Interlocking Directorates and Business Groups: Belgian Evidence

An ROMMENS
University of Antwerp

Ludo CUYVERS
University of Antwerp

Marc DELOOF
University of Antwerp

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Abstract

We investigate the determinants of interlocking directorates and their impact on company performance for a Belgian sample of 286 companies affiliated with a business group and 2,136 stand-alone companies. Most of these companies are not listed. We find that companies belonging to a group have much more interlocking directorates than stand-alone companies. Group companies tend to be strongly interlocked with other group members, including parent companies, and they have more intra-group interlocks when they are located at a higher hierarchical group level. Group companies have more vertical interlocks when they are involved in an internal capital market and when they are affiliated with a diversified business group. We also find that while interlocking directorates are negatively related to the profitability of stand-alone companies, they do not affect the profitability of group companies. This suggests that directors in Belgian business groups are not "too busy", and that intra-group interlocks are not facilitators of expropriation by controlling shareholders.

Keywords: Interlocking directorates, business groups, holding companies, company performance

Corresponding author: An Rommens, University of Antwerp, City Campus, B319, Prinsstraat 13, 2000 Antwerp, Belgium; Email: An.Rommens@ua.ac.be; Tel: +32-(0)3-220 41 89; Fax: +32-(0)3-220 40 64

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1. Introduction

Business groups are ubiquitous around the world. They typically consist of legally independent firms operating in multiple markets, bound together by persistent formal and informal ties. Group members may be tied by cross-shareholdings or by direct or indirect controlling stakes held by an ultimate shareholder, or they may cooperate without ownership links. Informal ties may take the shape of family ties, social ties or interlocking directorates (e.g. Granovetter, 2005). Many studies have found that interlocking directorates generally play an important role in business groups in countries such as Belgium (Cuyvers and Meeusen, 1976, 1985), Canada (Attig and Morck, 2005), China (Keister, 1998), India (De, 2003), Israel (Maman, 1999), Japan (Gerlach, 1992; Lincoln et al., 1992), and Sweden (Collin, 1998).

While there is an extensive literature on interlocking directorates, few studies have focused on intra-group interlocks. In line with the *resource dependence* model, which interprets interlocks as an organizational mechanism to co-opt other companies in an uncertain environment, most of these studies explain intra-group interlocks as a means of controlling and coordinating group members, and as a tool to pass information among group members (Orrù et al., 1989; Collin, 1998; Keister, 1998). Intra-group interlocks may also be the result of an internal directors' market in business groups, which provides directors with opportunities for internal mobility (Maman, 2001). Some authors have argued that interlocks facilitate the expropriation of value from interlocked group members by controlling shareholders, especially when there is a diversion between the cash flow rights and the voting rights of the controlling shareholders (Attig and Morck, 2005; Silva et al., 2006).

In this paper, we investigate the determinants of interlocking directorates and their impact on company performance for a sample of 2,422 Belgian companies in 2001. Belgium provides a interesting environment to study interlocks in business groups, because family-controlled financial and industrial groups still play an important role in the accumulation and allocation of capital, as is the case in many other Continental European countries.

We differentiate between 286 companies belonging to a business group controlled by a listed holding company, and 2,136 stand-alone companies. We consider interlocks of group companies with stand-alone companies, intra-group interlocks, and vertical interlocks, i.e. intra-group interlocks with parent companies of the group. We find that companies belonging to a group have much more interlocks than stand-alone companies, because group companies are strongly interlocked with other group members, including parent companies.

We also consider the effect of business group characteristics on intra-group interlocking directorates. First, we hypothesize that in business groups with multiple hierarchical levels, directors who are positioned in higher levels of the group hierarchy accumulate more directorships than directors in lower levels of the group. Placing trustworthy directors holding high positions in the group in the board of group members improves the coordination of the group and minimizes opportunistic behavior of group members (Maman, 2001). Second, we test the hypothesis that group companies involved in an internal capital market will have more vertical interlocking directorates than other group companies, because internal capital markets require central coordination and monitoring. Following Maman (1999), who argues that vertical interlocks will especially be useful in groups employing diversification strategies which create control and coordination problems, we also hypothesize that there will be more vertical

interlocking directorates in diversified business groups than in focused business groups. Each of these hypotheses is confirmed by the empirical results.

Finally, we investigate the impact of interlocking directorates on profitability. Interlocking directorates may increase profitability because they facilitate information flows between a company and its partners and financiers (e.g. Schoorman et al., 1981; Haunschild and Beckman, 1998; Gulati and Westphal, 1999) and between group members (e.g. Collin, 1998; Keister, 1998). Moreover, interlocks may be due to the presence of high quality directors on the board, and the qualities of these directors may also contribute to a higher profitability. On the other hand, it could be argued that busy directors who have less time to dedicate to any one of their mandates are less effective, thereby decreasing profitability (Shivdasani and Yermack, 1999; Ferris et al., 2003; Fich and Shivdasani, 2006). Intra-group interlocks may be used by the ultimate controller of the group as a tool to expropriate value from group members, thereby reducing profitability (e.g. Meeusen and Cuyvers, 1985; Silva et al., 2006). Consistent with the results of other studies (Loderer ad Peyer, 2002; Fich et al., 2006), we find that interlocking directorates are negatively related to the profitability of stand-alone companies. However, we also find that interlocking directorates do not affect the profitability of group companies, which indicates that directors in Belgian business groups are not "too busy", and that intra-group interlocks are not facilitators of expropriation by controlling shareholders.

This study contributes to the literature on interlocks and business groups in several respects. We are not aware of other studies which compare interlocking directorates of group companies to those of stand-alone companies. Moreover, to the best of our knowledge, this study is the first to investigate the determinants of intra-group interlocks in a multivariate setting, taking into account the nature of the group to which the company belongs, the involvement of the company

in an internal capital market, and the hierarchical group level at which the company is situated. This study also provides a fairly unique view on interlocking directorates by considering a sample of companies of which almost none are listed on a stock exchange.

The remainder of the paper is organized as follows. First, we review the features of business groups and company boards in Belgium. We discuss the motives for (intra-group) interlocks in section three, and we describe the sample on which the empirical analysis is based in section four. The empirical results are reported in section five. We draw some conclusions in the last section.

2. Business groups and company boards in Belgium

2.1. Business groups

In Belgium, as in other Continental European countries, business groups typically consist of layers of quoted and non-quoted holding companies, in which the ultimate shareholders control non-holding companies through complex cross-shareholdings and pyramidal structures. A holding company can be defined as "a professionally managed institution owning a portfolio of stocks in public and private companies with the purpose of influencing them. In realizing this objective, a holding company acts both as a financial intermediary and as an active shareholder." (Banerjee et al., 1997). These groups are typically based on formal ownership ties.

