Do Investors Benefit from Increased Auditor Independence and Auditor Expertise?

by

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ABSTRACT

An implicit assumption of both audit regulation and research is that more auditor independence and more auditor expertise are better for society because they increase investor confidence and participation in markets. To test this assumption, I conduct a multi-period experiment where investors purchase assets in an environment with Auditor Independence (Independent, Non-Independent), Auditor Expertise (Expert, Average) and Information Asymmetry (High, Low). I find that sellers drastically overvalue auditor independence and auditor expertise in early periods and then, after receiving feedback, adjust their valuations downwards. Buyers do not overvalue auditor independence and auditor expertise and instead produce valuations closer to the expected value of the auditor certification. Auditors (rather than investors) extract most of the benefit of increased independence and expertise, especially in markets with high information asymmetry. There is no indication that increasing independence benefits investors.

Preface

This thesis is an original work by Erin Marshall. The research project, of which this thesis is a part, received research ethics approval from the University of Alberta Research Ethics board, Project Name “Asset Negotiation Experiment”, No. Pro 00042609_REN1, October 17, 2013.

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Introduction and Motivation

"If the accountant were not independent of the management of his clients, his opinion would add nothing" – E.B Wilcox (1952 CPA Handbook)

An implicit assumption of both audit regulation and research is that more auditor independence and more auditor expertise are better for society. In the extreme, the case is often made that in the absence of the highest level of independence, an auditor's opinion is thought to be worthless (Mautz & Sharaf, 1961). However, evidence on the validity of this assumption is lacking. Especially since the advent of the Sarbanes-Oxley Act (SOX), regulators have advanced increasing auditor independence as a primary solution to accounting scandals and market problems. Some of the independence rules passed under SOX have demonstrated a propensity to trade-off independence for expertise (including the prohibition of the joint provision of consulting and audit services (SOX 201), a five-year mandatory audit partner rotation (SOX 203)) and proposals of audit firm rotation. This trade-off is critical because independence and expertise are the two main reasons why investors rely on auditor certification of financial statements (Carey, 1946, Schuetze, 1994). While not many would contest the importance of unbiased, objective financial statements and an auditor who serves the public interest[1], the notion that audit quality is the same as independence, or that no other auditor professional and environmental attributes matter (e.g. expertise, competence, pricing, location, consulting, tax) needs to be questioned (c.f. Power, 2003; Humphrey, Moizer & Turley, 2006; Young, 2006; Jamal & Sunder 2011a). There are even some who suggest

[1] United States v. Arthur Young & Co. (1984) states "the accountant maintains total independence from the client at all times and requires complete fidelity to the public trust" and Nelson (2006) states that the concept of independent accounting experts is ingrained as essential.

that regulation advanced in the public interest has expanded beyond an economically efficient level and is clearly overprescribed (Posner, 1974; Rickets, 2000; Kinney, 2005). This implies that there could be a ceiling effect to the benefits derived from independence and combined with the continued focus by regulators on independence, prompts the question of how this seeming lack of ex-ante consideration of marginal benefits versus costs[2], could impact the investors whom these regulations were intended to protect. Economic Capture Theory raises the question as to whether the primary beneficiaries of regulation are investors or auditors (Stigler, 1971). Specifically, are investors well calibrated in valuing independence and expertise or do they over (or under) value these two important features of the financial reporting environment? Are more independence and more expertise necessarily beneficial and how do they interact under different market conditions to create confidence in markets? Moreover, could independence regulation actually primarily benefit the auditors instead of the sellers? I seek to add to the existing literature by directly measuring the value investors place on both independence and expertise and who primarily benefits from more independence / expertise in markets with high and low information asymmetry.

Answers to these questions are important because to be effective, regulation must produce benefits for those it was intended to benefit. To this end, economists have historically argued that regulation isn't necessary and will not produce a net benefit. This is primarily because there are incentives (e.g. reputation and litigation) for private

[2] Posner (1974) suggests that the cost of determining the quality of regulation is high and the regulators time is valuable so there is not very much assessment of the quality of regulation.

markets to produce sufficient levels of auditor independence and auditor expertise. One popular economic theory of regulation, Capture Theory, advances that regulation may simply be a form of rent seeking (Stigler, 1971) and here, the audit profession would do the rent seeking. In this case, auditors (rather than investors) would be the primary beneficiaries of regulation that mandates higher levels of auditor independence and expertise.

Counter to Capture Theory, the Public Interest Theory of regulation suggests that regulation is appropriate when there is a risk of market failure or similarly, a need to protect the public interest (Posner, 1974). One specific situation under which independence regulation is assumed to garner the most benefit is when there is high information asymmetry. Absent regulation, there is concern that because of information asymmetry between managers and investors, prices would be driven down to lemon prices and securities market would potentially fail (Akerlof, 1970). Independence regulation seeks to reduce this asymmetry by increasing the credibility of financial information on which investors make decisions. Historically, the SEC's mission of protecting investors (SEC, 2004) has been framed consistent with a public interest approach to independence regulation. Still, Posner (1974) argues that "regulation is an honest, yet frequently unsuccessful attempt to promote the public interest". I test this statement specifically with respect to high and low levels of auditor independence in markets with high and low information asymmetry.

Another factor supporting this auditor benefit hypothesis is that research in investor psychology indicates that investors are not well calibrated in assessing the

usefulness of decision-relevant information and specifically are overconfident about their own knowledge and abilities. An individual can be said to be overconfident when she overestimates the probability of her favored hypothesis (Griffin & Tversky, 1992) or simply has unwarranted confidence in her fallible judgment (Einhorn & Hogarth, 1978). Findings supporting overconfidence are some of the most robust findings in psychological and accounting research (Fischhoff & MacGregor, 1982; DeBondt & Thaler, 1995; Han et al., 2011). This is critical because overconfidence has true economic impact. Investors often make poor investing and trading decisions (Odean, 1998), are often taken advantage of by better-informed market participants (c.f. Dittmar, 2000; Pincus & Wesley, 1994) making it uncertain as to whether investors will impound the intended benefits of regulation and expertise. This issue may be particularly problematic in markets with high information asymmetry, where regulation is intended to benefit market participants. In this setting, investors may overvalue independence and expertise in that sellers will overpay the auditor for these attributes and buyers will overpay the seller for assets sold with these attributes. These lost profits specifically from sellers overpaying for auditor independence and expertise would then be allocated to the auditors rather than the sellers.

