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WORKING PAPER

The Agency Model as a Predictor of the Size of the Internal Audit Function in Belgian Companies

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April 2007

2007/458

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Abstract

This study contributes to the literature by using an agency model to explain the size of internal audit functions in a non-Anglo-Saxon environment. Data to test this model were collected from annual reports and a questionnaire sent to Chief Audit Executives. The results show that the agency model has high explanatory power and reveals that the more diffused the ownership structure of the company, the larger the company and the more reporting levels within the company, the larger the internal audit function. The results of this study confirm the growing monitoring role of internal auditing in contemporary corporate governance.

Keywords: internal auditing, Belgium, agency theory, questionnaire, annual report.

Acknowledgements: This paper has benefited from the comments and suggestions of Ann Vanstraelen (University of Antwerp and University of Maastricht), Mohammed J. Abdolmohammadi (Bentley College), Priscilla Burnaby (Bentley College), Patricia Everaert (Ghent University), Werner Bruggeman (Ghent University) and Ignace De Beelde (Ghent University). This paper has been accepted for presentation at the 30th Annual Conference of the European Accounting Association (Lisbon, 25-27 April 2007).

Introduction

Despite all of the recent attention focused on the internal audit function as one of the crucial parties within corporate governance (Carcello et al., 2005b), little is known about the factors explaining the size of the internal audit function. Why do some companies have a large internal audit function, while others do not? This is especially relevant in continental Europe, where internal auditing is still a relatively young profession and where corporate governance requirements are less stringent than they are in the Anglo-Saxon world (Sarens and De Beelde, 2006a). Therefore, this study attempts to explain the size of the internal audit function within Belgian companies. Following Willekens et al. (2004), it can be argued that Belgium is representative of a non-Anglo-Saxon environment. At the time of this study, Belgian companies, with the exception of those listed on the New York Stock Exchange (NYSE), were not mandated to install an internal auditing function.

The literature is replete with studies that have used agency theory to examine the role of external auditing (e.g. DeAngelo, 1981, Watts and Zimmerman, 1983). The provision of audited financial statements has been confirmed to be a cost-effective contractual response to agency costs. Similarly, internal auditing may also serve as a monitoring response to agency costs (Anderson et al., 1993; DeFond, 1992). Relatively few studies have used agency theory to explain the importance of internal auditing (Adams, 1994). Given the insights from the studies indicating the relevance of agency variables in explaining monitoring through auditing, this study adopts a traditional agency model to explain the size of the internal audit function in a continental European environment. Few studies have investigated voluntary demand for internal auditing (Anderson et al., 1993; Carey et al., 2000; Wallace and Kreutzfeldt, 1991) and the present study accordingly adds to this literature. From a practical

point of view, companies can use the model tested in this study to decide on the size of their internal audit function, a question that is highly relevant in today's business environment (Carcello et al., 2005b). The results of this study confirm the explanatory power of agency variables such as diffusion of ownership, company size and the number of reporting levels.

The following section of this paper develops hypotheses for the agency model based on a review of the relevant literature. The third section outlines the methodology of this study. The fourth section shows the empirical results. The paper ends with a summary and discussion of the conclusions.

Literature Review and Development of Hypotheses

Agency theory postulates that a company consists of a nexus of contracts between the owners of economic resources (the principals) and managers (the agents) who are charged with using and controlling those resources (Jensen and Meckling, 1976). Agency theory is based on the idea that agents have more information than principals and that this information asymmetry adversely affects the principals' ability to monitor whether or not their interests are being properly served by agents. It also assumes that principals and agents act rationally and that they will use the contracting process to maximise their wealth. This means that because agents have self-seeking motives, they are likely to take the opportunity to act against the interests of the owners of the company. Jensen and Meckling (1976) refer to this dilemma as the moral hazard problem. Another type of agency problem is adverse selection. This occurs when the principal does not have access to all available information at the time a decision is made by an agent, and is thus unable to determine whether the agent's actions are in the best

interests of the firm. To ensure the so-called pareto-optimality in the contracting process, both principals and agents will incur contracting costs.