The importance of Belgian business groups, based on holding company structures, should be seen in its historical context. As a reaction to the worldwide financial crisis at the beginning of the 1930s, a law was introduced in 1934 that forced the universal banks, which historically

dominated the Belgian economy, to separate their banking and investment activities. This led to the establishment of holding companies, which owned a diversified portfolio of investments in a wide range of industrial and commercial activities, and were the largest shareholders in Belgium throughout the 20th century. Pyramidal ownership structures allowed these holding companies to maintain control over their subsidiaries with only limited investments. In recent times, Belgian holding companies remain important investors in financial, industrial and commercial companies (Becht et al., 2000).

Because of fundamental differences in managerial organization, comparisons of groups controlled by Belgian holding companies with American conglomerates are bound to be misleading. American conglomerates are tightly structured, whereas Belgian groups are typically more loosely structured organizations of distinct legal entities. Belgian corporate groups also differ from Japanese financial Keiretsu groups. While Belgian groups have a *hierarchical* structure, with a holding company controlling a pyramid of companies, members of the Japanese Keiretsu are considered equals. Traditionally, these members have close ties with one bank, which plays an important role in the financing of these companies, and is responsible for monitoring the business affairs. For Belgian groups, it is the controlling holding company that monitors members and intervenes in corporate policy or replaces management when deemed necessary. Banks stick to traditional banking activities and therefore play a smaller role in the management and financing of group members than does the main bank in a Keiretsu. Furthermore, while there is extensive co-ordination of trade through a group trading company in the Japanese Keiretsu, no trading companies or centralized buying or selling organizations exist in Belgian groups, which are primarily financial.

2.2. Company boards

Company boards in Belgium have a one-tier structure. “Naamloze vennootschappen” (“Sociétés Anonymes”), the most common form of limited liability companies, have to have a minimum of three directors. For other company types no legal minimum number of directors is stipulated. There is no maximum number of directors. Candidates for the board are nominated by the board of directors, and the shareholders’ meeting then votes by simple majority. Directors are appointed for a maximum of six years, but their mandate is renewable. Directors can be replaced at any time by a simple majority vote of the shareholders. The task of the board of directors is described in the law as follows: “All acts necessary or useful for achieving the goal of the company with exception of the competences assigned by law to the shareholders’ meeting”. The Belgian Corporate Governance Code for listed companies, published in December 2004, recommends that the basic task of the board of directors consists of: appointing management, setting up a policy plan and a structure to achieve the goals stipulated in the plan, supervise the implementation of the policy plan, and inform shareholders.

3. Interlocks and business groups

3.1. Motives for interlocks

The literature advances several non-mutually exclusive explanations for the prevalence of interlocking directorates (see Mizruchi, 1996, for a survey). The resource dependence model sees interlocks as an organizational mechanism to co-opt other companies in an uncertain environment, so that each company depends on the other for resources. Information asymmetries and other uncertainties make corporate environments highly unpredictable, and interlocks may facilitate information flows between companies (e.g. Schoorman et al., 1981;

Haunschild and Beckman, 1998, Gulati and Westphal, 1999). This information may include collusive information about competitors: interlocking directorates between competitors could therefore provide a means to distort competition, as competing firms may have common directors in order to strengthen collusive deals (e.g. Dooley, 1969; Schoorman et al., 1981; Gulati and Westphal, 1999). Interlocks may also be facilitators of information flows between companies and financial institutions and monitoring by financial institutions. Interlocks could thereby improve access to finance and lower the cost of finance (e.g. Richardson, 1987; Mizruchi and Stearns, 1994; Kroszner and Strahan, 2001; Santos and Rumble, 2006). However, financial institutions could abuse the control they exercise through interlocks by subordinating the interests of the company to their own interests (e.g. Richardson, 1987; Kroszner and Strahan, 2001).

Representatives of financial institutions which do not provide funds to the company may be appointed on the board because they provide expertise and certification to companies, which would be especially valuable to distressed companies (Booth and Deli, 1999; Byrd and Mizruchi, 2005). More generally, the recruitment of prominent and well-placed outsiders to the board enables companies to accumulate relevant business and political information, enhances the standing of the company, and may serve a useful public-relations function (e.g. Schoorman et al., 1981; Scott, 1985; Loderer and Peyer, 2002). The outsiders who join boards may themselves be motivated by financial remuneration, prestige and contacts that may prove useful in securing subsequent employment opportunities (e.g. Zajac, 1988; Mizruchi, 1996).

Some authors argue that top managers select passive outside directors to reduce pressure from active monitoring (Zajac and Westphal, 1996; Shivdasani and Yermack, 1999). In line with this

argument, the results of Hallock (1997) and Fich and White (2005) suggest that CEOs in the US are reciprocally interlocked with another CEO to raise each other's pay.

Finally, the class-cohesion model holds that interlocks represent social ties between members of the upper class, expressing and contributing to the cohesion of this class (e.g. Mills, 1956; Koenig et al, 1979).

3.2. Intra-group interlocks

While there is an extensive literature on interlocking directorates, only a limited number of studies have considered intra-group interlocks. In line with the resource dependence model, most of these studies see intra-group interlocks primarily as a means of controlling and coordinating group members, and as a tool to pass information among group members.

According to Collin (1998), interlocking directorates allow business groups to pool information concerning the various members and their managers, thereby improving monitoring by headquarters. Interlocks also provide individual group members access to a rich information network, which enhances their strategic decision making. According to Maman (1999), vertical interlocks between group members and parents, grandparents or more remote ancestors are an organizational mechanism for controlling group members. They will especially be useful in large groups employing diversification strategies, which are often associated with control and coordination problems. The purpose of horizontal interlocking on the other hand would be to coordinate sister firms within the group. Horizontal interlocks contribute to maintaining and promoting transactions between group members, to keeping the unity within the group, and to creating a communication network (Orrù et al., 1989).

Keister (1998), who investigates interlocks in Chinese business groups, stresses the role of interlocks as an information source for interlocked firms: interlocks allow information about technological advances, market opportunities, innovative strategies, etc. to pass among firms in the group. They also decrease transaction costs, facilitate the management of resource flows, serve as a monitoring mechanism, and are a reflection of social cohesion. All firms in a group in which any firms are interlocked will benefit from these interlocks because member firms are tightly connected through other relations. Information passed through the interlocks will continue to spread through these other connections with each other.