Further, sellers generally purchase auditor services to increase information credibility. Therefore, part of the decision making process in hiring the auditor (aside from regulatory mandated hiring) involves the seller's perceived value of the auditor to the buyer. This means that sellers' certification value assessments will also be reflective of what they believe to be the buyers' certification value judgments. Nickerson, Baddeley

& Freeman (1987) find that people form perceptions about other's knowledge by imputing their own knowledge on others. In this case, if sellers believe that, for example, auditor independence is crucial for transaction success, they would impute this knowledge onto the buyer and therefore, determine a high value to pay for independence. Overall, this means that if sellers overvalue auditor certification, it is primarily because they believe buyers have a high value for auditor certification. Further, a large literature in psychology and accounting suggests that people are poor at assessing what others think and value (c.f. Jamal & Tan, 2001; Tan & Jamal, 2006). Therefore, it is likely that sellers may not be well calibrated in assessing how much buyers value auditor certification and its attributes (Epley, 2014). Drawing from these literatures, I posit that sellers overvalue auditor independence and auditor expertise.

What further compounds the problem of investor overconfidence and imputing knowledge is the issue of excessive trust. Daniel, Hirshleifer and Teoh (2002) suggest, "Investor credulity and systematic mispricing suggest a possible role for regulation to protect investors." However, sociology based theories of trust propose that investors implicitly trust auditors and professional accountants (Neu, 1991) and also that on average, investors are too credulous and fall prey to manipulation by management and other market participants (Daniel et al., 2002).

It is also important to consider that aside from independence, investors may value other features of the financial reporting environment. One of these features is expertise. The accounting profession has long sought to enhance its expertise through the formation of professional bodies, formal entrance exams and ongoing professional education

requirements. Jamal & Sunder (2011a) suggest that investors may be better served by a balance between preferences for characteristics of the financial reporting environment (e.g. expertise, pricing, competition) and Humphrey et al. (2006) note that perhaps the emphasis on independence has been to the detriment of auditor competence. Power (2003) also states that we should not assume that investor needs are best met by placing independence first and foremost above all other considerations. Although these suggestions are intriguing, there is a limited amount of literature providing evidence as to the features on which investors place the highest value and under which circumstances these value judgments are made. With this study, I seek to add to this debate.

Regulators also often make policy decisions that trade-off expertise for independence without making clear statements about the possible effects of these trade-offs. The trade-off between independence and expertise started centuries ago when craft guilds were audited by committees of members who were originally contracted for their expertise, but quickly became worried about independence (Watts & Zimmerman, 1983). Today, this trade-off has primarily been demonstrated through enhancing auditor independence by prohibiting non-audit services. A trade-off arises because it can be argued that the provision of non-audit services is a functional way to build expertise that may enhance audit quality (c.f. Joe & Vandervelde, 2007, Lim & Tan, 2008). Research has also shown that audit committee members are willing to give up expertise that definitely enhances audit quality in order to gain a perception of independence (Gaynor, McDaniel & Neil 2006). This means that perhaps regulations requiring disclosure of non-audit fees and audit committee pre-approval of non-audit services, have led to the

general view that independence is more important for improving audit quality than is expertise.

Implicit in the regulators' decisions to emphasize independence over expertise is the presumption that investors and users of financial information value and benefit primarily from independence. On the surface, this statement may be quite easy to accept, given that the concept of auditor independence is extremely well established (Mautz & Sharaf, 1961); yet, recent findings may suggest otherwise. Jamal and Sunder (2011a) find that in the baseball card certification market, independence does not pay and cross-sellers who are presumably more competent are rewarded with larger price premiums. Commentary on Jamal and Sunder (2011a) has noted the importance of this type of research for expanding our views of the typical audit markets and the interplay of factors such as independence and expertise (Power, 2011).

To examine these issues I conduct an interactive 2x2x2+1 laboratory experiment where I manipulate Auditor Independence (Independent, Non-Independent) Auditor Expertise (Expert, Average) and Information Asymmetry (High, Low). There is also a No Auditor Certification (None) condition. In the experiment participants make decisions acting as investors, specifically sellers and buyers negotiating the sale/purchase of assets.

Results indicate that sellers overvalue independence and expertise, and because of this overvaluation, the auditor captures the largest portion of market profits. The effect of seller overvaluation of independence and expertise is magnified when transactions take place under high information asymmetry. Buyers do not overvalue independence and expertise and instead perform more rationally and value certification closer to its

expected value. In addition, there is no evidence to suggest the both buyers and sellers strictly value independence more than expertise, and in the low information asymmetry condition, I find that sellers actually value expertise more than independence. Hence, the regulators' current view of enhancing independence over all other auditor features may not be consistent with how investors value independence.

Contribution

The inability to directly investigate the effect of increasing levels of independence in contemporary audit markets means that an experiment is ideally suited to explore the value of independence regulation for both buyers and sellers in financial markets. The use of an experiment also allows me to capture the distinct value and trade-offs between expertise and independence and their interaction with varying levels of information asymmetry, which are not directly observable in the field.

To my knowledge, no research to date directly investigates the value of increasing independence and expertise in a market setting with high and low information asymmetry. Archival research has investigated the incremental value of specific independence regulations or expertise trade-offs (e.g. disclosure of non-audit services, audit committee content changes), but has not taken a holistic approach to the value of independence under various conditions. I am also not aware of any research that specifically investigates how investors price independence and expertise. This study contributes to the current literature primarily by shedding light on investors' ability to value two important features of the financial reporting environment.

