Audit Firm’s Characteristics and Assurance Services’ Provision

(An Empirical Study)

By

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Abstract

This study examines the relationship between audit firm’s characteristics (size, technology level, and industry specialization) and assurance services’ provision in Egypt. The ability of audit firm’s to provide and offer the assurance services is related to audit firm’s characteristics (size, technology level, and industry specialization). The current study adopts the quantitative research approach by the logistic regression model, for analyzing the size, technology level, and industry specialization to assurance services’ provision. The study sample is all audit firms which audit the listed traded companies of all sectors in the Egyptian stock exchange for the period from 2013 to 2017, which are 67 audit firms that include audit firms with foreign partners and local audit firms without foreign partners. Results show that the relationship between level of technology and assurance services’ provision is highly significant. There is a positive relationship between technology level and assurance service provision; using and adopting advanced software packages and audit tools lead audit firms to provide assurance services’ other than audit of financial statements. There is no significance interaction between size and industry specialization of audit firm with assurance services’ provision. The three independent variables were different in value and significance with the assurance services provision.

Keywords: audit firm’s characteristics; size; technology level; industry specialization; Sarbanes-Oxley act (SOX); trust services (SysTrust and WebTrust); assurance services’ provision; logistic regression model.
خصائص مكتب المراجعة وتقديم خدمات التأكد
(دراسة إمبريقيا)

ملخص
يهدف هذا البحث إلى دراسة العلاقة بين خصائص مكاتب المحاسبة والمراجعة (الحجم، المستوى التكنولوجي، والتخصص الصناعي) وتقييم خدمات التأكد في مصر، حيث ترتبط القدرة على تقديم هذه الخدمات بتلك الخصائص. تتبع هذه الدراسة المنهج الكمي عن طريق استخدام نموذج الانحدار اللوجستي لتحليل عوامل (الحجم، المستوى التكنولوجي، والتخصص الصناعي) وتقييم خدمات التأكد. تمثل عينة الدراسة في مكاتب المحاسبة والمراجعة لجميع الشركات المقيدة أسرهم بمختلف قطاعات سوق الأوراق المالية المصرية للفترة من عام 2013 حتى عام 2017.
تحتوي عينة الدراسة على 67 مكتب محاسبة ومراجعة من بينهم شركاء لمكاتب أجنبية وآخر محلية. توصلت نتائج الدراسة إلى وجود ارتباط معنوي بين المستوى التكنولوجي لمكاتب المحاسبة والمراجعة وتقييم خدمات التأكد. هناك علاقة طردية بين المستوى التكنولوجي وتقديم خدمات التأكد، حيث يؤدي استخدام مكاتب المحاسبة والمراجعة لحقائب برمجيات وأدوات مراجعة حديثة إلى قدرة هذه المكاتب على تقديم خدمات تأكد بخلاف مراجعة القوائم المالية. من ناحية أخرى، لا توجد علاقة معنوية بين عامل (الحجم والتخصص الصناعي) وتقديم خدمات التأكد. بذلك يختلف تفسير المتغيرات المستقلة الثلاثة في القيمة وعلاقتها المعنوية مع تقديم خدمات التأكد كمتغير تابع.
كلمات مفتاحية: خصائص مكاتب المحاسبة والمراجعة؛ الحجم؛ المستوى التكنولوجي؛ التخصص الصناعي؛ قانون ساربينز أوكسلي (SOX)؛ خدمات الثقة (الثقة في النظم والثقة في الموقع الإلكتروني)؛ تقديم خدمات التأكد؛ نموذج الانحدار اللوجستي.
Audit Firm’s Characteristics and Assurance Services’ Provision
(An Empirical Study)

1. Introduction

The importance of assurance service comes from the rapid development of information technology (IT), changes in the business environment, the increased level of voluntary disclosure, the necessity of retaining current clients and attracting future clients, meeting the increased demand on assurance services for financial reporting users, considering companies management as extension of the traditional audit, and facing the decrease of audit firms revenues (Alsaka, 2007; Knechel, 2007; daigle and Lampe, 2003; Elliott, 1998). The increase of providing assurance services helps obtaining market permission from potential clients, maintaining auditor’s independence, improving auditor’s skills, and compliance with professional standards.