Sherer and Kent (1983) and Watts (1988) suggest that internal auditing is a bonding cost borne by agents to satisfy the principals' demands for accountability. The cost of internal auditing can also be judged to be a monitoring cost which is incurred by principals to protect their economic interests. Agency theory contends that internal auditing, like other intervention mechanisms like financial reporting and external auditing, helps to maintain cost-efficient contracting between owners and managers. Adams (1994) illustrates that agency theory helps to explain the existence of internal auditing in companies but can also help to explain an important characteristic of the internal audit function, namely its size. It is assumed that the more information asymmetry, the greater the need for monitoring to reduce this information asymmetry, resulting in a larger internal audit function. In a larger internal audit function, there will be more staff and, the scope of the internal audit work covered would be greater than in a smaller function (Mat Zain et al., 2006). It is assumed that a larger internal audit function has a broader scope of work and is able to cover more areas where (potential) information asymmetries exist. In the following paragraphs, hypotheses will be developed based on the principal/agent problem that exists between the owners of resources (shareholders and debtholders) and the users of resources (management).

Diffusion of Ownership

Based on studies done by DeFond (1992) and Francis and Wilson (1988), explaining the implications of the separation of ownership and control, it can be argued that the more diffused the ownership of the company, the higher the divergence in preferences of the owners and managers and the lower the observability and control of management's actions by

the owners. As the diffusion of ownership increases, it is expected that a greater demand for monitoring will be exhibited through a larger internal audit function to monitor the owners' interests. This is reflected in Hypothesis One.

Hypothesis 1: The larger the diffusion of ownership, the larger the internal audit function.

Management Share Ownership

DeFond (1992) argues that the greater the ownership interest of managers, the more closely aligned their preferences are with those of the outside owners. Since owner-managers have an opportunity for entrepreneurial gains, they have incentives to increase the value of the firm rather than shirk (Francis and Wilson, 1988). Although the current popularity of stock-based compensation (Bolton et al., 2006), managers typically own only a relatively small portion of the organisation's shares. They have more incentives to allocate resources in ways that are not necessarily consistent with the interests of non-managing shareholders (Chow, 1982). In Hypothesis Two it is expected that the smaller the managers' ownership of shares, the greater the demand for monitoring, resulting in a larger internal audit function.

Hypothesis 2: The smaller management's share ownership, the larger the internal audit function.

Leverage

Similar to the principal/agent problem between shareholders and management, Jensen and Meckling (1976) argue that the same problem arises out of conflicting incentives of debtholders and management (see also DeFond, 1992). It is argued that as the proportion of debt in a company's capital structure increases, it becomes more likely that the organisation

will need monitoring through auditing (cf. Chow, 1982; Francis and Wilson, 1988). Previous research (Abdel-Khalik, 1993; Blackwell et al., 1998; Chow, 1982) supports a positive association between the level of debt and the demand for external auditing. This result is based on the importance of accounting numbers in debt covenants, reducing the information asymmetry between debtholders and management, and the monitoring role of external auditing with respect to the reliability of these accounting numbers. Watts and Zimmerman (1986) indicate that auditor assurance reduces lenders' monitoring costs. To the extent that debt contracts increase the need for external auditing, Carcello et al. (2005a) recently found that this increased need for monitoring also affects a company's investment in internal auditing. Given the focus of internal audit's work, reviewing different types of internal controls (including financial controls), and the direct or indirect impact this has on the reliability of accounting numbers, it is assumed that a positive relationship exists between the proportion of debt and the size of the internal audit function, resulting in Hypothesis Three.

Hypothesis 3: The higher the proportion of debt, the larger the internal audit function.

Company Size

Fama (1980) utilised agency theory to examine the hierarchical relationships that exist *within* large, divisionalised companies. In this context, the company's top management is viewed as the principal who delegates responsibility and authority to subordinate managers (agents) for effective utilisation of a portion of the firm's resources, leading to moral hazard problems between both levels. Top management would attempt to mitigate this moral hazard problem through available organisational controls including internal auditing (San Miguel et al., 1977). Previous empirical studies have identified a correlation between company size and the demand for both external and internal auditing (e.g. Carcello et al., 2005a). A number of

explanations have been suggested. Chow (1982) indicated that as the total amount of potential wealth transfers increases with company size, the related benefits from monitoring increase. Abdel-Khalik (1993) suggests that with increased size it becomes more difficult for principals, in this case top management, to oversee and be cognizant of the enterprise, which creates a greater demand for internal auditing to compensate for the loss of control. On the cost side, larger companies have opportunities to take advantage of economies of scale when investing in the fixed costs of an internal audit function (Anderson et al., 1993). Once the internal audit function has been established, the marginal cost of its operation is likely to decrease with company size. This leads to Hypothesis Four which relates the size of the company to the size of the internal audit function.

