient in the specification with firm fixed effects is not significant.

After the introduction of control variables the results with firm fixed effects are statistically significant. The coefficient on ownership is positive and significant. These results indicate that there is an interaction between the ownership variable and the other control variables, which have an effect on performance. They also indicate that there is firm heterogeneity which was not captured in the cross-sectional model.

The relationship between the ownership of the largest shareholders and firms' value is positive. Hence, the ownership concentration is not so bad for firm performance. Although the literature on corporate governance and law indicates that large shareholders could expropriate small shareholders, this may be the case if we could consider all the forms this expropriation takes. This literature also reports, that the large shareholders could have a monitoring role to enforce value maximization. Here we are considering the effect of ownership concentration on firm's value, and it seems reasonable that those who have the largest stakes in the firm want their value to increase.

The investment in fixed financial assets variable is positive and statistically significant. This variable represents the investment in the affiliated firms, other firms linked by participating interests, and other financial assets.

The coefficient on long term debt is positive and significant. In Deloof (1999), it was found that the firm which is part of a holding will have higher debt level than others. It would be interesting to see the effect of the debts coming from group members and the effect of the debts coming from outside the group. Unfortunately in our data it is impossible to see the origin of debts. However, the positive relationship between debt and Q is consistent with the leverage signaling conjecture [Ross (1977)] and the free-cash flow argument [Jensen (1986)].

Tobin's Q is inversely correlated with firm's size (LORC), and this is consistent with the argument that larger firms would have lower Tobin's Q.

The coefficient on R&D is positive and significant. This is consistent with the argument that these expenses increase the value of the firm.

The dummy variable CC was not introduced in the regression with firm fixed effects, because it is time invariant.

In a second definition of the largest shareholder, we consider him as the shareholder (or voting block) who has the largest percentage of equities in the firm, without looking at what he represents in the all declared ownership. The results obtained (but not reported here) are not different from those when we consider the largest shareholder as the one who has 50% of all declared ownership. This suggests that the ownership is so concentrated and the remaining small number of firms where there is another shareholder who is not so far from the first one does not change the results obtained for the relationship between ownership and Q.

As for management ownership we run a quadratic regression of LSH on Q. The results were also not significant.

### 6.2.2 The Second Largest Shareholder

We have seen that almost all listed firms have one dominant shareholder, few firms have a second shareholder, and when he exists he has a small stake in the firm. There are some exceptions for few firms which have a second shareholder who has more than 10 percent of equity ownership. We considered the second largest shareholder in firms where the first largest shareholder has more than 50% of all declared equity shares. The second largest shareholder is the one who has less than 50% of all declared ownership. Descriptive statistics are in Table 7, in the appendix.

Cross-sectionally, we find no significant results. However, panel data results, in columns one and two of Table 13, a negative non significant relationship between ownership and Q show in the pooled form. In this table the second largest shareholders variables is 2ndLSH. With firm fixed effects the relation is positive and significant. In this case there is also firm heterogeneity which was not captured in the cross-sectional model. Columns three and four in Table 13 report results with control variables. In the pooled form the coefficient on ownership is negative and not significant, and the coefficients on the other control variables are not significant. Results are significant when we take into account firm fixed effects. They show that there is a positive relation between ownership and firms' value, and the other control variables are also significant with the predictable signs. Firms' size is negative and significant, the investment in financial assets is positive and significant, and the same holds for the investment in R&D.

In columns five and six of Table 13, we introduce the debt variable. In the pooled form all coefficients are non significant. In the model with firm fixed effects, the coefficient on ownership is less significant as before (9% level of significance, against 5% before), and the coefficient on debt is positive and significant at only the 11% level.

We can conclude that the ownership of the second largest shareholders has a positive effect on the firm's value. This may find its explanation in the fact that the interests of the second largest shareholders is to maximize their value or because the first largest shareholders exert sufficient control, that it is impossible for the second to extract private benefits.