There is more than one definition for the assurance services; the American Institute of Certified Public Accountants (AICPA) defines the assurance service as "an independent professional service aims to improve the quality of the information displayed and presented to the investors for making decisions". Based on this definition, independence is the main requirement of the service provider (AICPA, 2001). The Auditing Standards Board (ASB) is the AICPA’s senior committee for auditing, attestation, and quality control applicable to the performance and issuance of audit and attestation reports for non-issuers. ASB defines attestation services as “assurance services through which auditor issues written report about the reliability of provided assurance
from one party to another”. The attestation engagement is “a commitment by the auditor for issuing written report about review, audit or agreed up on procedures (assurance) toward subject matter which is the responsibility of another party”. Sarbanes-Oxley act (SOX) defines assurance services as “professional services that improve the quality of information for decision makers. Assurance services can be performed by auditors” (SEC, 2002). The Canadian institute of Chartered accountants (CICA) has issued Auditing and assurance standards in Canada of auditing and assurance standards board (AASB) which defines assurance engagement as “engagement between two parties or more through which auditor provides written report about the level of assurance for subject of review” (IAASB, 2018). SOX established Public Company Accounting Oversight Board (PCAOB). PCAOB reports to the Securities and Exchange Commission (SEC) and it has a supervisory role. PCAOB oversees public companies’ compliance with SOX requirements to improve the accounting and auditing performance.

The Ministry of Investment of Egypt along with accountability state authority, the Egyptian accountants and auditors association, and the Egyptian Financial Supervisory Authority have issued the Egyptian standards for auditing, limited review, other assurance services which define assurance engagement as “the engagement through which auditor aims to increase the credibility for financial reporting users” (Ministry of Investment, 2008).

2. Assurance Services’ provision

The development of assurance services provision represents challenge facing audit firms and it is seen by some members of the accounting
profession as a remedy for the declining growth in traditional audit services. The profession’s reputation as the provider of high quality financial audit services has not readily extended to other assurance services. The profession has been losing market share in these services to groups outside the profession. The profession must be actively involved in the development of these services and standards to preserve and enhance its reputation and relevance. The assurance service provision is constrained by the demand and supply sides. The investors are considered the demand side of assurance services who demand the types and level of assurance services to gain their confidence in the financial reporting to make their investment decisions. The audit firms and the auditors are considered the supply side responsible for providing the different types of assurance services for their clients. Both of the two sides are constrained by some determinants.

The provision of assurance services can be examined through audit firm characteristics and auditors’ characteristics. For example, Brackney and Helms (1996) examine the nature and extent of assurance services being provided by AICPA professionals. Collison and Gray (1997) investigate UK audit practitioners’ awareness and familiarity with the verification of environmental reports; while Boritz and Cockburn (1998) summarize the attitudes of (then) Big 6 audit partners as presented at the 1998 Audit Symposium Panel Discussion on Assurance Services. Other researchers examined the nature of assurance services that provided by the audit firms in specific countries such as Singapore (C. P. and Mock, 1999) and the Netherlands (Dassen and Schelleman, 2001). Fargher and Gramling (2003)
find a difference in perceptions between attestations provided by Big Six audit firms and attestations provided by financial services firms.

In Egypt, Dawood (2010) used the analytical approach to analyze the assurance services and their types from the external auditor’ point of view in the Egyptian business environment by determining the importance of some assurance services which are assessment of internal control structure, systrust and webtrust services, and the internal audit effectiveness for retaining investors’ confidence. Abd-almolla (2007) discussed the auditor responsibility of assurance services according to the international auditing standards. Furthermore, the ministry of investment issued “the Egyptian framework for assurance services”, which would highlight the types of assurance services and their determinants in the Egyptian business environment and the required characteristics of the auditors to provide it. The current study is concerned with the supply of assurance services and its determinants in Egypt.