The results of Maman (2001) on Israeli business groups support the hypothesis of an internal directors' market in business groups. According to Maman, such an internal market provides directors with opportunities for internal mobility. These opportunities serve as a safeguard and an incentive not to leave the group. In such a system, directors who are positioned in higher levels of the group hierarchy will accumulate more directorships than directors in lower levels of the group. Placing "inner circle" directors holding high positions in the group in the board of different group members will improve the coordination of the group. Moreover, appointing trustworthy directors who are loyal to the group as a whole can minimize opportunistic behavior of group members. For the group directors themselves, accumulation of directorships could be signal of commitment to the group, and it could be a reward from the group to loyal directors.

While these arguments suggest a positive relation between intra-group interlocks and the profitability of group members, the empirical evidence on this issue is mixed. Keister (1998) finds that the presence and predominance of interlocking directorates in Chinese business groups improves the financial performance and the productivity of group members. De (2003)

also finds a positive relationship between intra-group interlocks and the return on assets of Indian group firms.

The results of Meeusen and Cuyvers (1985) on the other hand suggest that interlocks of Belgian companies with holding companies in 1976 were associated with lower profitability. This is consistent with the hypothesis that controlling shareholders of business groups use interlocks to facilitate the expropriation of value from interlocked group members. The finding of Silva et al. (2006) that the impact of intra-group interlocks on the performance of Chilean group members depends on the diversion between cash flow rights and voting rights of the controlling shareholders, also confirms the "expropriation" hypothesis. Indeed, the convergence of cash flow rights and voting rights, which reduces the negative effect of interlocks on performance of Chilean group members, also reduces the incentive for controlling shareholders to expropriate value at the expense of minority shareholders (see e.g. Bebchuk et al., 2000). Attig and Morck (2005) provide indirect evidence on the expropriation hypothesis: they find that vertical interlocks are associated with greater corporate opacity.

The literature on intra-group interlocks leads us to expect that companies belonging to a group have more interlocking directorates than stand-alone companies. The value of intra-group interlocks for the parties involved will tend to be greater than the value of interlocks between unrelated companies. While stand-alone companies are assumed to pursue their own interest, the actions of companies belonging to a group will also be dictated by the interests of the group. Interlocking directorates contribute to the interests of the group by facilitating information flows between group members, and improving coordination and control of group members. Moreover, as Maman (2001) notes, interlocking directorates may be the exponent of an internal director's

market, providing internal directors with opportunities for internal mobility. This leads to the following hypothesis:

Hypothesis 1: Companies belonging to a group have more interlocking directorates than stand-alone companies.

Our next hypothesis is based on the argument of Maman (2001) that in business groups with multiple hierarchical levels, directors who are positioned in higher levels of the group hierarchy accumulate more directorships than directors in lower levels of the group. Placing trustworthy directors holding high positions in the group in the board of group members improves the coordination of the group and minimizes opportunistic behavior of group members. In line with the results of Maman for Israeli business groups, it can be expected that, directors of group companies located at a higher hierarchical level will have more directorships than directors of group companies located at a lower level. We therefore hypothesize:

Hypothesis 2: Companies located at a higher hierarchical level within a group will have more interlocking directorates than companies located at a lower hierarchical level.

An internal capital market which transfers resources across group members plays an important role in many business groups, not only in emerging countries (e.g. Khanna and Palepu, 2000; Khanna and Yafeh, 2005), but also in developed countries such as Belgium (e.g. Verschueren and Deloof, 2006; Buysschaert et al., 2007). Gertner, Scharfstein and Stein (1994) point out that while an external bank does not own the firms to which it lends, in an internal capital market corporate headquarters own the business units (at least partially) to which they allocate capital. In other words: in an internal capital market, the residual control over the use of the firm's

assets resides with the capital supplier, which is not the case when an external bank provides capital. The internal provider of capital therefore will get more of the gains from monitoring. Stein (1997) demonstrates that even if headquarters of a corporate group are not able to relax overall firm-wide financing constraints, they can create value by reallocating funds on an internal capital market to competing projects. An internal capital market, which requires central coordination, will therefore generate more monitoring than bank lending. Within business groups, vertical interlocks between parent companies and subsidiaries are major organizational tools used by parent companies for the coordination and monitoring of group members (e.g. Maman, 1999). We therefore expect that group companies involved in an internal capital market will have more vertical interlocking directorates than other group companies:

Hypothesis 3: Group companies participating in an internal capital market will have more vertical interlocking directorates than group companies not participating in an internal capital market.

Business groups can be diversified or focused. Diversified groups are typically characterized by active internal capital and managerial labor markets, because they can transfer capital and talented employees from group members facing declining prospects to group members on the rise (e.g. Khanna and Palepu, 1997; Khanna and Yafeh, 2005). Internal labor markets also make it possible for managers to rotate across the various activities in the group, thereby developing the skills necessary to manage a diversified business group. Internal markets create the need for central coordination and monitoring. Following Maman (1999), who argues that vertical interlocks will especially be useful in groups employing diversification strategies which create control and coordination problems, we posit that there will be more vertical interlocking directorates in diversified business groups than in focused business groups:

Hypothesis 4: Companies belonging to a diversified business group will have more vertical interlocking directorates than companies belonging to a focused business group.

4. Sample

The sample we use to test the hypotheses consists of Belgian group companies and Belgian stand-alone companies. We define group companies as those companies which are affiliated with holding companies listed on Euronext Brussels (formerly the Brussels Stock Exchange) in 2001. We focus on companies affiliated with listed holding companies, because these holding companies represent most of the economically important Belgian business groups, and we do not have all information necessary to reliably identify business groups controlled by unlisted holding companies. We used the classification of Euronext Brussels to identify listed holding companies. Euronext Brussels defined holding companies as "those companies whose purpose is to invest in other (quoted) companies, except financial institutions". To this list of holding companies, we added one holding company which went public after February 2000. Mutual funds and state-owned holding companies were excluded. As a result, we obtained a list of 25 listed Belgian holding companies. As some of these holding companies belonged to the same group, they represent 19 business groups.

For each of the selected holding companies, we consulted the audited 2001 consolidated annual statements deposited at the National Bank of Belgium, and included in the sample all Belgian subsidiaries which were fully or proportionally consolidated. According to the Belgian accounting law, all subsidiaries which are directly or indirectly controlled by the parent company should be consolidated. If one of these subsidiaries had a consolidated annual

statement itself, its Belgian subsidiaries were also incorporated in the sample. This procedure was repeated until a level was reached on which none of the Belgian subsidiaries had a consolidated annual statement. Companies for which no information on the board of directors was available were removed from the sample, as well as companies of which the board of directors consisted only of legal persons. Companies for which only an abbreviated financial statement[1] was available were also eliminated. This procedure resulted in 422 group companies[2].