## 7 Conclusion

In this paper we investigate the relationship between ownership structure of Belgian listed firms and their performance proxied by Tobin's Q. We explore first the relationship between management ownership and firms' performance and second, the relationship between the largest shareholders ownership and firms' performance. In the empirical estimations we first use cross-sectional estimations. Afterwards, we use panel data to check for firm heterogeneity, and to see

whether the cross-sectional model is not misspecified. The results show that, in most cases, the cross-sectional model is not the right one. The specifications we used are all linear. We tried other functional forms like piecewise or quadratic regressions, but the results were not significant.

The relationship between Q and managerial ownership is negative. What let us conclude that there is no convergence of interests between managers and other shareholders. However, the introduction of control variables makes the results non significant. The same results were found cross-sectionally and in panel data.

The relationship between Q and minority controlling shareholders is negative and significant cross-sectionally, but this model is misspecified. Indeed, the statistical tests argue in favor of introducing firm fixed effects. When firm fixed effects are introduced, the ownership and firms' value are positively correlated. The presence of large shareholders maximizes firm value.

The presence of a second largest shareholder is also positively correlated with firms' value. The results cross-sectionally are not significant, while they are in the panel data model.

If more data were available, we could take into account more elements that determine the contracting environment of the Belgian context. This could help clarify certain aspects of Belgian corporate ownership.



## References

- [1] Ang James S., A.Cole Rebel and J.W. Lin, 2000. Agency Costs and Ownership Structure, *Journal of Finance*, vol.55, no.1, February, 81-106.
- [2] Bebchuk, L., R. Kraakman and G. Triantis, 1999. Stock Pyramids, Cross-Ownership, and Dual Class Equity: The Creation and Agency Costs of Separating Control from Cash Flow Rights, *NBER Working Paper 6951*.
- [3] Becht Marco, 1999. European Corporate Governance: Trading off Liquidity against Control, *European Economic Review* 43, 1071-1083.
- [4] Becht and Chappelle, 1997. Ownership and control in Belgium. In the separation of ownership and control: A survey of 7 European countries, Preliminary Report to the European Commission. Volume 2. Brussels: *European Corporate Governance Network*.
- [5] Becht Marco and Ailsa,Röell, 1999. Blockholdings in Europe: An international comparison, *European Economic Review* 43, 1049-1056.
- [6] Berle, Adolf A. and Gardiner C. Means, 1932. The modern Corporation and Private Property, *Macmillan, New York*.
- [7] Bianco, Magda and Paola Casavola, 1999. Italian Corporate Governance: Effects on Financial Structure and Firm Performance, *European Economic Review* 43, 1057-1069.
- [8] Börsch-Supan, Axel and Jens Köke, 2000. An Applied Econometricians' View of Empirical Corporate Governance Studies, *ZEW Discussion Paper No. 00-17*.
- [9] Breusch and Pagan, 1980. The Lagrange Multiplier Test and its Applications to Model Specification in Econometrics, *Review of Economic Studies* 47, 239-253.
- [10] Bubkart Mike and Fausto Panunzi, 2001. Agency Conflicts, Ownership Concentration, and Legal Shareholder Protection, *CEPR*.
- [11] Bubkart Mike and Fausto Panunzi, 1997. Large shareholders, monitoring, and the value of the firm, *The Quarterly Journal of Economics*, 693-728.
- [12] Crama Yves, Luc Leruth, Luc Renneboog, and Jean-Pierre Urbain, 1999. Corporate Governance Structures, Control and Performance in European Markets: A Tale of Two Systems, *Center for Operations Research and Econometrics, (UCL), DP N° 9942*.
- [13] Deloof Marc, 1998. Internal Capital Markets, Bank Borrowing, and Financing Constraints: Evidence from Belgian Firms, *Journal of Business Finance and Accounting*, Vol. 25 n° 7/8, 945-968.