3. Audit firm’s Characteristics

3.1 Size

The audit firm size might be measured in terms of reputation, revenue, number of clients, or market share. The Big Four audit firms are PricewaterhouseCoopers (PwC), Deloitte & Touche, KPMG, and Ernst & Young (EY). They provide many services such as assurance services (audit and review as attestation services), and nonassurance services such as taxation, accounting & bookkeeping, management consulting, actuarial, corporate finance and legal services for either public and private companies.
The current study examines the determinants of assurance services’ provision for audit firms with foreign partners (including the big four audit firms) and audit firms without foreign partners in Egypt.

3.2 Technology Level

Currently, most of audit firms use IT for coping with the current environment and its change for enhancing the provision of assurance services demanded by the clients. First, some studies inspect the degree to which auditors use IT in their audits. Second, researchers examine the effect of audit firm size on the information technology level. Third, researchers examine the difference in information technology between the big four auditors and non-big four auditors (Lowe et al., 2018). Audit firms improved their use of information technology application in the last ten years and they are ready to improve those applications and software for audit performance’s interest. Also, audit firms need to train their auditors on how to use the new information systems and to improve their skills and expertise in attracting new customers (Goldwasser, 2005; Dassen and Schelleman, 2001).

3.3 The Industry specialization

There are a large number of indicators to measure the industry specialization for audit firms such as the market share in the industry, the audit fees, sales revenues, and the total assets (Garcia-Blandon and Argiles-Bosch, 2017). Industry market share (IMS) is defined as the proportion of the audit fees earned by the auditor in an industry to the total audit fees earned by all auditors serving the same industry. For example, Balsam et al. (2003) used the market share measure at the national
level. Krishnan (2003) use net sales of clients as basis to estimate the proportions of audit fees received from clients in various industries. While Liu et al. (2017) have measured auditors' IMS as the proportion of the net sales of the auditor's clients in an industry, to the total net sales of all auditors' clients in the same industry, or the number of clients to calculate IMS, as an alternative measure in Taiwan. In addition, it can be measured through auditors market share that above a threshold (Casterella et al., 2004) or auditors with client size or large number of clients in the market (Chin and Chi, 2009).

Thus, the main research problem of this study lies in the gap in literature concerning whether audit firms provide adequate assurance services that truly reflect financial reporting’s users demand. Audit firms’ ability to provide such services is controlled by some characteristics. The researcher is motivated to investigate how audit firm’s characteristics (size, technology level, and industry specialization) can affect assurance services provision in Egypt. Accordingly this study attempts to answer the following questions:

“Do audit firm’s characteristics (size, technology level, and industry specialization affect the assurance services’ provision in Egypt?”

4. Literature review and hypotheses development

Some studies investigate the relationship between the audit firm’s characteristics which are size, technology level, and industry specialization and the probability of providing assessment of internal control structure and Trust services. They found that some characteristics of audit firms which are the size, the market share, the level of technology, the industry specialization
and the cost of these services are associated with the provision of assessment of internal control structure and Trust services (Brown-Liburd and Zamora, 2015; Copley and Douthgett, 2009; Goldwasser, 2005). Dawood (2010) concludes that technology level is the main audit firm characteristics which affect the level of assurance service provision then size and industry specialization.

Hasan et al. (2005) conduct a survey for determining the types of assurance services on 56 audit firms in 11 countries. The level of assurance that is provided by the former big 5 audit firms differs from non-big 5 audit firms. Some researchers found that the size of audit firm does not necessarily affect positively its provision of different types of assurance services; there are non-big 4 audit firms that lead the market related to certain assurance services (Lowe et al., 2018). Knechel et al. (2006) conclude that the size is the most important characteristic of audit firms and that costliness was not important. Simnett, et, al. (2009) and Knechel et al. (2006) indicate positive relationship between audit firm size and the assurance service provision. Audit firms provide the assurance services which fit their size and technology level Goldwasser, 2005; Alles et al., 2002; Elliott, 1998). There is positive relationship between audit firm size, technology level; and the assurance services provision. Providing assessment of internal audit department as an assurance service is constrained by size of the audit firm (Alademy, 2007).