To identify stand-alone Belgian companies, we first selected "independent" companies from the Belfirst-DVD of Bureau Van Dijk. Bureau Van Dijk defines independent companies as "any company with known recorded shareholders, none of which having more than 24.9% of direct or total ownership". From the resulting list we excluded companies for which no information was available on the board of directors, companies of which the board of directors consisted only of legal persons, and companies for which only an abbreviated financial statement was available. We also excluded all companies that reported group liabilities, group receivables or group guarantees. The purpose of this last restriction was to remove companies that are misclassified as independent by Bureau Van Dijk. This procedure resulted in 2,680 stand-alone companies.

We determined interlocking directorates for this sample of 3,104 companies, of which 424 companies belong to a group and 2,680 companies are stand-alone companies. This sample

[1] Companies are obliged to deposit their financial account at the National Bank of Belgium in the complete format if they have more than 100 employees or if they satisfy at least two of the following criteria: number of employees (yearly average) of at least 50, turnover (value-added tax excluded) of at least 6.250.000 Euro (EUR)) and total assets of at least 3.125.000 EUR. Otherwise they are allowed to deposit only an abbreviated format.

[2] Two companies were deleted because they were the only members of their group represented in the sample, which makes it impossible to determine intra-group interlocks.

includes a substantial number of financial companies. We considered these companies when determining interlocking directorates, in order to obtain a full picture of all the interlocks non-financial companies have, both with financial and non-financial companies. However, for the empirical analysis we restrict the sample to non-financial companies, as financial companies may have different motives for engaging in interlocking directorates than non-financial companies, and some of the variables used in the multivariate analysis cannot be interpreted in the same way for financial companies and non-financial companies. Pooling both types of companies could blur our findings.

The final sample on which the analysis in this paper is based includes 2,422 non-financial companies, of which 286 were categorized as group companies and 2,136 as stand-alone companies. This sample contains only sixteen listed companies, which all belonged to a group. The group companies in our sample represent 17 different groups. One group was deleted from the sample because no information was available on the directors of its subsidiaries, and one group was dropped from the sample because it included only non-Belgian subsidiaries. Most of the groups in our sample were controlled by Belgian families or individuals, with two exceptions: the *Société Financière des Caoutchoucs* controlled by the French *Bollore* group, and the *Compagnie Benelux Paribas* controlled by the French *BNP Paribas* group. Table 1 gives an overview of the 17 groups represented in the sample. The number of sample companies for each group ranges between 1 (*Sofina*) and 66 (*Ackermans en Van Haaren*)[3]. The consolidated total assets of the controlling holding company ranges between 35 mio € (*Floridienne*) and 3,789 mio € (*Almanij*). Table 1 also reports the number of hierarchical levels in the group. We consider the ultimate parent company as level number one, its subsidiaries

[3] For most groups the number of sample companies is less than the total number of companies they controlled because foreign companies, companies for which no information was available on the board of directors or companies of which the board of directors consisted only of legal bodies, and companies for which only an abbreviated annual report was available were left out of the sample.

(based on the consolidation criterion) as number two, and so on. Most groups have only two levels, which means that none of the subsidiaries consolidated by the holding company had a consolidated annual report itself. Three groups (*Compagnie Nationale à Portefeuille*, *Mitiska* and *Solvac*) had three levels, four groups (*Ackermans en Van Haaren*, *Auximines*, *Compagnie Benelux Paribas* and *Financière de Tubize*) had four levels, and one group (*Almanij*) had five levels.

Insert Table 1 about here

We also differentiate between diversified groups and focused groups, using the classification system of Rumelt (1974), which is widely used in the strategic management literature (Martin and Sayrak, 2003). Rumelt considers a company to be focused if at least 70% of the activities were part of the largest group of activities that are related through a common skill, resource, market or purpose; otherwise it is classified as diversified[4]. Diversification measures in finance research are commonly based on the SIC-classification. While such measures are arguably more objective than the Rumelt classification, in this paper we could not use SIC-based measures because for some (foreign) group subsidiaries there was no information on the industry in which they operated. Moreover, as Martin and Sayak (2003) note, diversification measures based on SIC codes are to some extent also based on subjective choices (such as the level of refinement that should be used when counting business involvement), and their reliability depends on the correctness and internal consistency of the SIC system.

[4] This cut-off point of 70% is based on the observation that the share of the main activity in the total activities generally is either between 80% and 100% or less than 60%, but seldom between 60% and 80%.

Following Rumelt (1974), we classified ten groups (182 companies) as diversified groups and seven groups (104 companies) as focused groups. Obviously, determining the relative importance of "the largest group of activities that are related through a common skill, resource, market or purpose" required some judgement, but for most groups outlining this group of activities turned out to be quite straightforward. However, for three groups (*Financière de Tubize*, *Société Financière des Caoutchoucs*, *Solvac*) the classification may be disputable. We categorized these groups according to our judgment, but as a robustness check we re-estimated the regressions reported in this paper which consider differences between focused groups and diversified groups with the alternative classification. The alternative classification does not affect our results.

5. Results

5.1. Interlocking directorates and interlocked companies

Insert Table 2 about here

Table 2 reports the number of interlocking directorates and the number of interlocked companies for our sample[5]. It reveals a huge difference between group companies (panel A) and stand-alone companies (panel B). Group companies have on average 15.82 interlocking directorates (median is 11), while the average stand-alone company has only 1.22 interlocking directorates (median is zero). Most of the interlocks of group companies are interlocks with

[5] One (inevitable) limitation of our approach is that we can only measure interlocks with the 3,104 selected financial and non-financial companies. The companies in our sample may also have substantial interlocks with companies not considered in this study.

companies belonging to the same group: the average number of intra-group interlocking directorates is 13.78 (median is 9.5), while the average number of interlocking directorates with stand-alone companies is only 0.71 (median is zero), and with companies belonging to other groups is 1.33 (median is zero). We also consider the number of interlocking directorates with parent companies belonging to the same group. A group company is assumed to be a parent company if the company had a *consolidated* financial statement. We consider the number of interlocking directorates with parent companies as a proxy for vertical interlocks, i.e. interlocks with parents, grandparents or more remote ancestors. The average number of interlocks with parent companies is 2.32 (median is one), which implies that group companies are typically interlocked with parent companies. Group companies also have on average 1.33 interlocking directorates with companies belonging to other groups, which suggests that there are not only substantial ties *within* groups, but also *between* groups.