This study also contributes to the growing literature questioning the reliance on independence as a primary solution in the audit market and to the ongoing debate about the benefits of regulation. If regulators continue to prescribe rules that significantly change the structure of the audit profession and desire to make these changes with investors' interests in mind, it is critical to have this insight. Regulation is intended to benefit most in settings with high information asymmetry; however, issues with investor calibration suggest that this benefit may not be obtained.

Finally, the paper uses a setting where outcomes can be measured and contributes to the larger literature on how investors react to information asymmetries in markets.

The remainder of the paper is organized as follows: Section II includes the literature review and hypothesis development, Section III discusses the research method and Section IV describes the results and Section V discusses conclusions, limitations and future research.

II. LITERATURE REVIEW & HYPOTHESIS DEVELOPMENT

The literature review begins with a brief history of auditor independence regulation, followed by a discussion of the theories of regulation. Next, empirical evidence on the value of independence and expertise is provided followed by a discussion of investor overvaluation of independence and expertise and trust.

Regulatory Background: Auditor Independence Regulation

Historically, the auditing profession has undergone significant periods of regulation and deregulation and regulators themselves appear conflicted over the value of various types of regulation (Kinney, 2005). Not until the SEC's 1933/34 mandate were

auditors required by law to perform independent audits of publicly listed firms. However, long before that time, because of investor concerns about management conflicts of interest and auditor concerns about litigation and the maintenance of clients, there was private demand for auditing and evidence that the majority of publicly traded companies contracted for independent audits (c.f. Chow, 1982; Watts & Zimmerman, 1983). At present, private companies who are not required by law to hire auditors, also continue to find it in their interest to hire an auditor (Minnis, 2011; Minnis & Sutherland, 2013; Esplin, Jamal, & Sunder, 2014).

After the legal mandate for auditing, there were increasing calls for standardization of audit practice and explicit demand for independence related regulation (Zeff, 2003). Instances of fraud were often thought of as audit failures. These concerns continued into the 1970s and early 1980s where the perception of professional accountants' credibility continued to decline and there was a general feeling that the profession had evolved from a profession of highly ethical skilled accountants to an industry where growth dominated and accountants' ability to serve the public interest was questioned (Zeff, 2003). In response, the SEC's overriding approach was to lose faith in professionalism and self-regulation and rely more on competition and market controls (such as disclosure) to achieve audit quality. Bans on advertising, solicitation and competitive bidding were removed and the profession was forced into a structure that demanded aggressive pursuit of profit and strained professional ethics and values (Zeff, 2003; Kinney, 2005). In essence, accounting scandals caused the SEC to lose faith in

professional regulation (though that type of "talk" continues to occur) and the SEC to rely on market forces to create audit quality.

The trend of relying on market controls continued until 2002 when, to address the accounting scandals, the SEC mandated extensive re-regulation with the passing of the Sarbanes-Oxley Act (SOX) and creation of government mandated regulation via the Public Company Accounting Oversight Board (PCAOB). In 2004, the SEC reiterated through its strategic plan that its mission was to "protect investors; maintain fair, orderly and efficient markets; and facilitate capital formation" (SEC, 2004).

Since then, a combination of professional and market regulations has been in place and the number of reforms made to independence regulation have been considerable and the clear message has been that auditor independence takes precedence over any other feature of the financial reporting environment. For example, some of the independence rules passed under the Sarbanes-Oxley Act (SOX) include the prohibition of performing non-audit services for audit clients (SOX 201), a 5 year mandatory audit partner rotation preventing the establishment of long-term relationships (SOX 203), a mandatory 1 year cooling off period for audit client employment opportunities (SOX 206) and audit committee ownership of the relationship with the external auditor (SOX 301).[3]

Although these regulations have been made for the benefit of the investing public, with the purpose of restoring investor confidence, it is important to recognize that

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[3] It should be noted that auditing is not the only area where regulators have focused on enhancing independence. For example, NASD Rule 2711 *Research Analysts and Research Reports* applies to analysts and prohibits them from receiving compensation tied to future underwriting or investment banking business and mandates disclosure of the percentage of types of recommendations (e.g. Buy, Hold/Neutral, Sell).

regulators have made it clear that they view the value of professional accountants' work is dependent on their independence.

Theories of Regulation

In this study, a central question is to understand who benefits most from audit regulation. Theories of regulation address this by attempting to explain who will receive the benefits and who will incur the costs of regulation. In this sense, there are two competing theories of regulation each proposing different beneficiaries. First, Capture theory[4], strongly influenced by economic theory, and initially proposed by George Stigler in his seminal article in 1971, explains that private interest groups drive and demand regulation hoping to maximize income. Capture theory argues that it is the producer or the industry that demands and creates regulation (Stigler, 1971). Essentially, regulators are captured by industry participants and implement regulation from which the industry benefits. Because the market is viewed as efficient and individuals are viewed as promoting their self-interest through transacting, resources are allocated efficiently and there is no opportunity for regulation to arise out of inefficiencies. Regulation exists primarily to benefit private interest groups and to enhance the profits of the regulated firms. In this setting, audit firms would be the primary beneficiaries of regulation.

Capture theory was refined by Peltzman (1976) who, compared to Stigler (1971), took a less restrictive approach and advanced that the public and others are able to benefit from regulation and it isn't just the private interest groups who benefit. Both authors argue, though, that regulation is a basic product of supply and demand, regulators are

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[4] Capture theory is also often referred to as the economic theory of regulation or Chicago theory. For the purpose of clarity, the term capture theory will be used throughout.

somewhat captured by the industries and that it is the producer or industry that demands and creates regulation. The theory essential presents a rent creation argument for regulation.