IT imposes pressure on auditors to update audit techniques. Most of the new techniques that will be required will involve creation of new software and audit models (Vasarhelyi et al., 2010). The potential of technological tools has changed the way external audits are conducted and has made it necessary
enhance the auditor’s toolset and to include specialized teams to evaluate those systems throughout the traditional financial statement audit and other assurance services. (Albrad, 2000) conclude that trust services provision is affected by the technology level of audit firms. Prior research suggests auditors are resistant to the adoption of optional technology, despite evidence that Computer-assisted audit techniques (CAATs) and other tools can increase both the effectiveness and efficiency of the audit process (Payne and Curtis, 2017). The advanced and new level of technology for the audit firms is positively related to the ability of providing assurance services (Goldwasser, 2005; Daigle and Lampe, 2003; Dassen and Schelleman, 2001). IT will facilitate the collection of evidence for assurance services and reducing its cost. This will help audit firm to provide trust services (Mock et al., 2018).

Increasing number of sectors needs industry specialization for ensuring sufficient knowledge of industry nature of the client, its activities, policies, products; which increase the effectiveness of assurance services provision (Awad, 2006). Industry specialization ensures required experience for high level of assurance services provision. Hsieh and Lin (2015) suggest that industry specialist’s auditors are less likely to provide assurance services to clients with higher financial risk. This is consistent with the notion that industry specialist’s auditors have an incentive to protect their reputation when making client acceptance decisions especially since litigation risk increased after SOX (Hsieh and Lin, 2015). Garcia-Blandon and Argiles-Bosch (2017) limit the industry specialization to the published reports for audit firms. The provision of assurance services depends on the proxy of industry specialization to reflect the auditors as specialists.
(Audousset-Coulier, et al., 2016). Auditors with high industry specialization characteristic are more likely to detect misstatements rather than auditors who are irregulars with such industry or with new clients. The global financial crisis reduced investor confidence in industry specialist auditors, that is why it is important to restore this confidence and the role of industry specialization through providing assurance services other than audit of financial statements (Kwon et al., 2007). Consequently, the hypotheses which relate to the audit firm’s characteristics can be formed as follows:

H1: “There is no relationship between audit firm’s size and assurance service provision”

H2: “There is no relationship between level of technology adopted by audit firms and assurance service provision”

H3: “There is no relationship between audit firm’s industry specialization and assurance service provision”

5. Research Scope

This study is limited to assurance services other than financial statement audit and review. Study sample is audit firms which audit all companies listed in the fifteen sectors on the Egyptian stock exchange.

6. Methodology

The current study adopts the quantitative research approach by the logistic regression model, for analyzing the size, technology level, and industry specialization to assurance services’ provision.
6.1 Population and Sample

The study population is all audit firms in the Egyptian business environment. The study sample is all audit firms which audit the listed companies of all sectors in the Egyptian stock exchange for the period from 2013 to 2017, which are 67 audit firms that include audit firms with foreign partners and local audit firms without foreign partners. The study data span a 5-year period, from 2013 to 2017. The full sample includes 67 audit firms which audit all listed companies in the Egyptian stock exchange.

The financial information needed (net sales) to measure the industry specialization variable as one of the independent variables is obtained from the published financial reporting for all listed companies in the Egyptian stock exchange for the five years-period from 2013 to 2017. The assurance services needed to determine the dependent variables is obtained from audit firms reports published for all listed companies in the Egyptian stock exchange for the five years-period from 2013 to 2017.

Study data are collected from:

1- Audit firms in Egypt.
2- Egyptian stock market.
3- Egyptian financial supervisory authority.

