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Differences in Industry Specialist Knowledge and Business Risk Identification and Evaluation

ABSTRACT: This paper argues that opportunities for auditors to gain industry specific knowledge differ across industry settings. This knowledge is of particular benefit when identifying business risks, information sources, evidence gathering processes and accounts and related assertions. Two groups of auditors, who specialize in very different industries, are compared. One group specializes in a complex industry, which affords them the opportunity to gain relatively more industry specific knowledge than the other group, which specializes in a less complex (generic) industry. Comparing auditor responses with the answers given by expert panels, we find that auditors working in a complex industry have a greater comparative ability to identify business risks, information sources and evidence gathering processes in their industry than auditors working in a generic industry.

Keywords: behavioral decision theory, industry specialization, business risks.

Data Availability: Please contact the corresponding author.

INTRODUCTION

During the planning phase of a financial statement audit an auditor is required to gain an understanding of the client as well as the client's industry. The auditor must identify business risks (ISA 315) and determine an appropriate response to each risk (ISA 330). This response involves the identification of appropriate information sources and procedures to fully comprehend the implications of each identified risk. It also means knowing which accounts and assertions are at risk of material misstatement as a consequence of each identified risk. When undertaking each of these steps, auditors benefit from using industry specialist knowledge (Hammersley 2006). A superior ability at any stage of the audit process will lead to improved audit efficiency and reduced audit risk, which in turn will improve audit quality. We believe that industry specialization creates this superior ability.

The auditing literature has reported that industry specialists perform better when working in specialization than when working out of specialization. Yet not all industries are the same. While all specialists gain performance enhancing industry specific knowledge (Bonner and Lewis 1990; Libby 1995), auditors who specialize in complex industries have the opportunity to gain relatively more sub-specialty knowledge than auditors who specialize in less complex (generic) industries (Dunn and Mayhew 2004).

This paper uses an experimental design in which auditors, who specialize in a complex (superannuation) or generic (manufacturing) industry, completed tasks for both industries. Superannuation (or pension fund) industry specialist auditors gain detailed knowledge about the rules, legislation, financial products and processes that

are associated with this industry. The manufacturing industry is more generic although auditors develop industry-specific knowledge about topics such as accounting for inventories and research and development. The level of detailed industry specific knowledge required to audit clients in the superannuation industry results in such auditors being relatively more specialized.

Partners from the Big 4 accounting firms chose the two industries used in this study and provided access to their staff. Expert panels of industry specialist partners from each industry setting aided in the design of the experimental task and agreed on the list of business risks. Each panel then identified a specific business risk and listed the information sources, evidence-gathering processes and accounts/assertions of most interest, which became the "best responses," used to assess participant responses.

Consistent with the industry specialization literature, both groups of specialists perform better when working in specialization than when working out of specialization at each stage of the planning process (e.g. Solomon et al. 1999; Francis 2004). In line with expectations the complex (superannuation) industry specialist auditors not only perform better when working in specialization than when working out of specialization, they also outperform generic (manufacturing) industry specialist auditors both working in and out of specialization in three of the four stages of the planning process.

The remainder of this paper is set out as follows. The next section contains background literature and hypotheses. This is followed by an overview of the research design, a description of the experiment and a presentation of the results. Finally, in the

last section we discuss conclusions and limitations of the study and the implications for further research.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

The Big 4 accounting firms have structured their audit divisions along industry lines with the majority of their audit staff designated as industry specialists (e.g. Solomon et al. 1999; Francis 2004). Industry specialization can be used to distinguish between the largest firms (Francis et al. 1999; Hogan and Jeter 1999; Francis 2004), helping them to improve efficiency, create barriers to entry and improve audit quality (De Beelde 1997; Gramling and Stone 2001). Some of the ways that audit firms achieve improved audit quality via industry specialization include investing in industry specific staff training, databases and subscribing to industry literature. Individual industry specialists build up a store of industry specific knowledge that aids them in auditing their clients. They work within audit teams, sharing their combined knowledge to provide clients with a superior quality audit on behalf of their audit firm (Solomon et al. 1999).