If capture theory best explains the existence of regulation, we would expect the auditor to be the primary beneficiary of, and to extract benefits created by independence regulation. This means we would expect auditors, rather than investors to be the prime beneficiaries of independence regulation.

On the other hand, public interest theory argues that regulation is often enacted for the purpose of protecting the public or at least certain public groups (e.g. investors) (Posner, 1974). Public interest theory is usually compared to a standard market failure or welfare economics argument[5] for regulation (Hantke-Domas, 2003). The theory assumes that markets are inefficient and are likely to operate inefficiently or inequitably if left alone. Since market imperfections are seen to justify regulation, the costs of implementing regulations from a producer standpoint are often ignored and the potential benefit to the public is placed in the forefront. However, empirical support for the benefits derived from this regulation is lacking (Posner, 1974).

Public interest theory is motivated by more than concerns about market failure concerns and therefore, can also offer an explanation for the presence of regulation in the face of private incentives. Benston (1985) argues that the services of auditors are desirable because they provide assurance to outside investors that the owners / managers are not providing false reports. Here, regulators are concerned about the welfare of

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[5] Welfare economics assumes that, in a second-best economy, markets are likely to fail to deliver the best allocation of resources. Regulation is one of the mechanisms to intervene for reasons of efficiency (Barr, 1998).

financially unsophisticated investors and by creating independence standards, regulators essentially reduce the information gap between investors, managers and auditors and attempt to redistribute wealth (Healy & Palepu, 2001).

If, as stated by the SEC[6], independence regulation is indeed advanced to protect the public and increase credibility and reliability of financial statements, we should see that investors benefit from the presence of a report by an independent expert when buying and selling assets. This benefit would be seen in the form as higher total profits, more equitable distribution of profits or more completed transactions (economic efficiency). Moreover, as the opportunity for market failure increases (e.g. higher information asymmetry) we would expect the highest benefits to be realized from having an independent auditor, as independence regulation is best served to protect the public under these circumstances.

Overall, based on the current literature, the public interest rational for auditor independence research has garnered more support than capture theory. Although arguments have been advanced that posit that auditor independence regulation is a product of government edict, in their thorough review of the development of auditing over time, Watts and Zimmerman (1983) conclude that auditor independence did not arise for the purpose of enhancing the growth of the audit profession. Instead, independent audits have historically been done voluntarily and auditor independence was a natural and voluntary feature of the auditing environment that was incorporated into law.

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6 The SEC has emphasized, that issues such as independence in appearance should be looked at from the perspective of the "investing public" (Staff Report on Auditor Independence, 1994, 16) and has emphasized the public accountant's "watchdog" function.

Simply taking into account arguments from a regulatory standpoint, we would expect that, consistent with public interest theory, if regulations functioned as intended, investors would benefit most (experience higher profits) under settings with independence regulation than in those without. However, we also need to consider theories and findings from psychology that suggest that investors are not well calibrated when it comes to judging the value of independence and expertise. Thus, I defer my hypotheses until after that discussion and first discuss a specific case for regulation that informs the information asymmetry independent variable.

The Demand for Certification – Information Asymmetry

Regulation is intended when there are possible market imperfections that may lead to market failure. One specific market inefficiency is the existence of incomplete information or information asymmetry. When certain market participants are less informed than others, the market tends to allocate resources inefficiently and the "bads can drive out the goods" (Akerlof, 1970). As information asymmetry increases, common knowledge decreases. Since common knowledge is essential for economic exchange and for creating confidence in markets (Sunder, 1997), the lower the level of common knowledge, the fewer transactions completed and the less total profit that is generated and distributed to market participants. Thus, as information asymmetry increases, so does the demand for assurance and this is when we see that regulation is often introduced to overcome market inefficiencies (Akerlof, 1970).

Applying this concept specifically to auditor certification regulation we see that information asymmetry typically exists between investors and managers. Managers have more information about the future prospects of the company and have significantly more

insight into the company's daily operations. Investors rely on financial statements for decision-making and in turn, rely on auditors to enhance the reliability and credibility of those financial statements. The presence of the auditor in general sends a signal and tends to reduce the amount of information asymmetry between managers and the investors (Spence, 1973). Since, in a financial reporting environment, there is generally poor feedback on financial reporting and audit quality, it is difficult to reduce information asymmetry ex-ante (Davis, 2011) and therefore, adding independence regulation is an attempt to reduce questions about the motives of the certifier and thus, create trust between investors and managers.

Specifically, in my setting, in the realm of transactions between buyers and sellers of assets, absent assurance from professional accountants, there also is significant information asymmetry. Buyers worry that sellers misrepresent and to the extent that trust is lacking between the buyer and seller, this results in lower prices paid for assets and fewer deals made. One way to resolve some of the information asymmetry between buyers and sellers is for the sellers to send a signal that creates trust and confidence in the market. In this study, this signal comes in the form of a certification that mirrors traditional auditor certification of financial statements. This certification should increase the believability of information transferred from the seller to the buyer and signal that enhanced confidence may be warranted (Spence, 1973). This should in turn result in an increased probability of deal completion resulting in higher total profits.

I incorporate information asymmetry into this study to obtain a better measure of the conditions under which independence and expertise are most helpful and most

valuable to market participants. Since independence regulation has been strongly purported to be of greatest benefit in situations with high information asymmetry we should expect to see more value[7] derived from auditor certification in markets with high information asymmetry as compared to low information asymmetry. We would also expect sellers to pay more for auditor certification when information asymmetry is high.

In markets with low information asymmetry, there is not much to reduce or overcome, so the economic prediction would be that certification of any type would have minimal value. However, it should be noted that even in situations where information asymmetry is low, it would be hard to conclude that independence and expertise add zero value. For example, absent the ability of a buyer to perfectly measure the value of the seller's asset, buyers likely always see some value in receiving a report from an independent/expert accountant that provides information on the value of the asset. The extent to which they rely on or place value on the report may be reduced, as compared to under situations with high information asymmetry, but it is unlikely that the information is worth nothing. Independence and expertise have value in their own right and should not be treated simply as a regulatory tool or information asymmetry reduction mechanism.