- [14] Deloof, Marc and Ilse Verschueren, 1999. Intragroup Debt, Intragroup Guarantees, and the Capital Structure of Belgian Firms.
- [15] Demsetz, H., and K., Lehn, 1985. The structure of Corporate Ownership: Causes and Consequences, *Journal of Political Economy*, Vol 96, n°6, 1155-1177.
- [16] Dherment-Frère Isabelle, Jens Köke, and Luc Renneboog, 2001. Corporate monitoring by blockholders in Europe: Empirical evidence of managerial disciplining in Belgium, France, Germany and the UK, *ZEW DP N° 01-24*.
- [17] European Corporate Governance Network, 1997. The Separation of Ownership and Control: A Survey of 7 European Countries. Preliminary Report to the European Commission. Brussels: European Corporate Governance Network.
- [18] Fama, Eugene and Michael C. Jensen, 1983. Separation of Ownership and Control, *Journal of Law and Economics*, vol. XXVI, 301-325.
- [19] Franks J.R. and Mayer C., 1995. Ownership and control, in *Siebert. H and Mohr J.C.B eds., Trends in business organization: do participation and cooperation increase competitiveness?*, Tübingen, Paull Siebeck, 1995.
- [20] Gheysens, Regidor, and Vanthienen, 1979. Cost of equity capital of 185 Belgian companies, *Tijdschrift voor Economie en Management*, Vol. XXIV, nr. 1, 55-87.
- [21] Greene, 1997. *Econometric Analysis*, Prentice Hall, 3<sup>rd</sup> edition.
- [22] Hausman, 1978. Specification Tests in Econometrics, *Econometrica*, 46, 1251-1271.
- [23] Hayashi, 1982, Tobin's marginal q and average q: A neo-classical interpretation, *Econometrica* 50, 213-224.
- [24] Himmelberg, Charles P., R. Glenn Hubbard, and Inessa Love, 2000. Investor Protection, Ownership, and Investment, *mimeo Columbia University*.
- [25] Lang, Stulz, and Walkling, 1989, Managerial performance, Tobin's q, and the gains from successful tender offers, *Journal of Financial Economics* 24, 137-154.
- [26] La Porta, R., Lopez de Silanes, F., and Shleifer, A., 1999. Corporate Ownership Around the World, *Journal of Finance*, Vol. LIV, N° 2.
- [27] La Porta, R., Lopez de Silanes, F., Shleifer, A., and R., Vishny 2000a. Investor Protection and Corporate Governance, *Journal of Financial Economics*, 58, 3-27.

- [28] La Porta, R., Lopez de Silanes, F., Shleifer, A., and R., Vishny 2000b. Agency Problems and Dividends Policies around the World, *Journal of Finance*, VOL. LV, N°1, 1-33.
- [29] Leech, D., and J., Leahy, 1991. Ownership Structure, Control Type Classification and the Performance of Large British Companies, *The Economic Journal*, 101, 1418-1437.
- [30] Lindenberg and Ross, 1981, Tobin's q ratio and industrial organization, *Journal of Business* 54, 1-32.
- [31] McConnell and Servaes, 1990, Additional evidence on equity ownership and corporate value, *Journal of Financial Economics* 27, 595-612.
- [32] Morck, Shleifer, and Vishny, 1988, Management ownership and market valuation: An empirical analysis, *Journal of Finance Economics* 20, 293-315.
- [33] Pagano, Marco and Ailsa Röell, 1998. The Choice of Stock Ownership Structure: Agency Costs, Monitoring, and the Decision to Go Public, *The Quarterly Journal Of Economics*, 187-225.
- [34] Perfect and Wiles, 1994, Alternative constructions of Tobin's q: An empirical comparison, *Journal of empirical finance* 1, 313-341.
- [35] Renneboog, 1997, Concentration of ownership and pyramidal shareholding structures in Belgian listed companies. In the separation of ownership and control: A survey of 7 European countries, Preliminary Report to the European Commission. Volume 2. Brussels: *European Corporate Governance Network*.
- [36] Renneboog, 1996, Ownership, managerial control and the governance of companies listed on the Brussels stock exchange, KUL, *Onderzoeksrapport NR 9635*.
- [37] Renneboog Luc, 2000. Ownership, Managerial Control and the Governance of companies Listed on the Brussels Stock Exchange, *Journal of Banking and Finance*, 24, 1959-1995.
- [38] Shleifer A. and R.W. Vishny, 1989. Management Entrenchment, The Case of Manager-Specific Investment, *Journal of Financial Economics*, 25, 123-139.
- [39] Short, Helen, 1994. Ownership, Control, Financial Structure and Performance of Firms, *Journal of Economic Surveys*, Vol. 8, No.3.
- [40] Servaes, 1991, Tobin's q and the gains from takeovers, *Journal of Finance* 46, 409-419.