According to behavioral decision theory, performance is determined by an individual's experience, ability and knowledge (Libby and Luft 1993; Libby 1995). Expertise, which combines knowledge and experience (Bonner and Lewis 1990), has been defined as the ability, acquired by practice, to perform qualitatively well in a particular domain (Bédard and Chi 1993). Expertise is more than gaining general experience, it is the knowledge directly acquired within a particular context (such as an industry setting) through relevant experiences and indirectly through education and training (Bédard 1989).

Prior literature has found that industry specialist auditors have more accurate non-error frequency knowledge (Solomon et al. 1999) and are more effective when assessing inherent risk levels for accounts specific to the industry in which they specialize (Taylor 2000). They are better at detecting errors for clients in their industry (Owhoso et al. 2002) and develop task knowledge differently depending on their area of specialization (Thibodeau 2003). Specialists are also able to assess audit risk more accurately (Low 2004) and better evaluate cue patterns to identify financial statement misstatements (Hammersley 2006). Industry specialists are thus more knowledgeable about their industry and this allows them to perform better when working with industry clients (in specialization) than when working with audit clients outside their industry (out of specialization).

During the planning phase of an audit, auditors make judgments and decisions using incomplete information. At this stage, auditors benefit from their industry specialist knowledge which helps them develop more complete problem representations (Hammersley 2006). This knowledge allows specialist auditors to develop a richer understanding of the risks faced by their clients (Taylor 2000; Low 2004). For each identified risk, they have an awareness of which information sources to search for, which evidence gathering processes to use and which accounts/assertions to test.

Bonner and Lewis (1990) differentiate between different types of knowledge required by auditors. General domain knowledge is common to most auditors and important for all audits. Sub-specialty knowledge is gained by people who work within a particular sub-specialty area, such as an industry setting (Bonner 1990; Bonner and Lewis 1990;

Bedard and Biggs 1991a; Bédard and Chi 1993; Libby and Tan 1994; Wright and Wright 1997). Industry specialists gain industry specific sub-specialty knowledge which allows them to perform better than non-specialists on tasks within their industry. This does not mean that industry specialists are better auditors or have superior general domain knowledge; their experience in auditing clients predominantly within one industry allows them to perform better on tasks within that industry (Solomon et al. 1999).

The industry specialization research has inferred that the benefits of specialization accrue equally across all industries. But industries are not homogenous; an important distinction between industries is their level of complexity (Dunn and Mayhew 2004; Abdolmohammadi et al. 2004; Godfrey and Hamilton 2005). Variance in complexity across industries is an important attribute of an auditor's learning environment (Libby 1995), which influences the level of industry specific knowledge required to audit clients in different industries.

Industries such as banking, insurance, finance and superannuation require compliance with detailed legislative and reporting requirements. Auditors who specialize in these complex industries have an opportunity to gain detailed industry specific knowledge. In contrast, generic industries such as retail, service and manufacturing require less industry specific knowledge (Dunn and Mayhew 2004; Abdolmohammadi et al. 2004). As a consequence of their detailed industry specific knowledge, complex industry specialist auditors working in specialization are expected to enjoy relative performance gains when compared with generic industry specialist auditors.

This observation does not contradict the extant industry specialization literature, which has found that all auditors perform better when working in specialization than when working out of specialization. It is the *relative* performance gain that can be enjoyed by complex industry specialist auditors that is of interest here. The complexity of the industry they specialize in makes it difficult for non-specialists to perform well on tasks set in that industry. As such, we expect superior performance by complex industry specialists when working in specialization compared to when working out of specialization and when compared to generic industry specialists.

Our expectation is demonstrated in a table and graphically in Figure 1. Participants in cell 1 (complex industry specialists working in specialization) are expected to perform better than participants in cells 2, 3 and 4. For each hypothesis outlined below, superior performance is defined as listing a greater number of items in common with the "best responses" identified by expert panels of industry specialist audit partners.

[Insert Figure 1 here]

Business Risk Identification

Business risk identification is crucial to each audit (ISA 315). Industry specialists have the industry specific knowledge necessary to identify the risks that misstatements may occur. Taylor (2000) found a significant difference in the inherent risk assessment of banking and non-banking specialist auditors for all but one assertion for an industry specific account (loans receivable) but not for a non-industry specific account (property and equipment). Low (2004) found that banking specialist auditors were better able to discriminate between high and low audit risk than non-specialist auditors.