6.2 Logistic regression model

Logistic (LOGIT) regression is the appropriate regression analysis to conduct when the dependent variable is binary, even when the sample size is small, It is used to predict a binary outcome (0 or 1), given a set of independent variables. Like all regression analyses, the logistic regression is a
predictive analysis (Maddala, 1991; Stone and Rasp, 1991). The current study adopts the logistic regression model for analyzing data which fit nature of the study where the dependent variable of assurance services’ provision is a binary variable (0 or 1), and the independent variables are classified/binary data (size, technology level, and industry specialization). While using regression models with the ordinary least square (OLS) is irrelevant because they are getting values between ($\infty$ and $-\infty$). Logistic regression is used to describe data and to explain the relationship between one dependent binary variable (Pohlman and Leitner, 2003; Peng et al., 2002). Most accounting researchers recognize that binary responses require careful modeling and the logistic regression model is the usual choice (Ge and Whitmore, 2010).

Research model
The logistic regression model will be developed in order to test this research’s hypotheses as follows:

$$ASPRV = \beta_0 + \beta_1AFSIZ + \beta_2AFTCH + \beta_3AFIDS + \varepsilon_{it}$$

Where:

$ASPRV$ = assurance services’ provision;
$AFSIZ$ = audit firm’s size;
$AFTCH$ = level of technology adopted by audit firm;
$AFIDS$ = audit firm’s industry specialization; and
$\varepsilon_{it}$ = error term
6.3 Variables measurement

Measurement of the research variables can be shown in table (1) as follows:

Table (1): Variables’ measurement

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assurance services’ provision <em>(ASPRV)</em></td>
<td>(1) for providing assurance services other than financial statement audit;</td>
</tr>
<tr>
<td></td>
<td>(0) otherwise</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audit firm’s characteristics</td>
<td></td>
</tr>
<tr>
<td>Size <em>(AFSIZ)</em></td>
<td>(1) partner of foreign audit firm;</td>
</tr>
<tr>
<td></td>
<td>(0) otherwise</td>
</tr>
<tr>
<td>Technology level <em>(AFTCH)</em></td>
<td>(1) for advanced software packages and auditing tools;</td>
</tr>
<tr>
<td></td>
<td>(0) otherwise</td>
</tr>
<tr>
<td>Industry specialization <em>(AFIDS)</em></td>
<td>(1) for ( \geq 20% ) of net sales for clients in certain industry*;</td>
</tr>
<tr>
<td></td>
<td>(0) otherwise</td>
</tr>
</tbody>
</table>

*Industry specialization percentage (%) = [(Net sales) of the audit firm’s clients in certain sector / (Net sales) of the sector clients].
7. Empirical results

7.1 Descriptive statistics

The following table presents the description measures for study variables before testing study hypotheses. Number of the observations was 142 for the selected sample of audit firms (67) due to some audit firms which audit more than one company in different sectors, and there was no missing observation, see table (2). The descriptive statistics for those number of observation used for analyzing each variable of the study variables {(dependent variable is assurance services’ provision “ASPRV”) and (the independent variables are size, technology level, and industry specialization)} by the logistic regression model successively.

The descriptive statistics for assurance services’ provision show total numbers of audit firms that provide assurance services other than audit of financial statements are 16 with percent of (11.3%), while there are 126 audit firms that do not provide assurance services other than financial stamen audit with a percent of (88.7%). Regarding size results in table (2), the frequencies of audit firms as partner of foreign audit firm (53) with percent of (37.3%), while the frequencies of local audit firms without foreign partnership were 89 with percent of (62.7%), which is greater than all partners of the big four audit firms in Egypt and other audit firms with foreign partner in the Egyptian business environment. Table (2) shows convergence regarding technology level between audit firms that adopt advanced software package and auditing tools and other audit firms which use manual system and paperwork or traditional software package and auditing tools.
Table (2):
Descriptive statistics