- [41] Smirlock, Michael, T. Gilligan, and William Marshall, 1984, Tobin's q and the structure-performance relationship, *American Economic Review* 74, 1051-1060.
- [42] Stulz René M., 1988. Managerial Control of Voting Rights: Financing Policies and the Market for Corporate Control, *Journal of Financial Economics* 20, 25-54.
- [43] Tobin, James, 1978, Monetary policies and the economy: the transmission mechanism, *Southern Economic Journal* 37, 421-431.
- [44] Tychon, 1997, The structure of corporate finance in Belgium: An empirical investigation, *IREES DP9719*.
- [45] Van Hulle, Cynthia, 1996. On the Nature of European Holding Groups, *mimeo*, *Katholieke Universiteit Leuven*.
- [46] Verbeek, 2000. A Guide to Modern Econometrics, *Wiley*.
- [47] Wernerfelt and Montgomery, 1988, Tobin's q and the importance of focus in firm performance, *American Economic Review* 89, 246-250.
- [48] Wolfenzon Daniel, 1999, A Theory of Pyramidal Ownership.
- [49] Wymeersch, Eddy, 1994. Aspects of Corporate Governance in Belgium, *Corporate Governance Research Papers*, Vol. 2 Number 3.
- [50] Zwiebel, 1995, Block investment and partial benefits of corporate control, *Review of Economics Studies*, 62, 161-185.

## A The Sample Description and Descriptive Statistics

### A.1 The Sample Description

Table 1: Number of Firms in our Sample.

	1991	1992	1993	1994	1995	1996
All Listed Firms	168	160	157	152	142	138
Banks and Insurances Companies Listed	14	14	12	11	11	10
Firms without data on NBB CD-ROMs	3	5	7	10	8	6
Firms Listed without Declaration of control	4	3	2	2	2	3
Firms in Coal and Mining	8	7	6	6	3	2
Firms with Q greater than 2.50	8	3	6	6	5	15
<b>Firms left in our sample</b>	<b>131</b>	<b>128</b>	<b>124</b>	<b>117</b>	<b>113</b>	<b>102</b>

### A.2 Tobin's Q Values

Table 2: Univariate Analysis of Tobin's Q.

YEARS	N	MEAN	STD.DEV	MAX	Q3	MED	Q1	MIN
1991	131	1.029	0.443	2.467	1.232	0.980	0.728	0.211
1992	128	0.999	0.467	2.317	1.223	0.894	0.699	0.153
1993	124	1.134	0.481	2.494	1.420	1.049	0.831	0.013
1994	117	1.148	0.470	2.478	1.475	1.060	0.869	0.046
1995	113	1.127	0.464	2.447	1.350	1.053	0.831	0.119
1996	102	1.139	0.503	2.491	1.452	1.055	0.817	0.113

In our sample insurance companies, banks, some dying firms in coal and mining, for which the balance sheets in NBB CR-Roms' are not complete, are omitted from the analysis. To obviate problems with outliers we deleted firms with a Q greater than 2.50.

### A.3 Ownership Descriptive Statistics

Table 3: Univariate analysis of managerial ownership.

YEARS	N	MEAN	STD.DEV	MAX	Q3	MED	Q1	MIN
1991	21	31.350	28.624	99.39	52.19	18.59	7.61	4.79
1992	21	28.809	24.496	76.21	52.19	17.15	6.89	4.79
1993	22	33.292	27.458	93.29	59.79	27.34	7.61	4.79
1994	22	35.049	26.843	94.87	59.79	28.87	9.45	4.79
1995	21	34.762	28.696	94.87	60.47	31.75	6.89	1.70
1996	18	35.471	31.039	94.87	64.25	33.46	6.48	1.70

Table 4: Number of firms having a large shareholder owning more than 50% of declared equity ownership.