Risk identification is a prelude to information search (e.g., Koonce 1993; ISA 315) and has been tested as a measure of performance in its own right (e.g. Libby and Frederick 1990; Ismail and Trotman 1995; Solomon et al. 1999). To successfully identify a client's business risks requires comprehensive knowledge of the client's industry and its position in that industry (De Beelde 1997). As such, industry specialist knowledge is expected to help in the vital business risk identification stage of the audit (Abdolmohammadi et al. 2004; Bell et al. 2005).

It is expected that in complex industries, specialists will have a more developed unique sub-specialty knowledge which will allow for superior performance on tasks undertaken within that industry when compared to other auditors, whereas in generic industries there is not as much to be gained from specialization. For the task of identifying business risks, this will be tested by the following hypothesis:

> **H1:** Specialist auditors from a complex industry will list a greater proportion of appropriate business risks when working in specialization than when working out of specialization and when compared to specialist auditors from a generic industry, either working within or outside specialization.

Identification of Information Sources, Processes, Accounts and Assertions

When responding to a specific business risk, an auditor has to search for relevant and reliable audit evidence and list the accounts and assertions to test in response to that risk. Cognitive research has found that experts (specialists) have more complete knowledge and memory organization than novices (Bédard 1989; Hassebrock et al. 1993; Brailey et al. 2001). Industry specialists have a more complete problem representation, which they bring to an unstructured industry task (Hammersley 2006).

When faced with a problem, information can be selected internally, from memory, or externally to help solve the question at hand (Solomon et al. 1999; Brailey et al. 2001; Hammersley 2006). For a business risk specific to that industry, specialists in that industry know which information sources to search for, how to access the information needed and how the pieces of information fit together. Thus, specialists should have a complete representation of the problem at hand (Hammersley 2006). For the reasons outlined for business risk identification above, it is expected that in complex industries, specialists will outperform other auditors on tasks undertaken within that industry, whereas for generic industries there is not as much to be gained from specialization.

H2a: Specialist auditors from a complex industry will list more appropriate information sources when working in specialization than when working out of specialization and when compared to specialist auditors from a generic industry, either working within or outside specialization.

H2b: Specialist auditors from a complex industry will list more appropriate evidence-gathering processes when working in specialization than when working out of specialization and when compared to specialist auditors from a generic industry, either working within or outside specialization.

H2c: Specialist auditors from a complex industry will list more appropriate accounts and related assertions when working in specialization than when working out of specialization and when compared to specialist auditors from a generic industry, either working within or outside specialization.

RESEARCH DESIGN

A 2x2 design is used, with industry specialists from a complex (superannuation) and a generic (manufacturing) industry completing two tasks, one in each industry. The order of the tasks was randomly varied between participants.[1]

[1] A test for order effects was not significant for either the complex (*t=1.089, p 0.20*) or generic (*t=1.450, p > 0.10*) task.

Participants

Partners from each of the Big 4 accounting firms provided 97 industry specialist auditors from the superannuation and manufacturing industries.[2] To be consistent with prior studies (e.g., Solomon et al. 1999) and the theory outlined above regarding expertise, participants with less than two years industry-based audit experience were excluded from the current study. Of the 97 auditors, four auditors from the complex industry and seven from the generic industry were excluded on this basis. Two from the generic industry did not complete the experiment so their data were also excluded. As a result, 84 auditors (38 complex industry specialists and 46 generic industry specialists) participated in this experiment.[3] There was no significant difference in the experience levels of the auditors from the two industry groups (*t=0.733, p=.466*).[4]

TASK DEVELOPMENT

Two expert panels of Big 4 industry specialist partners (one from each industry) aided in the design of the experimental tasks. The first stage involved the listing of the most important business risks for clients in each industry. The second stage involved the listing of information sources, evidence gathering processes, accounts and assertions to test for a specific business risk identified by the expert panels. The specific risks are the risk associated with solvency due to insufficient funding in defined benefit plans (for the complex industry) [5] and the risk of technological change (for the generic