Hypothesis 4: The larger the company, the larger the internal audit function.

Number of Reporting Levels

In a small company with only one level of hierarchy, operations are primarily controlled by means of direct supervision and personal observation. As the company grows, multilayered hierarchies evolve and authority is often delegated down the chain of command (Abdel-Khalik, 1993). The reduced observability in hierarchies can cause loss of control (Williamson, 1967; Williamson and Ouchi, 1981). First, observability of subordinates' actions decreases as the chain of command gets longer. Second, the longer the chain of command, the more likely that communication will become distorted (Katz and Kahn, 1966). Third, communication down the chain of command passes through several filters, which subject it to summarisation, misinterpretation, and possible intentional manipulation (Williamson and Ouchi, 1981). Williamson (1967) argues that as the number of hierarchical

levels in the company increases, the demand for monitoring grows, resulting in a larger internal audit function as reflected in Hypothesis Five.

Hypothesis 5: The larger the number of reporting levels within the company, the larger the internal audit function.

Geographical Dispersion of the Activities

Carcello et al. (2005a) suggest that increased organisational complexity resulting from a larger number of foreign subsidiaries, is associated with greater decentralisation, which in turns leads to a greater demand for monitoring. Wallace and Kreutzfeldt (1991) found evidence that a more decentralised company will have a greater propensity to establish an internal audit function. The number of countries in which the company has subsidiaries or operating units is a proxy for the extent of control loss. Based on these findings, the following hypothesis can be formulated:

Hypothesis 6: The larger the number of different countries in which the company has a subsidiary, the larger the internal audit function.

Exhibit 1 depicts the assumed relationship between the six agency variables and the size of the internal audit function.

[INSERT EXHIBIT 1 HERE]

Methodology

Target Population

Contrary to most research in this area (e.g. Wallace and Kreutzfeldt, 1991) focusing on the existence of internal auditing, this model explains the size of the internal audit function within Belgian companies. The target population excludes those Belgian companies that do not have an internal audit function, and consists of companies that are known to have an internal audit function, based on the membership database of the Belgian Institute of Internal Auditors (IIABEL). This results in a target population of 260 companies. One can argue that we excluded those Belgian companies that have an internal audit function, but that are not a member of IIABEL. The Belfirst database (Bureau Van Dijk)² was used to develop a list of all companies, excluding banks and insurance companies, with more than 1,000 employees. Given previous research on internal auditing in Belgium (Sarens and De Beelde, 2006a; 2006b), these companies can reasonably be expected to have an internal audit function. A list of 175 companies resulted that was almost completely represented by the membership database of IIABEL. So, it can be concluded that the target population is representative for the group of Belgian companies with an internal audit function.

Data Collection

The data collection for this study consisted of two parts. First, some relevant questions related to agency variables were incorporated into a broader questionnaire on internal auditing practices in Belgium. This questionnaire was sent out in November 2005 to the head of the internal audit department of all 260 companies from our target population. By March 2006,

² The Belfirst database contains the annual accounts of approximately 300,000 Belgian companies.

after an intensive follow-up by e-mail and phone³, 85 questionnaires were returned. This represents an overall response rate of 32.69 percent. A first review revealed 12 questionnaires with many missing values. Consequently, these were excluded from further analysis, yielding 73 usable questionnaires. This represents 28.08 percent of the target population, which is similar to recent studies in this area (e.g. Carcello et al., 2005a, Mat Zain et al., 2006).

Second, for the 73 companies that returned a usable questionnaire, archival data were collected from their 2005 annual report from the Belfirst database (for Belgian companies), Amadeus database (for Belgian subsidiaries of a company located in another European country), both issued by Bureau Van Dijk, or a manual investigation of the annual report (for Belgian subsidiaries of a US-based company).