Do Investors Value Independence and Expertise?

I first start with the fundamental analysis of whether there is empirical evidence showing that investors value independence and expertise. I then discuss the theoretical possibility that investors overvalue these two features.

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[7] Value is defined as the total profits earned by sellers and buyers. This takes into account the amount paid for the certification (for sellers) and the settlement price.

A) Independence / Independent Certification

In capital markets, there exists a fundamental demand for certification by a certifier who is independent of the financial information. This demand has a long history where stakeholders concerned about conflicts of interest insisted on independent audits even prior to the SEC's 1933/34 mandate (DeAngelo, 1981; Chow, 1982; Watts & Zimmerman, 1983). This demand stemmed from a concern about management conflicts of interest and desire to add credibility to the financial statements[8] and thus, as of 1926, over 90% of industrial companies listed on the New York Stock Exchange were audited (Zeff, 2003). Further, we see evidence of independent auditing even in private markets where banks require independent audits of financial statements (Leftwich, 1983; Minnis & Sutherland, 2013; Minnis, 2011) and where private companies that obtain audits under a voluntary regime enjoy a reduction in the cost of capital (Lennox & Pittman, 2011).

There are several current studies that support the view that market participants are willing to pay for and value independence. Mayhew and Pike (2004) provide evidence that independence matters in a market economy in that market surplus is increased in conjunction with a reduction in independence violations. They find that investors prefer more independent auditors as this provides value through ambiguity reduction and thus, reduces the ambiguity faced when bidding on assets.[9] They also find that investors are

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[8] Another reason to conclude independent certification has value is because of its ability to reduce concerns about the bias of the certifier (Dranove & Jin, 2010). The simple act of attaching an independence signal to a certification serves to reduce these concerns.

[9] Note that in Mayhew & Pike (2004) investors bid on a specific asset and not just certification in general. Also, the experimental conditions do not incorporate costs into acquiring independent information (e.g. the investor selects the auditor and additional costs are not incurred for this action). Thus, it is possible that, because of the additional cost incurred, although I expect independence to be valued, the preference for independence may vary based on the level of information asymmetry. This possibility is discussed in the trust, overconfidence and information asymmetry section of the literature review.

willing to pay more for more independent auditors and that auditors are hired less when they have more independence violations.

Chen and Chen (2009) investigate NASD Rule 2711, which was meant to enhance analyst independence. The authors find that not only did Rule 2711 actually enhance analyst independence (as evidenced by an increase in the relationship between stock recommendations and stock price relative to intrinsic value) but also that the value of Strong Buy recommendations increased.

Francis (2006) finds that users of financial statements perceive that non-audit services impact independence in appearance although they may not actually violate independence in fact. What's more is that these perceived reductions in independence have a negative impact on value in that companies that pay their auditors high levels of fees for non-audit services experience lower stock prices (Francis, 2006).

Despite all of the studies showing positive value for independence, there is also evidence that the potential incremental gains from additional independence regulation have perhaps reached their peak, which may imply a ceiling effect for the value of independence. For example, little added value is perceived from regulations such as mandatory partner rotation (Kaplan & Mauldin, 2008). Jamal & Sunder (2011a) find that independence doesn't always create higher profits for certifiers and Fiolleau, Hoang, Jamal and Sunder (2013) find that despite regulation to the contrary, management still has significant influence with respect to auditor selection decisions.

Overall, the evidence favors the fact that investors do value independence and sellers would be willing to pay for independent certification. What isn't clear is whether

the maximum level of independence is always desired and whether market participants correctly price auditor certification.

B) Expertise / Expert Certification

One of the primary research questions surrounding expertise is whether it has a value divorced from independence. The motivation for this stems from the fact that although accountants are hired for their various types of expertise (e.g. general domain knowledge, subspecialty knowledge, world knowledge and general problem solving ability (Bonner & Lewis, 1990)), given the amount of regulation surrounding independence of these expert accountants, it is questionable as to whether the expert aspect of the profession has maintained its value. For example, if an auditor were simply an industry expert, would he command a fee premium if he were not independent and what would be the magnitude of the difference? To this end, it is clear that expertise has value in society. Individuals and corporations use expert services for a variety of reasons, whether to obtain a valuation for a company up for sale or for something as mundane as the purchase of a toaster or restaurant review (Jamal & Sunder 2011b). Giddens (1990) suggests that Western society is predicated upon the trustworthiness of established expertise and we know that individuals are in such need of assistance that they tend to follow the advice of naïve advisors, hardly more expert than they are, when making decisions (Schotter, 2003).

The value of accounting expertise has also been emphasized via several regulations intended to enhance expertise. For example, under SOX, audit committees are required to have at least one accounting expert. Defond, Hann and Hu (2005) find that the

market reacts positively to the appointment of an accounting expert to the audit committee, indicating that the market believes that increased accounting expertise improves financial reporting quality.

There is also a program of research that looks into the audit fee premium for expertise. Francis, Reichelt and Wang (2005) find that audit clients are willing to pay a 19% fee premium when the auditor is the joint national and city industry leader. However, this fee premium is enjoyed only by the top ranked industry expert, which implies that the highest expertise commands a higher price than just expertise in general. Balsam, Krishnan and Yang (2003) find that Big 4 firms' larger offices demonstrate higher audit quality stemming from more expertise in performing SEC registrant audits. Similarly, Reichelt and Wang (2009) find that city and national industry expertise also translates to better audit quality. However, a recent paper by Minutti-Meza (2013) finds that after controls are placed for client characteristics, there is no significant association between industry expertise, audit quality and fee premium.

Fiolleau et al. (2013) show that one of the consequences of the mandatory partner rotation requirement was that instead of retaining the incumbent audit firm with a new partner, the client instead put the audit up for bid. The primary reason for this was that the audit committee chair and the CFO both valued the industry expertise of the current partner and didn't feel that this could be achieved with the new partner.