[2] A Kruskal-Wallis test was run to compare performance across the participating accounting firms. The result is not significant ($\chi^2(df=3)=3.136$, $p > 0.30$).
[3] All hypotheses presented in this paper were re-tested with those participants with less than two years industry experience and the inferences were unaffected.
[4] The complex industry specialists had an average of 5.2 years (ranging from 2 to 27) industry-based audit experience and the generic industry specialists had an average of 4.6 years (ranging from 2 to 16) industry-based audit experience.
[5] The final payout on retirement is usually a multiple of final salary, rather than contributions.

industry). These business risks were kept to a minimum of detail (one sentence each) to ensure that there was adequate but not too much detail provided.[6]

The expert panels confirmed that the knowledge required to complete each task successfully is industry specific and is the kind of knowledge required of their industry specialist audit staff. The expert panels included industry specialist partners from three of the Big 4 accounting firms. Partners from the fourth Big 4 accounting firm approved the experiment and the "best response" lists before the experiment was conducted. An internet based program, which was pilot tested, was developed by a specialist computer programmer for this experiment.

The expert panels were initially asked to list between five and ten business risks common to clients in the industry in which they specialize. A compilation was made, which resulted in 16 risks for the complex (superannuation) industry and 12 risks for the generic (manufacturing) industry. From each list, the expert panels agreed on the final list of the five most important risks for clients in their area of specialization.

The list of the five most important risks for each industry is shown in Table 1. The order of the risks listed in this table reflects the order of importance placed on them by the expert panels. All five risks were considered to be very important by every member of each expert panel. The number and percentage of participants from each industry group that listed each risk are included in Table 1.[7]

[6] The expert panels agreed that there was sufficient detail in the risk descriptions to evoke the mental models (Hammersley 2006) that industry specialists bring to the tasks, and to provide adequate description of the risk for those working outside their specialization.

[Insert Table 1 Here]

For the second stage of the experiment, participants were asked to list the information that they would need to access to determine the significance of each identified risk, outline the steps they would take to find that information and list the account(s) and related assertion(s) they would expect to test for each risk. The use of an internet based program to capture participant responses meant that it was not possible for participants to go back and revise their list of business risks once they had moved on to the second stage of the task. Panels A and B of Table 2 include the complete lists, in no particular order, identified by the expert panels for each industry setting. The number and percentage of each group of specialists that listed each item is also provided.[8]

[Insert Table 2 Here]

THE EXPERIMENT

The experiment was administered in the offices of each of the Big 4 accounting firms. A researcher was present at every sitting. Each participant was asked to sign a form acknowledging their agreement to take part in the experiment and then logged on to the internet based software using a unique username and password provided by the researcher. First, participants completed two industry-based cases[9] and then

[7] There was no significant difference in the experience levels for participants listing any one of the risks ($p > 0.05$). Thus, experience alone did not determine which risks were listed by the participants.
[8] Correlations between the dependent variables are significant but they are not at a level which suggests that they are measuring the same construct: all correlations are less than 0.70, which is below the critical value of 0.80, (Wulder 2005).
[9] The results for this part of the experiment are reported in Moroney (2007). A post-study check was undertaken to ensure that completing the cases did not impact auditor performance on the listing tasks reported in this paper. A group of 14 postgraduate students completed the listing tasks after half read through the cases. The other half read unrelated materials. Performance was not affected by reading the cases.

completed the tasks for this study. Finally, participants answered some questions about their work experience.

Data were captured electronically. Two researchers independently analyzed the written participant responses without knowing whether a participant was responding to a task in their industry of specialization. Each listed response was compared to the "best response" list compiled by the expert panels.[10] Once the coding was completed the coders met to discuss and resolve discrepancies in their coding.

RESULTS

Results for Risk Identification

Hypothesis 1 predicted that specialist auditors from the complex industry working in specialization will list a greater proportion of business risks than when working out of specialization and when compared to generic industry specialist auditors, either working within or outside specialization. The descriptive data in Panel A of Table 3 shows that complex industry specialist auditors working in specialization listed the greatest proportion of risks in common with the expert panels.