A similar picture emerges when we consider the number of interlocked companies. Two companies are assumed to be interlocked if they share at least one director. The average number of companies interlocked with a group company is 9.97 (median is 7), of which 8.13 companies belong to the same group (median is 6). The average number of companies interlocked with a stand-alone company is only 0.80 (median is 0).

The high incidence of intra-group interlocks is also revealed by a density measure, which relates the number of interlocking directorates (interlocked companies) to the *potential* number of interlocking directorates (interlocked companies). The mean density of intra-group interlocking directorates is 10.12% (median is 5.06%), and the mean density of interlocked companies is 22.79% (median is 16.91%). This implies that a company belonging to a group is on average interlocked with almost a quarter of all group members. The mean density of interlocked parent

companies is even higher at 25.90% (median is 10%), which suggests that vertical interlocks play an important role in Belgian business groups. Combined, these results suggest that interlocking directorates are much more important for companies affiliated with a business group than for stand-alone companies, and that group companies are strongly interlocked with companies belonging to the same group.

5.2. Determinants of interlocking directorates

We now investigate whether group companies have more interlocks than stand-alone companies in a multivariate setting. This allows us to control for factors which have been identified in the empirical literature as having an effect on the number of interlocking directorates.

- First, it can be expected that larger companies have more interlocks. According to Booth and Deli (1996), larger firms have wider contractual environments, requiring negotiations with more parties. Moreover, directors of larger firms may be more attractive as candidates for other boards, because of the networking contacts they represent to these firms, and they may be perceived as more skilled because of the size and the complexity of operations they oversee (e.g. Dooley, 1969; Mizruchi and Stearns, 1988; Ferris et al., 2003; Ong, 2003). Our measure of size is *Log(Size)*, which is the logarithm of the company's total assets in 2001.

- Several studies posit a positive relation between representatives of financial institutions on the board and the leverage of firms. As the presence of a banker on the board could be an important monitoring mechanism for the bank, it could be more willing to lend funds to interlocked firms (e.g. Dooley, 1969; Mizruchi and Stearns, 1994). Moreover,

the presence of non-lending bankers on the board might provide expertise and certification, also making it easier for the firm to obtain loans (Booth and Deli, 1999; Byrd and Mizruchi, 2005). Highly indebted firms may therefore be more likely to have interlocks with financial institutions. However, it could also be argued that lending bankers are less likely to be on the boards of highly indebted firms, if the potential costs of conflicts and lender liability are large (Kroszner and Strahan, 2001, Byrd and Mizruchi, 2005). The net effect of leverage on the number interlocking directorates of a firm is therefore *a priori* not clear. We measure *Leverage* by the ratio of total debt to total assets in 2001.

- The number of interlocking directorships of a company may also be related to previous company performance. On the one hand, previous performance may *increase* the number of interlocks, as quality directors who increase company performance should receive the greatest number of offers to serve as a director (e.g. Loderer and Peyer, 2002; Ferris et al., 2003). However, it can also be argued that firms experiencing financial decline will add directors representing financial institutions to their board, thereby increasing the number of interlocks (Mizruchi and Stearns, 1988). This could lead to a *negative* relationship between previous performance and the number of interlocks. Our measure of previous performance *Profitability 1999-2001* is the average earnings before interests and taxes over total assets in the period 1999-2001.

As there are 16 listed companies in our sample, we also include a variable *Listed Company*, which is a dummy equal to one if the company is listed, and zero otherwise. Furthermore we control for board size by including *Log(Number of Directors)*, which is the log of the number of directors of the company. Companies with larger boards are likely to have more interlocking

directorships, ceteris paribus. Finally, we include one digit industry dummies in all regressions to capture possible industry effects.

Insert Table 3 about here

Descriptive statistics for these variables are presented in Table 3, which differentiates between group companies and stand-alone companies. This table shows that there are significant differences between the group companies and the stand-alone companies in our sample. Group companies tend to be larger, they have a lower leverage and they have more directors than the stand-alone companies (differences in means are all significant at the 1% level). The average profitability over 1999-2001 on the other hand does not differ significantly between group companies (2.3%) and stand-alone companies (2.2%)[6].

Insert Table 4 about here

The regression results are presented in Table 4. We use the negative binomial regression model, as the dependent variable is a count variable which is subject to overdispersion (e.g. Greene, 1997). In regression 1, which is based on the full sample, the coefficient of the group company dummy is positive and significant at the 1% level, confirming that group companies have more interlocking directorates than stand-alone companies.

[6] Buysschaert et al. (2007) find for a sample very similar to ours that group affiliation does have a significant negative effect on company performance in a multivariate setting.

As for the other explanatory variables, we find a significant positive relation (at the 1% level) between firm size and the number of interlocks. This is consistent with the hypothesis that larger firms have wider contractual environments, requiring negotiations with more parties, and the hypothesis that directors of larger firms are more attractive as candidates for other boards. The positive relation between size and interlocks is also significant in regression 2, which is based on the subsample of stand-alone companies.

Furthermore, we find a significant negative relation between leverage and the number of interlocks, both in regression 1 (full sample) and in regression 2 (stand-alone companies). It has been argued that lending bankers are less likely to be on the board of highly indebted firms because of the potential costs of conflicts and lender liability, which may affect the total number of interlocks. Furthermore, it could be argued that directors of highly indebted firms are less attractive as candidates for other boards. However, we also find that the coefficient of profitability 1999-2001 is negative but not significant in regression 1 (full sample), and significantly negative in regression 2 (stand-alone companies). This negative relation suggests that profitable stand-alone companies have less need for interlocking directorates, which seems to contradict the result for leverage.

When we consider the determinants of interlocking directorates for group companies (regression 3), we find that, except for the number of directors, none of the company characteristics which are generally assumed to affect the number of interlocking directorates show any significant relationship. It therefore seems that interlocks of group companies are driven by other factors.

As for the other variables, the coefficient of the listed company dummy is not significant in regressions 1 and 3, while not surprisingly, the number of interlocks significantly increases with the number of directors[7].

5.3. Determinants of intra-group interlocking directorates

Insert Table 5 about here

Table 5 reports regression results for intra-group interlocking directorates. To test the hypothesis that companies located at a higher hierarchical level within a group have more interlocking directorates, we include in regression 4 Group Level, which is the hierarchical group level at which the company is situated. For the companies in our sample, the group level ranges between two (the company is a daughter of the top holding company) and five (the company is a great-great-granddaughter of the top holding company)[8]. As the number of hierarchical levels differs between groups, we also include a control variable "No. of Levels in Group", which is the number of levels of the group to which the company belongs. Hypothesis 2 implies that companies situated at a lower hierarchical level have less interlocking directorates. We therefore expect a negative coefficient for the Group Level variable. That is indeed what we find in regression 4: the coefficient of the group level variable is negative and significant at the 1% level, confirming the hypothesis.