Non-Response Bias

To detect a possible non-response bias, Armstrong and Overton (1977) suggest comparing key constructs between early and late respondents⁴. The analysis reveals no significant differences in terms of number of employees ($p = .702$) and total assets ($p = .109$) between early and late respondents. Comparison of the dependent and independent variables shows only one significant difference between early and late respondents. More specifically, management share ownership (independent agency variable) is significantly higher within the group of late respondents ($p = .007$). Including a dummy variable for late respondents in the regression analysis did not change the results; the dummy variable itself was not significant ($p > .05$) in the agency model. It can be concluded that the data do not suffer from a non-response bias.

³ We gratefully acknowledge the assistance of IIABEL in this part of the data collection.

⁴ We consider those respondents returning their questionnaire during the last week of the data collection, who lasted 18 weeks in total, as 'late respondents'.

Variable Measurement

Dependent Variable

The number of internal auditors within the internal audit function (FTE) is the dependent variable in the OLS regression analysis. A closer investigation of the histogram of this variable reveals a strong positively skewed distribution, and an examination of the residuals of the regression analysis indicates a problem of heteroscedasticity. As recommended by Hair et al. (2005), the dependent variable was transformed by computing the logarithm of the number of internal auditors to solve this problem. We are convinced that this corrective action will increase both the predictive accuracy of both models and the validity of the estimated coefficients. The dependent variable should be interpreted as a measure of proportional change in the size of the internal audit function.

Control Variables

The New York Stock Exchange (NYSE) requires all listed companies to have an internal audit function, although it does not address the nature or effectiveness of the internal audit function (SEC, 2003). Therefore, it can be reasonably expected that, due to these institutional requirements (cf. also Chow, 1982), within NYSE listed companies, the size of the internal audit function will be significantly higher. Those Belgian companies that are directly listed on the NYSE or whose parent company is NYSE listed are controlled by including a dummy variable. Some industries face substantial regulatory scrutiny that may increase the importance of internal auditing (Wallace and Kreutzfeldt, 1991). For example, financial institutions are highly regulated and have compliance risks that exceed those in many other industries (Basel Committee, 2001). Therefore, those companies operating in the financial sector (banks and insurance companies) are controlled by including a dummy variable. It can

be reasonably expected that these companies will have a larger internal audit function. Data for both control variables were collected through the questionnaire.

Independent Variables

Consistent with Francis and Wilson (1988), the *diffusion of ownership* is measured by the largest individual percentage of stock ownership at the end of 2005. The smaller this percentage, the more diffused the ownership structure. This percentage is obtained from the annual report. The questionnaire also asks for this percentage, which is only used if the annual report did not contain the information. *Management share ownership* is measured by the percentage of shares that was owned by managers at the end of 2005 (cf. Chow, 1982). For non-US companies, we asked the respondents for an exact figure or an approximation, as this percentage is rarely disclosed in the annual report. Following Carey et al. (2000) and Chow (1982), *leverage* is measured as the proportion (percent) of total debt compared to total assets. Following Carcello et al. (2005a), DeFond (1992) and Francis and Wilson (1988), replacing total debt by long-term debt leads to the same results. These data were obtained from the 2005 annual report.

Consistent with previous research, total assets as reported in the 2005 annual report are used to measure *company size* (cf. Carey et al., 2000; Chow, 1982; Wallace and Kreutzfeldt, 1991). Given the non-linear relationship between total assets and the number of internal auditors, the logarithm of total assets reflects a more reliable measure (see also Blackwell et al., 1998; Carcello et al., 2005a). The respondents were asked to specify the *number of reporting levels* between top management and the lowest operating unit, and the *number of different countries* in which their company has one or more subsidiaries or operating entities.

Common Methods Variance Bias

According to Hair et al. (2005), common methods variance bias can emerge when dependent and independent variables all come from a single respondent. In order to avoid this bias, two countermeasures were taken. First, the dependent variable (number of internal auditors) is an objective measure rather than a perception. Second, some of the independent agency variables were obtained from a secondary source (annual report).