On the other hand, there is emerging evidence that individuals have a strong appetite for certification that isn't necessarily expert (c.f. Jeacle & Carter, 2011; Jamal & Sunder, 2011b). For example, Jeacle and Carter (2011) suggest that in the travel market,

there seems to be a new construction of expertise that is more user based instead of professional based. Jamal and Sunder (2011b) present similar findings in that the market accepts varying types of expertise with respect to certification and that individuals are willing to carry out transactions under these conditions.[10] In both studies, the experts are not necessarily independent, nor does this seem to be fatal to the functioning of these markets.

Overall, it appears that audit clients are willing to pay for higher levels of expert certification of financial statements, which implies that expertise adds additional credibility or value to their financial statements, which in turn would benefit investors. Thus, we would also expect sellers to pay for this expertise and the amount paid for expertise would be higher for high expertise vs. low expertise auditors.

However, because of the inability to measure the existence of expertise absent independence archivally, it still isn't clear in this literature what portion of the value of expertise is dependent on the auditor's independence. In this vein, there is evidence that there is widespread demand, in markets other than auditing, for expert opinion even without independence (Jamal & Sunder, 2011a,b). This demand seems reasonable, as experts with vested interests likely possess the most applicable expertise (Stark, 2005). To this end, it is often argued that auditors may be better prepared to handle advanced accounting problems when they also offer consulting services to audit clients (Moore,

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[10] It should be noted, that as compared to an audit market, markets for travel and baseball cards differ with respect to the risk of the choices made and level of information asymmetry. For example, when an individual makes an investment decision, she is relying on an expert auditor to reduce a significant information asymmetry between herself and management. Although information asymmetry does exist in the markets investigated in the cited studies (e.g. hotel stays, jewelry, wine, etc.) it is recognized that the level of asymmetry and the consequences of the decisions are lower and ex-post feedback on these goods/ services is much more apparent than with audit quality or financial reporting quality.

Tetlock, Tanlu & Bazerman, 2006). Lim and Tan (2008) find evidence that audit quality increases with the level of non-audit services acquired from industry specialist auditors compared to non-specialist auditors. Gaynor et al. (2006) find that investors prefer some apparent decrease in independence, at least in appearance, from the provision of non-audit services, if it means audit quality will improve.

So, there is some evidence suggesting that expertise does have a value divorced from independence in that it increases users' perceptions of quality. Thus, we can expect sellers would be willing to pay for certifications with expertise in situations with and without independence.

Do Investors Overvalue Independence and Expertise?

If investors are properly calibrated we expect to see a pattern of results that is fairly straightforward. First, in general, higher expertise and higher independence will be more valuable than lower expertise and lower independence. In markets with low information asymmetry, neither independence nor expertise will have much value and in high information asymmetry both features will have some value to the extent they create market confidence and facilitate deal making. This argument is consistent with economic models of investor behavior that assume investors are rational utility maximizers. Psychological theory has been advanced that challenges this basic assumption of behavior and explains that investors are not rational and instead are poorly calibrated[11] and exhibit systematic biases that affect behavior and can lead to suboptimal outcomes.

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[11] Calibration is the match between the subjective and objective or the correspondence between what people actually know and what they think they know (Alba & Hutchinson, 2000). Calibration is the match between accuracy and confidence and few people are well-calibrated (Kahneman & Riepe, 1998).

One of these calibration biases is overconfidence. Overconfidence occurs when an individual overestimates the precision of her own knowledge (or her own judgment). An individual can be said to be overconfident when she overestimates the probability of her favored hypothesis (Griffin & Tversky, 1992) or simply has unwarranted confidence in her fallible judgment (Einhorn & Hogarth, 1978).[12] Overconfidence has been observed both in participants in laboratory studies and also in professionals such as lawyers (Wagenaar & Keren, 1986), negotiators (Neale & Bazerman, 1991), and security analysts (Stael von Holstein, 1972) even when these people are well motivated and it is in their best interests to be well-calibrated. Overconfidence has been called the most robust finding in psychology of judgment (DeBondt and Thaler, 1995) and although overconfidence is not universal (in that it usually disappears with relatively easy items, but is exaggerated as task difficulty increases (Griffin & Tversky, 1992)), it is prevalent, often massive, and difficult to eliminate (Fischhoff & MacGregor, 1982).

Overconfidence is an important phenomenon because confidence controls action (Heath & Tversky, 1991) and we therefore observe real economic consequences from overconfidence. Assessing the extent to which these economic consequences represent benefits or cost, however, is of utmost importance. From a rational economic standpoint, the accepted view is that psychological biases, including overconfidence, make markets less efficient by creating mispricing. This has been demonstrated in studies showing that overconfidence results in excessive trading volume (Odean, 1999), excess volatility

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[12] A common numerical example of overconfidence is when an individual claims that they are 95% certain that there are, for example, between 100 and 200 jelly beans in the jar. Overconfidence arises when the actual number of jelly beans falls outside the 95 percent confidence boundary.

(Odean, 1998; Daniel, Hirshleifer and Subrahmanyam, 1998), and mispricing of assets (Hirshleifer, 2001; Daniel et al., 1998). Firms have also been shown to exploit investor overconfidence by, among other activities, trading on misvaluation of shares (c.f. Dittmar, 2000) and adopting income increasing accounting policies to artificially improve investor perceptions (c.f. Pincus & Wesley, 1994). The increase in trading volume is the most robust (Odean, 1998) of the real market effects of overconfidence. Excess trading has an overall negative effect on an individual's expected utility because more trading generates transaction costs, and generally leads to poor performance and a decrease in wealth (Barber & Odean, 2000). There have also been strong statements in the psychology literature that it is doubtful that the benefits of overconfidence outweigh the costs (Griffin & Tversky, 1992).