Years	Number of firms considered in our sample	Number of firms with large shareholders	The percentage of number of firms having a large shareholder
1991	131	122	93%
1992	128	118	92%
1993	124	116	94%
1994	117	109	93%
1995	113	102	90%
1996	102	97	95%

Table 5: Univariate Analysis of the equity holding of the first largest shareholder (or voting block), who detains more than 50% of all declared equities.

YEARS	N	MEAN	STD.DEV	MAX	Q3	MED	Q1	MIN
1991	125	57.131	19.726	99.39	69.92	55.09	45.97	11.3
1992	121	58.572	19.234	99.58	69.79	55.89	48.00	11.3
1993	120	59.26	18.726	99.75	70.21	57.05	47.84	10.87
1994	113	57.643	18.026	99.75	69.53	56.21	47.64	10.87
1995	107	58.33	17.77	95.67	70.00	56.85	47.64	15.06
1996	98	60.629	19.803	99.81	77.89	57.88	48.19	15.7

Table 6: Univariate Analysis of the equity holding of the first largest shareholder (or voting block), without considering what it represents in all declared equities.

YEARS	N	MEAN	STD.DEV	MAX	Q3	MED	Q1	MIN
1991	130	55.535	20.589	99.39	69.72	54.78	43.73	11.3
1992	125	56.821	19.828	97.95	67.95	55.09	45.50	11.3
1993	121	58.338	19.377	99.75	70.00	56.75	46.94	10.87
1994	114	56.658	18.629	99.75	68.72	55.80	46.40	10.87
1995	111	56.164	19.26	95.67	69.79	55.89	44.69	10.87
1996	102	59.024	21.078	99.81	76.20	57.30	47.12	09.55

Table 7: Univariate analysis of the percentage of equity ownership of the second shareholder

YEARS	N	MEAN	STD.DEV	MAX	Q3	MED	Q1	MIN
1991	52	9.525	7.805	42.79	10.90	7.02	5.09	0.32
1992	53	9.259	7.125	42.79	10.38	8.29	5.20	0.03
1993	54	9.740	8.152	42.79	10.41	7.83	5.00	0.03
1994	46	10.089	8.898	42.79	10.57	7.21	5.00	1.17
1995	41	9.995	10.002	42.79	10.38	6.07	4.92	0.24
1996	32	10.150	10.501	42.79	10.19	6.98	4.96	0.24

## B Cross-Sectional Estimations

Table 8: OLS Regression of Q on Insiders Ownership (p values are in parentheses)

Variables	1991	1992	1993	1994	1995	1996
Intercept	1.299 (0.0001)	1.279 (0.0001)	1.605 (0.0001)	1.527 (0.0001)	1.417 (0.0001)	1.318 (0.0001)
<b>INS</b>	<b>-0.007</b> (0.0818)	<b>-0.010</b> (0.0290)	<b>-0.014</b> (0.0009)	<b>-0.012</b> (0.0019)	<b>-0.008</b> (0.0254)	<b>-0.006</b> (0.1231)
R-square	15.09%	22.70%	43.38%	39.11%	23.64%	14.21%
N	20	21	21	21	20	16

Table 9: Regression of Q on Largest shareholder Ownership (p values are in parentheses).

Variables	1991	1992	1993	1994	1995	1996
Intercept	1.311 (0.0001)	1.339 (0.0001)	1.419 (0.0001)	1.391 (0.0001)	1.394 (0.0001)	1.615 (0.0001)
<b>LSH</b>	<b>-0.005</b> (0.0186)	<b>-0.006</b> (0.0133)	<b>-0.005</b> (0.0462)	<b>-0.004</b> (0.0933)	<b>-0.004</b> (0.0830)	<b>-0.008</b> (0.0022)
R-square	04.42%	05.04%	03.33%	02.52%	02.83%	09.32%
N	125	121	120	113	107	98

Table 10: OLS Regression of Q on Largest shareholder Ownership, Research and Development, Financial Assets, Debts, Log of Replacement cost, and coordinate-centers, (p values are in parentheses).