[7] The listed company dummy is not included in regression 2 (stand-alone companies) because none of the stand-alone companies in our sample is listed on a stock exchange.

[8] Level one is the ultimate holding company.

Hypothesis 3 posits that group companies participating in an internal capital market have more vertical interlocking directorates than group companies not participating in an internal capital market, because an internal capital market requires central coordination and monitoring. In order to test this hypothesis, we consider the determinants of vertical intra-group interlocking directorates in regression 5. The dependent variable Vertical Interlocks is the number of interlocking directorates of company with parent companies in the group. We include a dummy variable Internal Capital Market as an explanatory variable in this regression. This variable equals one if the company has group receivables and/or group liabilities on its balance sheet, and zero otherwise. Group receivables are long-term and short-term receivables from the group, and group liabilities are long-term and short-term liabilities to the group. In Belgium it is mandatory for companies which have to deposit their financial statement in a complete format at the National Bank of Belgium to report this group financing information in the notes of the financial statement. Hypothesis 3 predicts a positive coefficient for the Internal Capital Market dummy, which is indeed what we find. In regression 5, the coefficient is positive and significant at the 10% level, which suggests that group companies participating in an internal capital market of the group have more vertical interlocks than non-participating companies. As for the other variables, it is interesting to note that while size and leverage are not significantly related to the total number of intra-group interlocks in regression 4, the number of vertical interlocks is positively related to company size and negatively related to leverage in regression 5. These results are in line with the results for the stand-alone companies in our sample.

In regression 6 we investigate whether companies belonging to diversified groups have more vertical interlocks than members of focused groups, by including a “Focused Group” dummy which equals one if the company belongs to a focused group, and zero if the company belongs to a diversified group. The coefficient of the Focused Group dummy in regression 6 is negative

and significant at the 1% level, confirming hypothesis 4 that companies belonging to a diversified group have more vertical interlocks than companies belonging to a focused group. In regression 7 the dependent variable is total intra-group interlocks. Again we find a negative and significant coefficient for the Focused Group Dummy, suggesting that diversified groups have more intra-group interlocks overall than focused groups.

5.4. Interlocking directorates and firm performance

In this section we investigate the effect of interlocking directorates on company performance, again differentiating between stand-alone companies and group companies.

As for stand-alone companies, the resource dependence model of interlocks which views interlocks as facilitators of information flows between the company and its partners and financiers, predicts a positive relation between interlocks and firm performance. Moreover, interlocks may be due to the presence of high quality directors on the board, and the qualities of these directors may also contribute to a higher firm performance. The "busyness hypothesis" on the other hand argues that interlocks *decrease* firm performance, because busy directors who have less time they can dedicate to any one of their mandates are less effective (Shivdasani and Yermack, 1999; Ferris et al., 2003; Fich and Shivdasani, 2006). The empirical evidence on the effect of interlocking directorates on firm performance is mixed. Some studies find a positive effect on performance (e.g. Richardson, 1987; Ferris et al., 2003), while others find no effect (Kiel et al., 2006) or even a negative effect (Loderer and Peyer, 2002; Fich and Shivdasani, 2006). We therefore have no a priori expectation about the impact of interlocks on the performance of the stand-alone companies in our sample.

Regarding the impact of interlocks on the performance of group companies, the resource dependence function of interlocks has been proposed by some authors as a major determinant of intra-group interlocks (Collin, 1998; Keister, 1998; Maman, 1999). Intra-group interlocks may also be exponents of an internal directors' market in business groups (Maman, 2001). Both arguments suggest a *positive* relation between the number of interlocks of individual group members and their performance. Keister (1998) and De (2003) indeed find a positive relationship between profitability and intra-group interlocks in Chinese and Indian business groups. However, intra-group interlocks may also have a *negative* effect on company performance, because interlocks may be used by the ultimate controller of the group as a tool to expropriate value from group members (cf. Meeusen and Cuyvers, 1985; Attig and Morck, 2005; Da Silva et al., 2006).

To test the effect of interlocks on firm performance, we regress future profitability against a set of independent variables. Future profitability is measured by average earnings before interest and taxes divided by total assets over the period 2002-2004. This measure is not affected by the firms' financing decisions, and it captures profitability of the firm as a whole. As a robustness check, we also estimated the performance regressions reported in this paper using the return on equity as an alternative measure of performance, but the results for these regressions are very similar to the ones reported in the paper[9].

The independent variables, which are calculated as of 2001, are taken from Buysschaert et al. (2007). Log(size), leverage, listed company and industry dummies are defined as in section 5.2. We also include *log(age),* which is the logarithm of number of years since the company was

[9] As most companies in our sample are not publicly traded, we cannot use stock market based profitability measures.

established. Older, more stable and mature companies are expected to have lower profitability. *Company growth* is measured by sales growth, which is the logarithm of the ratio of previous year's sales to sales in year t-2. High growth companies are expected to be more profitable. In order to account for the differences in the nature of assets among companies in our sample, we include the ratio of *fixed financial assets* to total assets. Fixed financial assets are shares in other (mainly affiliated) firms, intended to contribute to the activities of the firm that holds them, by establishing a lasting and specific relationship, and loans that were granted with the same purpose. For some firms in our sample such assets are a significant part of total assets.

The regression results are reported in Table 6. We differentiate between stand-alone companies (regression 8) and group companies (regressions 9 to 11). In regressions 8 and 9, interlocks are measured by the logarithm of all interlocking directorates the company has with any other company, in regression 10 they are measured by the logarithm of interlocking directorates with companies belonging to the same group, and in regression 11 by the logarithm of interlocking directorates with parent companies belonging to the same group. To take into account the fact that the interlock measures are endogenous, we estimate two stage least squares regressions.

Insert Table 6 about here

The number of observations available for the performance regressions is reduced to 1,474 stand-alone companies and 190 group companies, because for some firms there was insufficient information on the profitability variable in 2002-2004 and/or on the additional independent variables in 2001. Moreover, in order to obtain economically meaningful estimates of the determinants of profitability, for the years 2002-2004 we only considered company-year observations which fulfilled the following criteria: (1) the company had to have a "normal"

legal status, (2) the age of the company had to be at least one, and (3) sales and total assets had to be positive. Furthermore, in each year we also removed the company-year observations with the highest or lowest 1% outlying values for the performance measure from the sample, in order to exclude outliers.