Model Specification

An OLS regression analysis will be performed to test the agency model (expected signs are between brackets):

$$\text{Ln (Number_IA)} = a_0 + a_1 \text{ Finance} + a_2 \text{ NYSE} + a_3 \text{ Dif_Owner} + a_4 \text{ Mgt_Stocks} + a_5 \text{ Leverage} + a_6 \text{ Ln (Total_Assets)} + a_7 \text{ Report_Level} + a_8 \text{ Countries}$$

Dependent variable:

Ln (Number_IA)	Size of the internal audit function measured by the logarithm of the number of internal auditors (FTE)
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Control variables

Finance (+)	Company operates in the financial industry (bank or insurance company): Dummy variable (0/1)
NYSE (+)	Company or parent company is listed on the NYSE: Dummy variable (0/1)

Independent variables

Dif_Owner (-)	Diffusion of ownership measured by the largest individual percentage of stock ownership
Mgt_Stocks (-)	Management share ownership measured by the percentage of shares owned by managers
Leverage (+)	Leverage measured by the proportion of total debt compared to total assets
Ln (Total_Assets) (+)	Company size measured by the logarithm of total assets
Report_Level (+)	Number of reporting levels between top management and the lowest operating unit
Countries (+)	Number of different countries in which the company has one or more subsidiaries or operating units

Empirical Results

Descriptive Statistics and Correlations

Panel A of Table 1 shows a breakdown of the respondents by industry. It is apparent that almost one third (32 percent) of the respondents comes from the production, energy and utility sector, whereas one fourth (26 percent) of the respondents operates in the financial sector (bank or insurance company). Panel B of Table 1 indicates that 22 percent of the responding companies (or their parent company) is listed on the NYSE. Table 2 gives an overview of the descriptive results for the dependent and independent variables and indicates substantial variability. Table 3 shows the correlations and reveals no substantial indication of collinearity between the independent variables. All tolerance values are higher than 0.58, which is above the common cut-off threshold. All variance inflation factor values are lower than 1.74, and are below the threshold (Hair et al., 2005). Hence, multi-collinearity is not a significant problem.

[INSERT TABLE 1 HERE]

[INSERT TABLE 2 HERE]

[INSERT TABLE 3 HERE]

OLS Regression Analysis

The first OLS regression analysis only includes the two control variables and has an F-value of 7.788 ($p = .001$) explaining 16 percent of the variance in the proportional change of the size of the internal audit function. It is clear that the internal audit function is significantly larger in companies who are listed (or their parent company) on the NYSE stock exchange. It

should be noted that this variable remains significant in the agency model which confirms the strong influence of institutional requirements (Chow, 1982).

The second OLS regression analysis, testing the agency model, has an F-value of 22.011 ($p < .001$) and explains 70 percent of the variance in the proportional change of the size of the internal audit function, which is relatively high compared to previous studies using these variables (Anderson et al., 1993; Carcello et al., 2005a; Carey et al., 2000; Chow, 1982). It becomes clear that agency variables explain to a high extent the size of the internal audit function in Belgian companies. This OLS regression analysis supports the following hypotheses:

Hypothesis 1: The larger the diffusion of ownership, the larger the internal audit function.

The OLS regression analysis reveals a highly significant ($p < .01$) negative coefficient, indicating that the smaller the individual stake of the largest shareholder, the larger the internal audit function.

Hypothesis 4: The larger the company, the larger the internal audit function.

The OLS regression analysis shows a highly significant ($p = .000$) positive coefficient, indicating that the larger the company, the larger the internal audit function.

Hypothesis 5: The larger the number of reporting levels within the company, the larger the internal audit function.

The OLS regression analysis indicates a highly significant ($p < .01$) positive coefficient, thereby confirming that the larger the hierarchical distance between top management and the

lowest operating unit, the larger the internal audit function to compensate for the loss of control at top level.

[INSERT TABLE 4 HERE]

Additional Analysis

Given the institutional requirements, one could wonder whether the agency variables are significantly different between the regulated companies (financial or NYSE-listed) and non-regulated companies (non-financial or non-NYSE listed). Some additional univariate significance tests (ANOVA) were performed, revealing interesting differences. Table 5 shows that financial companies (banks and insurance companies) and NYSE-listed companies are significantly larger ($p < .05$), in terms of total assets, than their non-regulated counterparts. Financial companies seem to have significantly less reporting levels ($p < .05$) than non-financial companies and are significantly less geographically dispersed ($p = .006$). In contrast, NYSE-listed companies have significantly more reporting levels ($p < .05$) than non-NYSE listed companies. Furthermore, financial companies have a significantly higher leverage ($p = .000$) than non-financial companies.