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Assurance services other than financial statement audit</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Otherwise</strong></td>
<td>126</td>
<td>88.7</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>142</td>
<td>100.0</td>
</tr>
<tr>
<td>Size</td>
<td>Partner of foreign audit firm</td>
<td>53</td>
<td>37.3</td>
</tr>
<tr>
<td></td>
<td><strong>Otherwise</strong></td>
<td>89</td>
<td>62.7</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>142</td>
<td>100.0</td>
</tr>
<tr>
<td>Technology Level</td>
<td>Advanced software packages and auditing tools</td>
<td>68</td>
<td>47.9</td>
</tr>
<tr>
<td></td>
<td><strong>Otherwise</strong></td>
<td>74</td>
<td>52.1</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>142</td>
<td>100.0</td>
</tr>
<tr>
<td>Industry Specialization</td>
<td>≥ 20% of net sales for clients in certain industry (sector)</td>
<td>23</td>
<td>16.2</td>
</tr>
<tr>
<td></td>
<td><strong>Otherwise</strong></td>
<td>119</td>
<td>83.8</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>142</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The number of audit firms which adopt advanced software packages and auditing tools are 68 with percent of (47.9%). While number of audit firms that do not use advanced software packages and auditing tools are 74 with percent of (52.1%). Lastly, results of the descriptive statistics for industry specialization show great difference between audit firms that characterize with industry specialization and other audit firms which do not specialized in certain sector on the Egyptian stock market. The frequencies
were 23 for the industry specialized audit firms with percent of (16.2%), and 119 audit firms that do not specialized in certain industry with percent of (83.8%).

7.2 Tests of logistic regression model

The following tests provide conclusion about relevance of the model to the nature of study data and providing the required statistical characteristics for prediction. Those tests are as follows:

*Chi-square ($\chi^2$) test*

The logistic regression model shows results of Chi-square test and its levels of significance, the test results are equal for each of step, block, and model due to not using the stepwise regression. According to the determined significance level (Sig.) of 5%; the null hypothesis is accepted if the level of significance is more than 5%, while rejecting the null hypothesis if the level of significance is less than 5%. Value of Chi-square is (22.806) at degree of freedom (df) of 5, the Sig.(0.000) is <0.05, which means the model has statistical significance, and the independent variables have significant interaction for classifying audit firms Whether or not to provide the assurance service other than audit of financial statements.

*R^2 test*

(-2 Log likelihood) value is 77.183 which reflect the model efficiency and its ability to predict the decisions (assurance services’ provision). Cox & Snell R Square and Nagelkerke R Square are two statistical measures for Pseudo R-Squares (R2) which help to interpret the results as is the case of the multiple regression. Cox & Snell R Square factor is considered more conservative than
Nagelkerke R Square. Nagelkerke R Square factor indicates that the independent variables of the model (size, technology level, industry specialization, qualifications, and experience) interpret 29.4% of assurance services’ provision, while other variables which are not included in the model interpret the rest (70.6%).

Efficiency test of logistic regression model

Results of classification efficiency and its correct percentage in the sample for the logistic regression model show that the observation is classified in audit firms’ group that provide assurance services if the predicated value is $\geq 50\%$ (0.50), while the observation is classified in audit firms’ group that do not provide assurance services if the predicated value is (0.50). The decision rule permits correct percentage classification ($1 \div 16 = 6.3\%$) of observations that provide assurance services. The observed value of predicated assurance services’ provision is known as Sensitivity Prediction. Also, this decision rule permits a correct percentage classification ($126 \div 126 = 100.0\%$) of observations that do not provide assurance services; which known as Specificity Prediction. In general, the predictions are correct ($126 + 1 = 127$), which means 127 out of 142 observations with a high percentage of 89.4%. The model is more efficient for predicting audit firms which do not provide assurance services compared by the prediction of audit firms that provide assurance services. The decision rule predicts that one observation provide assurance services and the prediction was false for zero observations with false positive rate that equal ($zero \div 1 = zero \%$). While the decision rule predicts that there is no assurance services’ provision for 141 observations and the prediction was false for 15 observations with false negative rate that equal ($15 \div 141 = 10.6\%$).
**Goodness of fit test**

Goodness of fittest reflects the degree of relationship between the dependent variable and independent variables of the model. Hosmer-Lemeshow (H-L) points that the degree of the model relevance and its sufficiency for data. Null hypothesis indicate that the model is relevant and sufficient for data, null hypothesis is rejected if \( P < 5\% \) as indication of low quality for the model. H-L test shows that the degree of correspondence between the model and actual results is good, and \( \text{Sig.} = 0.933 \) is >0.05, the matter which indicates good quality of the model and matching with data.