Overconfidence also has real costs in negotiation settings where overconfidence is the norm (Neale & Bazerman, 1985) and where people generally overestimate their chances of success (Einhorn & Hogarth, 1978). Specifically, the level of confidence with which negotiators evaluate the likelihood of an offer being accepted directly impacts the negotiator's willingness to concede (Neale & Bazerman, 1983). Overconfidence thus decreases the probability that the negotiator will concede as they misjudge the amount of compromise necessary to reach a deal (Neale & Bazerman, 1983; Neale & Bazerman, 1985). This leads to fewer completed transactions and fewer profits generated.

Demonstrations of overconfidence are not limited to domains with perfectly reliable information (e.g. high independence or high expertise). Studies have found that people make equally strong inferences and are equally overconfident no matter the

predictive value of the information. Individuals behave like information is to be trusted regardless of its source, accuracy, reliability, etc. (Fiske & Taylor, 1991). In total, individuals rely too heavily on unreliable signals and too little on reliable signals and make insufficient adjustments for signals of decreased credibility (Griffin & Tversky, 1992). This effect can be explained by the fact that people focus on the strength of an argument rather than its weight or credibility (Griffin & Tversky, 1992).

In this setting, I define overconfidence as investors' beliefs in their abilities to estimate the value of the asset and subsequently obtain profit from the sale or purchase of that asset. In addition, as the primary research question relates to the value of auditor certification, I also define overconfidence as sellers' estimates of the degree to which auditor certification will benefit them in realizing this profit / will add to buyers' willingness to pay for an asset. With these definitions in mind, I first expect, consistent with the robustness of the overconfidence effect, that investors will be overconfident. Specifically, if investors overvalue independence and expertise, sellers will over-pay for certifications and buyers will over-rely on certifications in judging the price they should offer for the sellers' assets.

Trust

There exists a second possible reason why investors may overvalue independence and expertise. This reason is trust. Giddens (1990) defines trust as a continuous state that is a device for coping with the freedom of others because of a lack of full information. Specifically, trust is "confidence in the reliability of a person…regarding a given set of outcomes or events, where that confidence expresses a faith in the probity…of another, or

in the correctness of abstract principles (technical knowledge)." In general, people tend to trust as a default (Gneezy, 2005) and are naturally trusting even of those more naïve than they are (Schotter, 2003). In an accounting domain we see that, on average, investors may be too credulous and thus, fall prey to manipulation by management and other market participants (Daniel et al., 2002).

If we understand that at a base level, people tend to over-trust or naturally trust, it may be the case that trust simply exists until it is broken. We also know that for the formation of common expectations, trust has to exist a priori for any economic exchange to take place.[13] Therefore, I could predict that any auditor certification will increase trust and therefore, increase the probability of deal completion. However, since the study involves the value derived from auditor certification, what I seek to establish is that the general public also extends this natural, excessive trust specifically to auditors/ professional accountants and that this contributes to overvaluation of certification. To this end, Giddens (1990) suggests that Western society is predicated upon the trustworthiness of established expertise. The auditing function and the public accounting profession are two of these systems of expertise, which facilitate trust (McMillan, 2004). Professional accountants' role as experts is critical because users' continued reliance on financial statements is closely related to the perceived trustworthiness of the information.

Accounting research typically makes statements about the extent to which individuals trust auditors. For example, Koch and Schmidt (2010) simply state that individuals inherently trust auditors/professional accountants and McMillan (2004)

[13] I accept that there needs to be a base level of trust between the buyer and seller to enter into a transaction; however, the focus of this study is on the additional layer of trust created by auditor certification.

suggests an implied trust in using the statement that the value of an audit firm is in "conferring trust on company accounts through the implicit trust they [hold] in the financial community". There are several arguments for why it may be reasonable to assume that society, as a whole, trusts auditors. The first argument is that the self-regulating nature of the profession is seen as a source of trust (Lehman & Tinker, 1987). Second, because auditors have incentives, such as reputation and litigation, to behave honestly (Watts & Zimmerman, 1983) society can trust them. However, the support for these arguments in arriving at an assumption of trust is weak (Neu, 1991).

Instead, the view adopted by Neu (1991) elegantly captures an understanding of why society implicitly trusts auditors. Society consists of informed and uninformed users. Informed users are stakeholders such as management, shareholders and members of the financial community and uninformed users are all other stakeholders including the general public (Neu, 1991). Because of their repeated interactions with auditors and increased level of accounting domain knowledge, informed users are able to form their own opinions about auditors' trustworthiness. On the other hand, uninformed investors do not have accounting knowledge and have no interactions with auditors (the auditor is essentially invisible) and can only rely on society's expectations and communications about auditors (Neu, 1991). Overall, because of a lack of accounting knowledge and the absence of alternative experiences with auditing professionals, uninformed users have little choice but to trust professional accountants (Neu, 1991). Trust is seen to begin where knowledge ends.

Neu's (1991) view that knowledge creates trust is consistent with Mayer, David

and Schoorman (1995) who focus on ability as one of the important antecedents to interpersonal trust. The authors define ability as a ‘‘group of skills, competencies, and characteristics that enable a party to have influence within some specific domain’’ (Mayer et al., 1995, p.717). The extent to which an individual believes that another party will provide accurate and reliable information determines the level of trust.

Seller and Buyer Differences

In this setting, this level of trust will be particularly important for the sellers' decision making. Specifically, the sellers' ability (or inability) to estimate the value of auditor certification to the buyer will play a large role in determining the price paid for auditor certification. If it is believed that sellers will overvalue certification, it generally extends that sellers will use this overvaluation judgment to calibrate their estimate of the buyers' certification valuations. In other words, sellers will impute their knowledge of what is valuable for profitable transactions onto the buyer (Nickerson, et al., 1987) and if sellers pay a high value for auditor certification, it is because they believe buyers also place a high value on auditor certification.