Contrary to what one might expect, the internal audit function is not significantly larger within financial companies ($p = .192$) than in non-financial companies. When comparing the size of the internal audit function between NYSE-listed companies and non-NYSE listed companies, it is revealed that the internal audit function is significantly ($p < .01$) larger in the former group.

[INSERT TABLE 5 HERE]

Discussion and Conclusion

Complementary to previous studies applying agency theory to explain the existence of internal auditing in companies, this study illustrates that agency theory is also a relevant framework to explain the size of the internal audit function in those companies who already have an internal audit function (Adams, 1994). It can be argued that a larger internal audit function has a broader coverage in their audit work, and therefore, is better able to reduce the information asymmetries and resulting loss of control that is inherent to modern companies. In this study, a distinction was made between the principal/agent problem between the owners of resources (shareholders and debtholders) and the users of resources (management) on the one hand, and between those who delegate responsibilities within the company (top management) and those who take these responsibilities (lower managers) on the other hand. With respect to the first principal/agent problem, it is confirmed that companies with a more diffused ownership structure have a larger internal audit function. This confirms that internal auditing can be considered as a basic monitoring mechanism to reduce the information asymmetry resulting from the separation of ownership and control (Francis and Wilson, 1988; DeFond, 1992). As this separation is considered as the basic principle behind the demand for corporate governance, this result confirms the growing importance of internal auditing's monitoring role in contemporary corporate governance (Carcello et al., 2005b).

Contrary to the hypothesis, the coefficient in the regression analysis suggests a negative relationship between the leverage and the size of the internal audit function. Contrary to Carcello et al. (2005a), it seems that in this sample internal auditing is not playing a major monitoring role in the contracting relationship between debtholders and management. This confirms, to some extent, previous research demonstrating the important monitoring role of

external auditing in this agency conflict (Abdel-Khalik, 1993; Blackwell et al., 1998; Chow, 1982). It seems logical that the external auditor has a more valuable role to play when it comes to monitoring the reliability of the accounting numbers. This is consistent with the current scope of internal auditing in a non-Anglo-Saxon environment, focusing more on evaluating operations and processes, with a less dominant focus on the reliability of financial numbers (Sarens and De Beelde, 2006a). Further research could validate this by investigating whether a higher leverage leads to a higher importance of external auditing, reflected by higher audit fees, and whether these higher audit fees can be associated with a smaller internal audit function.

Furthermore, the results demonstrate that internal auditing is a relevant monitoring mechanism to reduce the internal principal/agent problem (cf. Fama, 1980), thereby confirming San Miguel et al. (1977). Given recent corporate governance requirements, top managers are assigned with increased monitoring responsibilities in order to demonstrate that they have the company 'under control'. In this context, the internal principal/agent problem and the resulting need for monitoring become strongly relevant. Testing the agency model reveals that larger companies and companies with more reporting levels, coping with more potential moral hazard problems between top management and lower managers, have larger internal audit functions.

This result confirms the important relationship between company size and the demand for monitoring through internal auditing to compensate for the loss of control (Abdel-Khalik, 1993). This also suggests that larger companies are better able to take advantage of the economies of scale when investing in the fixed costs of an internal audit function (Anderson et al., 1993). This result also illustrates that the longer the chain of command within the

company, the more valuable internal auditing becomes to enhance observability of subordinates' actions and avoid distorted communication (Katz and Kahn, 1966; Williamson and Ouchi, 1981). In these companies, it can be argued that top managers are more confronted with their own limitations, resulting from information asymmetries, in monitoring the company. The internal audit function seems to be the partner of top management in monitoring the company. The internal audit function, focused on monitoring the internal controls and operations at different levels in the company, provides top management with an important assurance, which enables them to assume their monitoring responsibilities.