Regression 8 estimates the determinants of profitability for stand-alone companies. In this regression, the coefficient of log(all interlocks) is negative and significant at the 5% level, which suggests that interlocks are negatively related to the performance of stand-alone companies. This is consistent with results of Loderer and Peyer (2002) and Fich et al. (2006), who also find a negative relation between interlocking directorates and company performance. One explanation for this negative relation proposed in the literature is that busy directors can dedicate less time to the company, and are therefore less effective. An alternative explanation would be that badly performing companies have more representatives of financial institutions on their board. In that case it is performance which affects the number of interlocks, and not *vice versa*. In principle we control for causality by considering the effect of interlocks in 2001 on *future* performance, but company performance may (to some extent) be persistent through time.

In regressions 9 to 11, we consider the effect of all interlocks, intra-group interlocks and vertical interlocks on the performance of group companies. In all three regressions the (endogenous) interlock measure is positive but insignificant. This result suggests that interlocking directorates do not hurt performance of group members: directors in Belgian business groups are not “too busy”, and intra-group interlocks are not facilitators of expropriation by controlling shareholders. The result is also consistent with the idea that groups tend to make optimal use of

interlocks in equilibrium: group members with more interlocks do not perform better (or worse)[10].

Our results do not confirm the finding of Meeusen and Cuyvers (1985) that interlocks with a holding company were negatively related to the performance of Belgian companies in 1976. However, it should be taken into account that the environment in which companies operated at that time was very different from the environment today: investors in Belgium are nowadays much better protected than they were in 1976. Moreover, the results of Meeusen and Cuyvers are based on a limited sample of 200 large companies, while our sample is much larger and includes smaller companies, most of which are not listed on a stock exchange.

6. Conclusions

Our results, based on a sample of 286 companies affiliated with a business group and 2,136 stand-alone companies, show that companies belonging to a group have much more interlocking directorates than stand-alone companies. Stand-alone companies have more interlocking directorates if they are larger, if they have a lower debt ratio, and if they are less profitable. Group companies tend to be strongly interlocked with other group members, including parent companies. Moreover, they have more intra-group interlocks when they are located at a higher hierarchical group level, consistent with the hypothesis of an internal directors' market in the group. We also find that group companies involved in an internal capital market and companies belonging to a diversified business group have more vertical interlocking directorates than other group companies, confirming the hypothesis internal markets in the group require central

[10] Alternatively, intra-group interlocks may simply not matter for performance. However, this seems unlikely, given the very large number of interlocks between group companies.

coordination and monitoring. While interlocking directorates are negative related to the profitability of stand-alone companies, they do not affect the profitability of group companies. This suggests that directors in Belgian business groups are not "too busy", and that intra-group interlocks are not facilitators of expropriation by controlling shareholders. Combined, our results reveal that interlocking directorates play an important role in Belgian business groups, and that the function of these interlocks depends on the role the interlocked companies play in the group and on the nature of the group.

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Table 1

Groups Represented in the Sample

	Holding Company	No. of companies on which interlocks are based	No. of companies in sample	Consolidated total assets (in 1,000 €)	No. of group levels	Diversified or focused
1	Accentis	26	24	64,350	2	F
2	Ackermans en Van Haaren	100	66	1,007,952	4	D
3	Almanij	80	42	3,788,864	5	F
4	Atenor	17	10	103,890	2	D
5	Auximines	8	5	398,615	4	D
6	Bois Sauvage	4	2	329,217	2	D
7	Compagnie Benelux Paribas	53	35	3,448,940	4	D
8	Compagnie Nationale à Portefeuille	48	37	2,662,060	3	D
9	Deficom	4	2	78,739	2	F
10	Financière de Tubize	11	7	486,999	4	F
11	Floridienne	7	7	35,275	2	D
12	Mitiska	25	21	117,005	3	F
13	SCF	3	3	41,924	2	F
14	Société Financière des Caoutchoucs	8	5	51,543	2	F
15	Sofina	5	1	1,280,445	2	D
16	Solvac	15	14	206,056	3	D
17	Unibra	8	5	66,611	2	D
	Total:	422	286			

This table reports the characteristics of the 17 business groups included in the sample.

Table 2

Interlocking Directorates and Interlocked Companies

Panel A: Interlocks of 286 Group Companies

	Absolute Number		Density	
	Mean	Median	Mean	Median
Number of Company Directors	4.48	4		
Interlocking Directorates				
▪ All	15.82	11	0.12%	0.09%
▪ Intra-Group	13.78	9.5	10.12%	5.06%
▪ With Parent Companies	2.32	1	10.55%	1.67%
▪ With Companies Belonging to Other Groups	1.33	0	0.06%	0.00%
▪ With Stand-Alone Companies	0.71	0	0.00%	0.00%
Interlocked Companies				
▪ All	9.97	7	0.32%	0.23%
▪ Intra-Group	8.13	6	22.79%	16.91%
▪ Parent Companies	1.39	1	25.90%	10%
▪ Companies Belonging to Other Groups	1.20	0	0.34%	0.00%
▪ Stand-Alone Companies	0.64	0	0.02%	0.00%
Panel B: Interlocks of 2,136 Stand-Alone Companies				
N umber of Company Directors	4.91	3		
Interlocking Directorates				
▪ All	1.22	0	0.01%	0.00%
▪ With Group Companies	0.10	0	0.00%	0.00%
▪ With Stand-Alone Companies	1.11	0	0.00%	0.00%
Interlocked Companies				
▪ All Companies	0.80	0	0.03%	0.00%
▪ Group Companies	0.10	0	0.02%	0.00%
▪ Stand-Alone Companies	0.70	0	0.03%	0.00%

Table 3

Descriptive Statistics

	286 Group Companies			2,136 Stand-Alone Companies			
	Mean	Median	St.dev.	Mean	Median	St.dev.	Difference in Means
Log(Size)	9.377	9.346	2.080	8.617	8.551	1.336	***
Leverage	0.563	0.597	0.364	0.684	0.748	0.287	***
Profitability 1999-2001	0.023	0.023	0.100	0.022	0.021	0.030	n.s.
Log(Number of Directors)	1.327	1.386	0.591	1.183	1.099	0.790	***

This table reports descriptive statistics for a sample of 286 group companies and 2,136 stand-alone companies in 2001. *Log(size)* is the log of total assets; *leverage* is the ratio of total debt to total assets; *profitability 1999-2001* is average EBIT/total assets in 1999-2001; log(number of directors) is the log of the number of directors of the company. * denotes significance at the 10% level; ** denotes significance at the 5% level; *** denotes significance at the 1% level