Panel B of Table 3 provides a preliminary test of the first hypothesis comparing the mean proportion of risks listed by the complex industry specialist auditors when working in specialization (0.62) with the mean proportion of risks listed by the others (0.48) ($t=4.134$, $p < 0.001$). The results for the analysis of variance (ANOVA) are presented in Panel C of Table 3. The comparison of the complex industry specialist

[10] Cohen's Kappa (1960) for risks, information sources, processes and accounts/assertions was 0.93, 0.95, 0.95 and 0.97, respectively (all significant at $p < 0.001$) for the complex industry and 0.89, 0.97, 0.97 and 0.99, respectively (all significant at $p < 0.001$) for the generic industry.

auditors working in specialization with the others is statistically significant (*F=17.091, p < 0.001*).[11] This result supports hypothesis 1.[12]

[Insert Table 3 Here]

The descriptive data in Panel A of Table 3 also show that both groups of auditors listed a greater proportion of risks when working in specialization than when working out of specialization (*p < 0.01,* one tail, not tabulated), which is consistent with the industry specialization literature.[13] When working in specialization the complex industry specialist auditors also listed a significantly greater proportion of risks (0.62) than the generic industry specialist auditors (0.54) (*t=1.99, p < 0.03,* one tail, not tabulated). This finding further strengthens the results in support of hypothesis 1.

Results for Information Sources, Processes, Accounts and Assertions

Hypothesis 2 predicted that complex industry specialist auditors will be more effective in identifying information sources (H2a), evidence gathering processes (H2b), and accounts and assertions (H2c) in common with an expert panel (see Table 2) when working in specialization than when working out of specialization and when compared to generic industry specialist auditors.

[11] The participants were also asked to rank the risks listed. Their ranking was compared to the expert panel ranking of the risks presented in Table 1. The results are consistent with those for risk identification (*p < 0.005*, not tabulated).

[12] When years of audit experience is added as a covariate in an ANCOVA, including industry specialization and working within and outside specialization as factors, years of audit experience is not significant and the inference for risk identification remains unchanged.

[13] A 2x2 ANCOVA was run with industry (complex versus generic), specialization (working in versus working out) and years of audit experience as a covariate. The interaction between industry and specialization was significant (*F=22.561, p < 0.001*), while the covariate was insignificant (*p > 0.64*).

The descriptive data in Panel A of Table 4 shows that the complex industry specialist auditors working in specialization listed the most information sources and processes in common with the expert panels. They did not, however, list the most accounts and assertions. Panel B provides a preliminary test of the second hypothesis comparing the mean number of information sources, processes, and accounts and assertions listed by the complex industry specialist auditors when working in specialization with those identified by the others. The complex industry specialists working in specialization listed significantly more information sources ($t=6.243$, $p < 0.001$) and processes ($t=5.268$, $p < 0.001$), though the result for accounts and assertions is not significant ($t=1.385$, $p > 0.05$, one tail).

The results for the ANOVA for the second hypothesis are presented in Panel C of Table 4. The comparison of the complex industry specialist auditors working in specialization with the others is statistically significant for listing of information sources ($F=38.979$, $p < 0.001$), which provides support for hypothesis 2a. Results are also statistically significant for the listing of evidence gathering processes ($F=27.755$, $p < 0.001$), which provides support for hypothesis 2b. However, results are not statistically significant for the listing of accounts and assertions ($F=1.919$, $p > 0.16$), failing to support hypothesis 2c.[14]

[Insert Table 4 Here]

The descriptive data in Panel A of Table 4 also show that both groups of auditors listed significantly more information sources ($p < 0.001$, one tail, not tabulated),

processes ($p < 0.001$, one tail, not tabulated), accounts and assertions ($p < 0 .04$, one tail, not tabulated) when working in specialization than when working out of specialization, which is consistent with the industry specialization literature.[15] The complex industry specialist auditors also listed significantly more information sources (3.05 compared to 2.45, $t=2.52$, $p < 0 .01$, one tail, not tabulated) and processes (2.63 compared to 2.13, $t=1.92$, $p < 0.03$, one tail, not tabulated) than the generic industry specialist auditors when both groups were working in specialization, further strengthening the results for hypotheses 2a and 2b.

CONCLUSIONS

The purpose of this study was to assess whether area of industry specialization impacts an auditor's performance during the planning phase of the audit. While the literature has established that industry specialists outperform non-specialists on tasks set within their area of expertise, there has been little attempt to differentiate between industries and the different opportunities to gain industry specific knowledge in complex versus generic industries.