It became clear that NYSE-listed companies have significantly larger internal audit functions. Consequently, it can be concluded that institutional requirements in the U.S., stressing the importance of internal auditing, clearly contribute to the recognition and development of the profession. One could wonder whether making an internal audit function also mandatory for European listed companies would elevate the status of the internal auditing profession in continental Europe. Belgium has recently taken some preliminary initiatives in this direction.

It can be concluded that, apart from company size, the diffusion of ownership and the number of reporting levels within the company have the most significant influence on the size of the internal audit function. Additional analysis indicated that some agency variables between regulated and non-regulated companies are significantly different. On the one hand, it was suggested that financial companies encounter more external principal/agent problems given that they were larger and have a higher leverage than their non-financial counterparts. On the other hand, it can be assumed that they encounter less internal principal/agent problems given the lower number of reporting levels and the more limited geographical dispersion of their activities. NYSE-listed companies were larger than their non-NYSE listed counterparts, but

have more reporting levels and a wider geographical dispersion of their activities, which leads to the assumption that internal principal/agent problems are more prevalent in this sub-group. Given these interesting differences, further research, building upon a larger number of observations, could test the extent to which the influence of these agency variables on the size of the internal audit function varies between regulated and non-regulated companies.

Limitations

Despite the interesting insights revealed by the agency model, this study has some limitations. Although yielding a reasonable response rate, the absolute number of respondents remains rather low, especially when this group is split into several sub-groups for more detailed analysis. Nevertheless, this is a general disadvantage of survey-based research. With respect to the dependent variable, one could wonder whether other measures like the internal audit budget (Carcello et al., 2005a; 2005b) would lead to the same conclusions. In order to measure management share ownership, a self-reported measure was used. One could wonder the extent to which this measure is sufficiently reliable.

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Exhibit 1:
Relationship between agency variables and the size of the internal audit function