Table 4

Determinants of Interlocking Directorates – Group Companies versus Stand-alone Companies

Regression:	(1)	(2)	(3)
Sample:	All Companies	Stand-Alone Companies	Group Companies
Constant	-2.555*** (0.000)	-2.844*** (0.000)	1.022** (0.012)
Group Company	2.781*** (0.000)		
Log(Size)	0.083*** (0.002)	0.118*** (0.001)	0.024 (0.437)
Leverage	-0.249** (0.046)	-0.367** (0.030)	-0.096 (0.543)
Profitability 1999-2001	-0.832 (0.181)	-0.454* (0.096)	0.766 (0.255)
Listed Company	-0.424 (0.279)		-0.235 (0.350)
Log(Number of Directors)	1.070*** (0.000)	1.100*** (0.000)	0.950*** (0.000)
R^2	0.489	0.305	0.348
No. of observations	2,422	2,136	286

This table reports results of negative binomial regressions for a sample of 2,484 companies in 2001. The dependent variable is the number of director interlocking directorates the company has; *group company* is a dummy which equals one if the company belongs to a group, and zero otherwise; *log(size)* is the log of total assets; *leverage* is the ratio of total debt to total assets; *profitability 1999-2001* is average EBIT/total assets in 1999-2001; *listed company* is a dummy which equals one if the company is listed, and zero otherwise; *log(number of directors)* is the log of the number of directors of the company. All regressions include industry dummies. *P*-values, based on heteroscedasticity-consistent standard errors are in parentheses below each coefficient; * denotes significance at the 10% level; ** denotes significance at the 5% level; *** denotes significance at the 1% level.

Table 5

Determinants of Intra-Group Interlocking Directorates

Regression:	(4)	(5)	(6)	(7)
Dependent Variable:	Intra-Group Interlocks	Vertical Interlocks	Vertical Interlocks	Intra-Group Interlocks
Constant	2.645*** (0.000)	-1.807*** (0.002)	-1.351** (0.018)	2.135*** (0.000)
No. of Levels in Group	0.178* (0.098)			
Group Level	-0.493*** (0.000)			
Internal Capital Market		0.419* (0.079)		
Focused Group			-0.552*** (0.002)	-0.343*** (0.005)
Log(Size)	0.030 (0.306)	0.265*** (0.000)	0.269*** (0.000)	0.016 (0.597)
Leverage	-0.222 (0.164)	-0.769*** (0.002)	-0.708*** (0.005)	-0.199 (0.221)
Profitability 1999-2001	-0.204 (0.772)	0.200 (0.846)	0.101 (0.921)	0.067 (0.925)
Listed Company	-0.671*** (0.010)	-0.356 (0.289)	-0.330 (0.324)	-0.483* (0.068)
Potential Interlocks	0.002*** (0.000)	0.013*** (0.000)	0.014*** (0.000)	0.002*** (0.000)
R^2	0.384	0.343	0.382	0.361
No. of observations	286	286	286	286

This table reports results of negative binomial regressions for a sample of 286 group companies in 2001. *Intra-group interlocks* is the number of interlocking directorates the company has with companies belonging to the same group; *vertical interlocks* is the number of interlocking directorates the company has with parent companies belonging to the same group; *no. of levels in group* is the number of hierarchical levels in the group; *group level* is the hierarchical level at which the company is situated; *internal capital market* is a dummy which equals one if the company has intra-group payables or intra-group receivables, and zero otherwise; *focused group* is a dummy which equals one if the company belongs to a focused group, and zero otherwise; *log(size)* is the log of total assets; *leverage* is the ratio of total debt to total assets; *profitability 1999-2001* is average EBIT/total assets in 1999-2001; *listed company* is a dummy which equals one if the company is listed, and zero otherwise; *potential interlocks* is the number of company directors times the number of (parent) companies belonging to the same group. All regressions include industry dummies. *P*-values, based on heteroscedasticity-consistent standard errors are in parentheses below each coefficient; * denotes significance at the 10% level; ** denotes significance at the 5% level; *** denotes significance at the 1% level.

Table 6

Determinants of Profitability

Regression:	(8)	(9)	(10)	(11)
Sample:	Stand-Alone Companies	Group Companies	Group Companies	Group Companies
Constant	0.410 (0.793)	-3.957 (0.274)	-3.607 (0.326)	-2.634 (0.564)
Log(All Interlocks)	**-1.100**** **(0.029)**	**1.035** **(0.391)**		
Log(Intra-Group Interlocks)			**0.255** **(0.789)**	
Log(Vertical Interlocks)				**0.741** **(0.753)**
Log(size)	0.379* (0.051)	0.902*** (0.003)	0.961*** (0.001)	0.876** (0.046)
Log(Age)	-0.202 (0.236)	-0.043 (0.941)	-0.079 (0.889)	0.059 (0.919)
Leverage	-0.991 (0.125)	-2.876*** (0.006)	-2.864*** (0.004)	-2.845*** (0.005)
Sales Growth	0.893*** (0.006)	0.363 (0.543)	0.410 (0.469)	0.437 (0.456)
Financial Fixed Assets	5.476*** (0.005)	1.263 (0.453)	1.489 (0.365)	1.389 (0.419)
Listed Company		-4.318 (0.391)	-3.942 (0.200)	-4.063 (0.187)
R^2	0.035	0.227	0.240	0.230
No. of observations	1,474	190	190	190

This table reports results of two stage least squares regressions for a sample of 1,474 stand-alone companies and 190 group-companies. All variables are based on data for 2001, except the dependent variable *profitability*, which is the average EBIT/total assets in 2002-2004 (expressed as a percentage). *Log(all interlocks)* is the log of all interlocks the company has with other companies; *log(intra-group interlocks)* is the log of all interlocks the company has with companies belonging to the same group; *log(vertical interlocks)* is the log of interlocks the company has with parent companies belonging to the same group; *log(size)* is the log of total assets; *log(age)* is the log of the number of years since the company was established; *leverage* is the ratio of total debt to total assets; *sales growth* is log [sales in 2001 / sales in 2000]; *financial fixed assets* is the ratio of financial fixed assets over total assets; *listed company* is a dummy which equals one if the company is listed, and zero otherwise. All regressions also include industry dummies. *P*-values, based on heteroscedasticity-consistent standard errors are in parentheses below each coefficient; * denotes significance at the 10% level; ** denotes significance at the 5% level; *** denotes significance at the 1% level.