The focus of this study was the *relative* performance gains available to auditors who specialize in a complex industry when compared to auditors who specialize in a generic industry. Auditors who specialize in a complex industry were found to list the greatest proportion of business risks in common with expert panel prepared lists of risks. They were also found to perform relatively better during other stages of the

[14] When years of audit experience is added as a covariate in an ANCOVA including industry specialization and working within and outside specialization as factors years of audit experience is never significant and the inferences for each variable described remain unchanged.

[15] A 2x2 ANCOVA was run with industry (complex versus generic) and specialization (working in versus working out) and years of audit experience as a covariate. The interaction between industry and specialization was significant for information sources ($F=69.956$, $p < 0.001$), for processes ($F=45.892$,

planning process, as reflected in their listing more information sources and evidence-gathering processes (but not more accounts/assertions) identified by an expert panel for a nominated business risk.

The results presented in this paper extend our understanding of the benefits of specialization. By comparing the relative performance of auditors, the benefits of specialization within different industry settings emerge. This finding is attributed to the more detailed industry specific knowledge required to audit clients in complex industries. This finding does not undermine the benefits of specialization in generic industries but rather serves to highlight the diverging opportunities to gain industry specific knowledge across different industry settings.

A limitation of this study is the fact that the findings are restricted to the industries and risks tested. To improve the generalizability of this study, this work could be conducted in different industry settings. With regards the specific business risks explored, a possible threat is that there are a different number of unique risks and information sources which are valid responses for each risk. This threat is alleviated by the fact that the number of responses considered valid by the expert panel did not significantly differ between the two industry settings. For example, the population of business risks compiled by the expert panels resulted in 16 risks for the complex industry and 12 risks for the generic industry. The data presented in Table 2 further indicates that the expert panels listed three more possible information sources for the generic industry than for the complex industry.

$p < 0.001$), and for accounts/assertions ($F=7.557$, $p < 0.008$). The covariate is never significant ($p > 0.33$).

The findings reported in this paper suggest that researchers should take care when grouping industry specialists and their firms. Not all industries are the same and the benefits accruing to specialists by way of industry specific knowledge also differ. While both groups of industry specialists benefit from their specialization, a *relative* advantage is enjoyed by those that specialize in a complex industry.

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FIGURE 1
Structure of the Experiment

	Complex Industry Specialists	Generic Industry Specialists
In Specialization	Cell 1	Cell 3
Out of Specialization	Cell 2	Cell 4