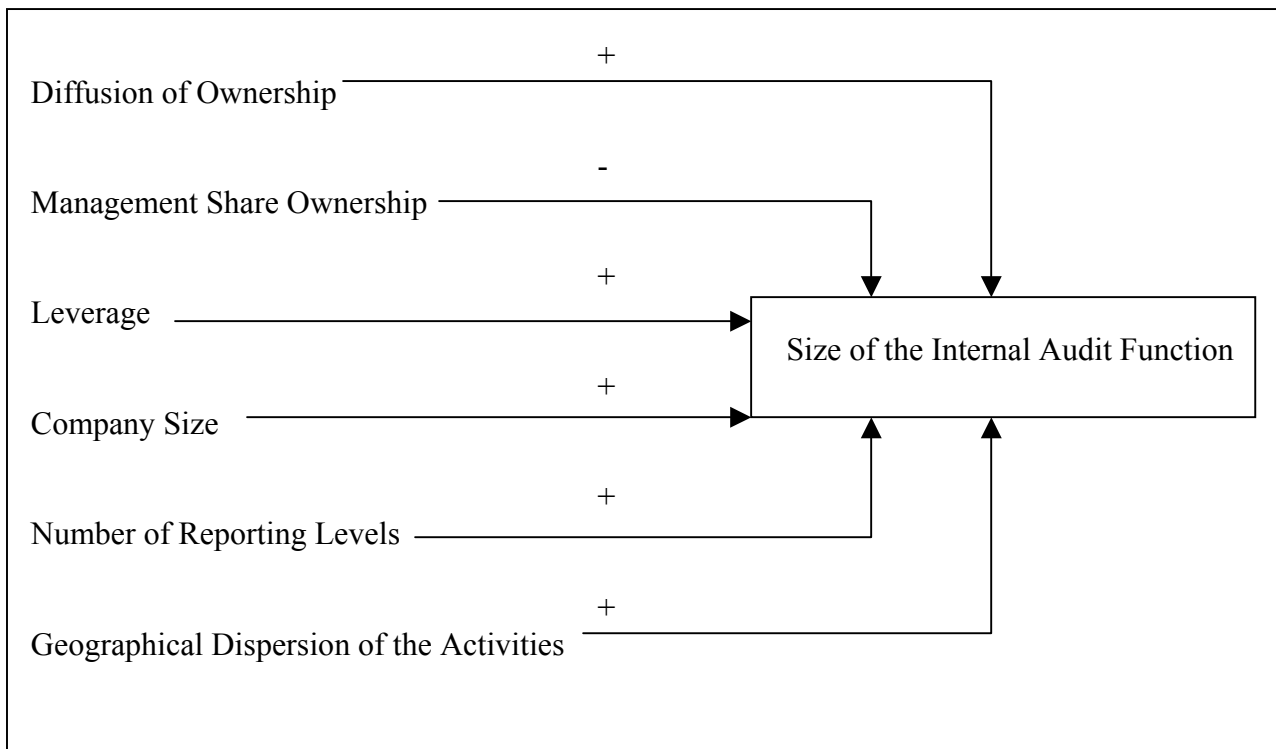


Table 1 : Breakdown of the Respondents

	Frequency	Percentage
<i>Panel A : Industry</i>		
Production, energy, utilities	23	31,50%
Telecom, IT, media, entertainment	9	12,33%
Trade, Transport, logistics	9	12,33%
Professional services	13	17,81%
Financial services and insurances	19	26,03%
	73	100%
<i>Panel B : NYSE listing</i>		
Company or parent company listed on the NYSE	16	21,92%

Table 2: Descriptive Statistics for Dependent and Independent Variables (n = 73)

	Min.	Max.	Mean	S.D.
Number of internal auditors	1	130	10,71	21,19
Ln (Number of internal auditors)	0	5	1,42	1,26
Diffusion of ownership (largest individual percentage of stock ownership)	5,16	100	63,32	29,16
Management share ownership	0	62,65	4,55	10,67
Leverage (total debt / total assets)	10,02	96,99	67,51	21,89
Total assets (in 000 Euro)	9 659	508 761 000	107 000 000	71 834 776,38
Ln (Total assets)	9	20	14,19	2,07
Number of reporting levels between top management and lowest operating unit	1	10	4,38	1,93
Number of countries in which the company has one or more subsidiaries or operating units	1	100	14,51	18,40

Table 3: Correlation Matrix

	Finance	NYSE	Dif_Owner	Mgt_Stocks	Leverage	Ln (Total Assets)	Report_Level	Countries
Finance	1							
NYSE	-.088	1						
Dif_Owner	.115	.029	1					
Mgt_Stocks	.147	-.098	-.173	1				
Leverage	.422**	-.145	-.090	.047	1			
Ln (Total Assets)	.297*	.285*	-.094	-.184	.238*	1		
Report_Level	-.282*	.257*	-.063	-.072	-.140	.156	1	
Countries	-.321**	.221	-.236*	-.047	-.130	.204	.173	1

* : p < .05 ** : p < .01

Table 4: OLS Regression Analysis (n = 73)

Dependent variable: ln (Number_IA)

	Expected Sign	Control Variables		Agency Model	
		Coefficient	T-value	Coefficient	T-value
Finance	+	.061	.564	.004	.049
NYSE	+	.428	3.940***	.148	2.078**
Dif_Owner	-			-.196	-2.823***
Mgt_Stocks	-			-.106	-1.531
Leverage	+			-.119	-1.612
Ln (Total Assets)	+			.660	8.214***
Report_Level	+			.198	2.792***
Countries	+			.062	.838
R ²		.182		.733	
Adjusted R ²		.159		.700	
F-value		7.788***		22.011***	

* : significant at p = .10

** : significant at p < .05

*** : significant at p < .01

Table 5: Univariate Significance Test (ANOVA)

	Financial Companies (n = 19)	Non- Financial Companies (n = 54)	Significance Test		NYSE- Listed Companies (n = 16)	Non NYSE- Listed Companies (n = 57)	Significance Test	
			F	p-value			F	p-value
Number of Internal Auditors	16.19	8.78	1.737	.192	25.04	6.68	10.628	.002
Diffusion of Ownership	68.93	61.35	.950	.333	64.93	62.87	.062	.804
Management Stocks	7.17	3.63	1.566	.215	2.60	5.10	.683	.411
Leverage	82.98	62.07	15.366	.000	61.55	69.19	1.533	.220
Company Size	15.22	13.83	6.888	.011	15.30	13.88	6.273	.015
Number of Reporting Levels	3.47	4.70	6.137	.016	5.31	4.12	5.030	.028
Number of Countries	4.63	17.98	8.131	.006	22.13	12.37	3.642	.060