**Results of logistic regression model parameters**

The Sig. value which is < 0.05 reflects the significance interaction between the independent variables (size, technology level, and industry specialization) and the assurance service provision. Results in table (3) point that Sig. of technology level is < 0.05(Sig = 0.035) which means the relationship between level of technology and assurance services’ provision is highly significant. There is a positive relationship between technology level and assurance service provision; when audit firms use or adopt advanced software packages and audit tools that lead to provide assurance services’ other than audit of financial statements. The second alternative hypothesis is accepted through positive relationship between technology level and assurance services’ provision. This result is consistent with most of previous studies which investigate the relationship between technology level and assurance services’ provision (Lowe et al., 2018; Payne and Curtis, 2017; Vasarhelyi and Romero, 2014; Vasarhelyi et al., 2010; Dowling, 2009; Dowling and Leech, 2007). There is no significance interaction between size and industry specialization of audit
firm with assurance services’ provision due to Sig. values of (0.068, 0.888) respectively which are > 0.05. The first and third alternative hypotheses are rejected due to the insignificant relationship between size and industry specialization with assurance services’ provision, See table (3).

Table (3): Results of logistic regression model

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>B</th>
<th>S.E.</th>
<th>(Wald) test</th>
<th>df</th>
<th>Sig.</th>
<th>{Exp (B)}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>-3.354</td>
<td>1.840</td>
<td>3.323</td>
<td>1</td>
<td>.068</td>
<td>.035</td>
</tr>
<tr>
<td>Technology Level</td>
<td>2.816</td>
<td>1.333</td>
<td>4.463</td>
<td>1</td>
<td>.035*</td>
<td>16.702</td>
</tr>
<tr>
<td>Industry Specialization</td>
<td>-0.096</td>
<td>.681</td>
<td>0.020</td>
<td>1</td>
<td>.888</td>
<td>.909</td>
</tr>
</tbody>
</table>

Conclusion

Results show that the relationship between level of technology and assurance services’ provision is highly significant. There is positive relationship between technology level and assurance service provision; when audit firms use or adopt advanced software packages and audit tools that lead to provide assurance services’ other than audit of financial statements and vice versa. The second alternative hypothesis is accepted through positive relationship between technology level and assurance services’ provision. This result is consistent with most of previous studies which investigate the

*Statistical significance at level of 5%.
relationship between technology level and assurance services’ provision (Lowe et al., 2018; Payne and Curtis, 2017; Vasarhelyi and Romero, 2014; Vasarhelyi et al., 2010; Dowling, 2009; Dowling and Leech, 2007). There is no significance interaction between size and industry specialization of audit firm with assurance services’ provision. The first and third alternative hypotheses are rejected due to the insignificant relationship between size and industry specialization with assurance services’ provision.

The three independent variables were different in value and significance with the assurance services provision. Technology level is highly significant with assurance services provision, while size and industry specialization are not significant with assurance services provision.

This research contributes to the accounting academic literature as it investigates the impact of assurance services determinants on assurance services provision in the Egyptian business environment. Also, this research is shedding the light on the roles of statutory bodies in securing the organizations’ compromises to provide assurance services in the Egyptian exchange stock market. There is a need to assure information usefulness for the decision-makers, especially with the growing investors’ demand of the assurance services after the 2008 financial crises. The online disclosure of reliable and timely information will increase investors’ trust in the financial reporting. Finally, Assurance services open a new market for audit firms in which these firms can increase their revenues by providing new services that attract new customers.
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