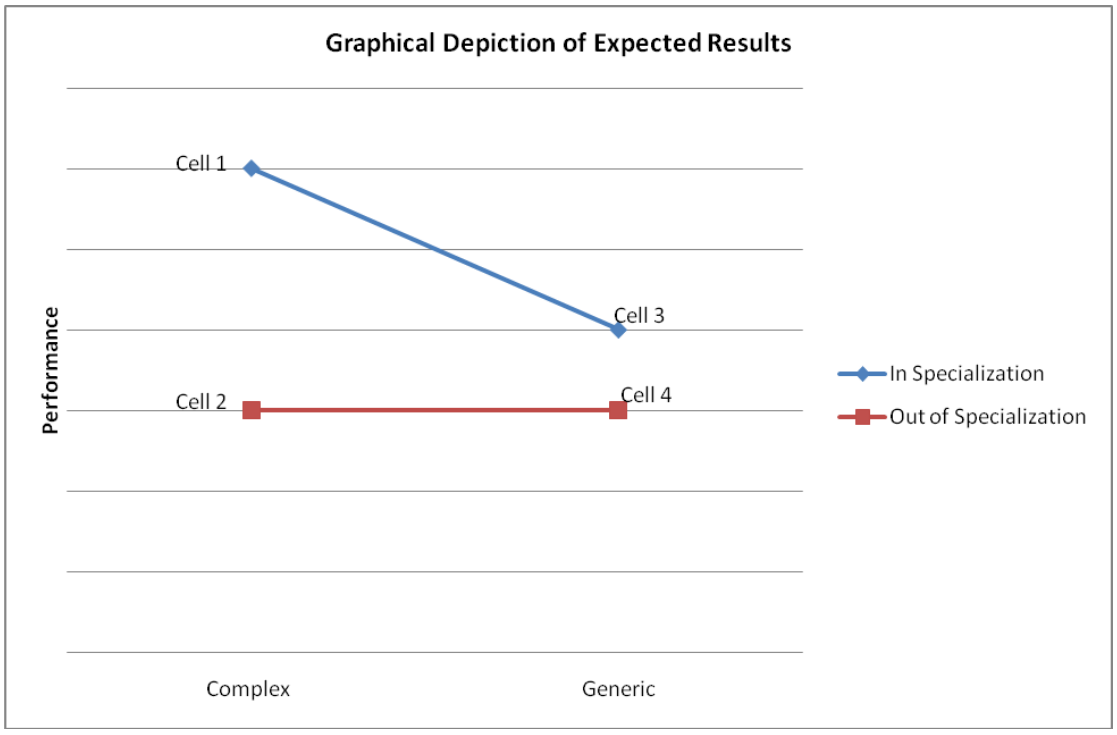

TABLE 1
Items Listed

Business Risks Listed; Number (Percentage)

Risks Identified by the Expert Panel for the Complex (Superannuation) Industry	Listed by Complex Industry Specialists (n=38)	Listed by Generic Industry Specialists (n=46)
Investment management/ performance (including Funding Position)	31 (82%)	45 (98%)
Coping with changes in legislation	13 (34%)	12 (26%)
Compliance with legislative requirements	30 (79%)	22 (48%)
Administrative issues	27 (71%)	13 (28%)
Fraud	13 (34%)	2 (4%)
Risks Identified by the Expert Panel for the Generic (Manufacturing) Industry		
Product obsolescence/ competitive forces	29 (76%)	40 (87%)
Loss of market share/ going concern	6 (16%)	15 (33%)
Technological change	14 (37%)	20 (43%)
Economic factors – interest rates, external financing, demand, exchange rates	16 (42%)	25 (54%)
Level of demand – customers/ risk of losing business	11 (29%)	18 (39%)

TABLE 2
Items Listed

Panel A: Information Sources, Evidence Gathering Processes and Accounts/Assertions for the Complex (Superannuation) Industry; Number (Percentage)

Information Sources Identified by the Expert Panel:	Listed by Complex Industry Specialists (n=38)	Listed by Generic Industry Specialists (n=46)
Balance sheet - net assets	20 (53%)	17 (37%)
Vested Benefits	22 (58%)	3 (7%)
Actuarial report	35 (92%)	16 (35%)
Contributions outstanding (>30 days)	2 (5%)	2 (4%)
Deficiency levels of employers/solvency	23 (61%)	17 (37%)
Investment reports	9 (24%)	11 (24%)
Minutes	5 (13%)	1 (2%)
Evidence Gathering Processes Identified by the Expert Panel:		
Determine if funding deficiency	17 (45%)	9 (20%)
Check with employer if can meet deficiency	11 (29%)	1 (2%)
Obtain/review/discuss actuarial report	24 (63%)	13 (28%)
Obtain/review valuation of investments	4 (11%)	16 (35%)
Inquiries of client/trustee	23 (61%)	21 (46%)
Obtain/review vested benefits information	3 (8%)	0
Obtain/review financial statements	9 (24%)	6 (13%)
Accounts/Assertions Identified by the Expert Panel:		
Valuation of vested benefits	26 (68%)	3 (6%)
Valuation of receivables	1 (2%)	2 (4%)
Valuation of investments	20 (53%)	25 (54%)
Completeness of Liabilities	7 (18%)	14 (30%)

TABLE 2 (Continued)
Items Listed

Panel B: Information Sources, Evidence Gathering Processes and Accounts/Assertions for the Generic (Manufacturing) Industry; Number (Percentage)