Variables	1991	1992	1993	1994	1995	1996
Intercept	1.476 (0.0101)	2.177 (0.0003)	2.166 (0.0003)	2.743 (0.0001)	2.208 (0.0004)	2.156 (0.0012)
LSH	-0.005 (0.0295)	-0.005 (0.0212)	-0.004 (0.0770)	-0.003 (0.1933)	-0.003 (0.2073)	-0.006 (0.0163)
RDRC	-1.456 (0.7805)	2.544 (0.5598)	4.384 (0.3326)	3.626 (0.3458)	5.142 (0.2160)	-7.127 (0.4560)
FARC	0.038 (0.7682)	0.077 (0.5893)	0.331 (0.0200)	0.265 (0.0659)	0.469 (0.0013)	0.493 (0.0018)
DBRC	0.233 (0.5441)	0.283 (0.4470)	0.036 (0.9168)	0.274 (0.4324)	0.383 (0.2267)	0.157 (0.6718)
LORC	-0.027 (0.6467)	-0.102 (0.0951)	-0.108 (0.0766)	-0.175 (0.0060)	-0.128 (0.0430)	-0.101 (0.1329)
CC	0.179 (0.1213)	0.185 (0.1265)	0.265 (0.0270)	0.321 (0.0060)	0.153 (0.1957)	0.186 (0.1276)
N	125	121	120	113	107	98
R-square	07.35%	08.92%	11.95%	14.46%	15.43%	22.12%

## B.1 Panel Data Estimations

### B.1.1 Managerial Ownership



Table 11: Panel data regression of firm value from 1991 to 1996, as a linear function of listed explanatory variables. Intercept terms and year dummies are included for all regressions, but not reported. (P-values are in parentheses).

Variables	Pooled	Random Effects	Pooled	Firm Fixed Effects
INS	-0.00950 (0.0000)	-0.00670 (0.0002)	-0.00887 (0.0000)	-0.00149 (0.5596)
LORC			0.851 (0.1634)	-0.662 (0.0000)
RDRC			122.09 (0.2488)	1.783 (0.9793)
DBRC			0.501 (0.0845)	0.281 (0.2373)
FARC			0.109 (0.3938)	0.540 (0.7232)
N	121	121	121	121
R-square	28.32%	86.92%	35.95%	92.38%

### B.1.2 The First Largest Shareholders (or Voting Blocks) Ownership

Table 12: Panel data regression of firm value from 1991 to 1996 as a linear function of listed explanatory variables. Intercept terms and year dummies are included for all regressions, but not reported. (P-values are in parentheses).

Variables	Pooled	Firm Fixed Effects	Pooled	Firm Fixed Effects
LSH	-0.00529 (0.0000)	0.0000150 (0.9912)	-0.00461 (0.0000)	0.00270 (0.0308)
LORC			-0.0479 (0.0287)	-0.490 (0.0000)
RDRC			3.033 (0.1107)	13.809 (0.0014)
DBRC			0.305 (0.0360)	0.364 (0.0082)
FARC			0.266 (0.0000)	0.335 (0.0000)
N	675	675	675	121
R-square	05.67%	81.34%	09.36%	85.15%

### B.1.3 The Second Largest Shareholders (or Voting Blocks) Ownership

Table 13: Panel data regression of firm value from 1991 to 1996 as a linear function of listed explanatory variables. Intercept terms and year dummies are included for all regressions, but not reported. (P-values are in parentheses).

Variables	Pooled	Firm Fixed Effects	Pooled	Firm Fixed Effects	Pooled	Firm Fixed Effects
2ndLSH	-0.00410 (0.1873)	0.00963 (0.0315)	-0.00379 (0.2382)	0.00814 (0.0581)	-0.00352 (0.2725)	0.00728 (0.0911)
LORC			0.0133 (0.6915)	-0.228 (0.0039)	0.000174 (0.9959)	-0.247 (0.0019)
RDRC			8.841 (0.2453)	36.097 (0.0028)	5.201 (0.5073)	34.637 (0.0040)
FARC			0.0389 (0.6896)	0.384 (0.0002)	0.0462 (0.6339)	0.380 (0.0002)
DBRC					0.364 (0.0766)	0.323 (0.1129)
N	270	270	270	270	270	270
R-square	04.33%	83.69%	05.45%	85.68%	06.19%	85.87%