Information Sources Identified by the Expert Panel:	Listed by Complex Industry Specialists (n=38)	Listed by Generic Industry Specialists (n=46)
Contracts in place	1 (3%)	2 (4%)
Level of Demand	3 (8%)	3 (7%)
Slow moving Stock	4 (11%)	5 (11%)
Type of product - susceptibility to tech change	12 (32%)	24 (52%)
Write down policy of assets/fixed asset information	5 (13%)	14 (30%)
Profits/Sales decline	2 (5%)	13 (28%)
Level of capital expenditure in future	4 (11%)	9 (20%)
Minutes	3 (8%)	7 (15%)
Industry publications	6 (16%)	22 (48%)
Level of R&D expenditure	13 (34%)	14 (30%)
Evidence Gathering Processes Identified by the Expert Panel:		
Discussion with sales staff/client re sales/stock	3 (8%)	12 (26%)
Read industry publications/compare client and industry norm	8 (21%)	20 (43%)
Customer demand - shift?	0	2 (4%)
Discussions with client re impact	30 (79%)	33 (72%)
Analytical procedures - need for write down	0	11 (24%)
Review fixed asset register/financial statements	4 (11%)	13 (28%)
Read minutes	4 (11%)	5 (11%)
Accounts/Assertions Identified by the Expert Panel:		
Valuation of research and development	7 (18%)	10 (22%)
Valuation of property, plant and equipment	15 (39%)	30 (65%)
Measurement of depreciation	1 (2%)	0 (0%)
Valuation of inventory	15 (39%)	28 (61%)

TABLE 3
Results for Hypothesis 1 - Business Risks[♦]

Panel A: Mean Proportion (Standard Deviation) of all specialists

	Complex Industry Specialists (n=38)	Generic Industry Specialists (n=46)
In Specialization	0.62	0.54
	(0.18)	(0.18)
Out of Specialization	0.50	0.40
	(0.20)	(0.15)

Panel B: Mean Proportion (Standard Deviation) of complex industry specialist auditors working in specialization compared to the others

Complex Industry Specialists Working in Specialization (n=38)	**Others[*] (n=130)**	**t**	**p**
0.62	0.48	4.134	.000
(0.18)	(0.18)		

Panel C: ANOVA

Source of variation	**d.f.**	**F**	**Sig.**
Between Subjects: Complex industry specialists working in specialization compared to the others[*]	1	17.091	.000

[♦] Proportion of business risks listed in common with the expert panel's list of risks

[*] The others comprise the complex industry specialists working out of specialization and the generic industry specialists working in and out of specialization.

TABLE 4
Results for Hypothesis 2 - Information Sources, Evidence Gathering Processes, Accounts and Assertions

Panel A: Mean (Standard Deviation) of all specialists

	Information Sources		Evidence Gathering Processes		Accounts and Assertions	
	Complex Industry Specialists (n=38)	Generic Industry Specialists (n=46)	Complex Industry Specialists (n=38)	Generic Industry Specialists (n=46)	Complex Industry Specialists (n=38)	Generic Industry Specialists (n=46)
In Specialization	3.05	2.45	2.63	2.13	1.42	1.48
	(0.84)	(1.24)	(1.28)	(1.10)	(0.79)	(0.75)
Out of Specialization	1.52	1.39	1.34	1.32	1.00	0.96
	(0.89)	(0.93)	(0.71)	(0.79)	(0.90)	(0.76)

Panel B: Mean (Standard Deviation) of complex industry specialist auditors working in specialization compared to the others

	Complex Industry Specialists Working in Specialization (n=38)	**Others[*] (n=130)**	**t**	**p[#]**
Information Sources	3.05	1.81	6.243	.000
	(0.84)	(1.14)		
Evidence Gathering Processes	2.63	1.62	5.268	.000
	(1.28)	(0.97)		
Accounts and Assertions	1.42	1.28	1.385	.084
	(0.79)	(0.82)		

[*] The others comprise the complex industry specialists working out of specialization and the generic industry specialists working in and out of specialization.
[#] One tail

TABLE 4 (Continued)
Results for Hypothesis 2 - Information Sources, Evidence Gathering Processes, Accounts and Assertions

Panel C: ANOVA

	Information Sources			Evidence Gathering Processes			Accounts and Assertions		
Source of variation	**d.f.**	**F**	**Sig.**	**d.f.**	**F**	**Sig.**	**d.f.**	**F**	**Sig.**
Between Subjects: Complex industry specialists working in specialization compared to the others*	1	38.979	.000	1	27.755	.000	1	1.919	.168

* The others comprise the complex industry specialists working out of specialization and the generic industry specialists working in and out of specialization.