In addition, there is well-documented evidence that people are not well calibrated in making decisions (c.f. Alba & Hutchinson, 2000; Epley, 2014). This means that seller judgments about the extent that buyers value auditor certification are likely incorrect and thus, result in high prices paid for auditor certification.

Overall, the combination of overconfidence, trust and the need to impute the buyer's certification value will cause sellers to miscalculate the expected value of the certification to the buyer and overvalue auditor independence and auditor expertise.

Buyers have to determine their own value for independence and expertise and don't have to engage in a mind reading exercise to determine what these attributes are worth to someone else. So, buyers are unlikely to make the attribution errors that sellers are vulnerable to make. Buyers are thus more likely to be accurate in assessing the value of independence and expertise.

H1a: Sellers overvalue auditor independence and expertise and therefore, sellers will be less profitable when purchasing auditor certification compared to when not purchasing auditor certification.

H1b: Buyers will offer higher purchase prices for assets with auditor certification as compared to assets without auditor certification.

H1c: Buyers will not overvalue certification and will be no more profitable when purchasing assets without auditor certification than when purchasing assets with auditor certification.

In conjunction with the above hypotheses, because of the overvaluation of independence and expertise, the auditor will be the beneficiary of certification instead of this benefit being allocated to the buyers and sellers in the form of profits. In other words, if sellers over-pay for certification and do not subsequently benefit from this in the form of sufficiently high selling prices, the profit instead will be allocated to the certifier. This is consistent with Capture Theory (Stigler, 1971) and a rent seeking argument, whereby auditors demand regulation as a way of extracting rents. Although this perspective has been discounted by some scholars (c.f. Watts & Zimmerman, 1983) who argue against the evolution of government regulation of auditing being for the benefit of auditors, it still may be the case that due to seller overvaluation, the majority of the profits are indeed captured by the auditor. This means that auditors, instead of sellers will be the

beneficiary of auditor independence and expertise. Because, in relation to total market profits, sellers will contribute the most to overvaluation (by way of bearing the cost of the certification), the hypothesis below is stated in terms of a comparison of seller and certifier profits, rather than both buyer and seller profits.

> ***H2: Because sellers overvalue auditor independence and expertise, auditors will be the main beneficiaries (earn a higher proportion of total market profits) of increased levels of independence and expertise.***

Overconfidence, Trust and Information Asymmetry

High Information Asymmetry

In markets with high information asymmetry, the seller has significant private information as to the value of the asset and it is more difficult for the buyer to estimate the value of the asset. Here, it may be the case that the seller will not pay for the certification in order to keep his/her information advantage. However, if the seller only sends his/her own signal based on private information, the seller's ability to convince the buyer to enter into trade at a sufficient price is low, the level of trust will be low and the probability of an impasse will be high. Accordingly, it is more important for the seller to garner the buyer's trust in markets with high information asymmetry than in markets with low information asymmetry. Moreover, for contracting to occur in markets with high information asymmetry at a price that is satisfactory to both the buyer and seller, the information asymmetry must be decreased (Akerlof, 1970). There are two complementary ways in which this information asymmetry could be decreased: trust and regulation.

Since independence regulation is aimed at preserving perceptions of trustworthiness (Kinney, 2005), regulation can foster trust especially in markets with high information asymmetry (Zucker, 1986). Regulation serves to increase predictability of behavior (Neu, 1991) and to create common knowledge (Sunder, 1997). Regulations that involve auditor independence create the knowledge that the likelihood of being cheated is lower than it would be without independence. Thus, we could expect that as independence increases, so does the level of trust placed on the certification by the buyer and seller. Also, since the extent to which an individual believes another party will provide accurate and reliable information determines the level of trust, it may be the case that as independence and expertise increase, the level of trust increases and therefore, the number of deals completed also increases. This means that, to facilitate common knowledge, in markets with high information asymmetry, the seller will value expert/ independent certification more than they would in markets with low information asymmetry. It also means that sellers will likely value higher levels of independence and expertise more than lower levels of independence and expertise in markets with high information asymmetry.

With respect to markets with high information asymmetry, we know that signals in uncertain environments have more value when they are credible and accurate (Spence, 1973). Since the credibility and accuracy of the signal increases with increases in independence and expertise, it is likely the case that higher levels of expertise are more valued in markets with high information asymmetry. However, because of the inherent value of a professional accountant, just because expertise is low and independence is low

does not mean that those signals are not credible or perceived to be inaccurate. There may in fact be a ceiling effect on the value of independence and expertise.

Taken as a whole, if independence and expertise are expected to have more value as information asymmetry increases and if sellers overvalue independence and expertise I posit the following:

H3: Overvaluation of certification reduces the incremental benefit of certification in markets with high information asymmetry and therefore, sellers will be less profitable in high information asymmetry as compared to low information asymmetry.

Trade-off of Independence and Expertise

In this study I am also able to investigate the interaction and trade-off between independence and expertise. In other words, what is the magnitude of any differences in amounts participants are willing to pay for independence versus expertise and how do these trade-offs affect profits in markets with high and low information asymmetry? What inspires more confidence in the reliability of the underlying information or are the two features inextricably linked?

On the surface, it may seem as though the answer is obvious in that independence is the clear winner in both high information asymmetry and low information asymmetry. The main goals of independence are to inspire market confidence, protect investors, reduce information asymmetry and enhance reliability of financial statements via information risk reduction. However, based on the current literature, the answer to this question is not clear. What we do know is that regulators consistently trade-off expertise for enhanced independence. Some examples of this trade-off are the shift from AICPA peer reviewed audits to PCAOB inspections, the prohibition of non-audit services to

enhance independence in appearance and finally mandatory partner rotation requirements.

Lennox and Pittman (2010) have studied the shift from AICPA peer reviewed audits to PCAOB inspections and they find that there is a lack of informational value in the PCAOB inspections and suggest that we may know less about audit quality under the new regime. Defond (2010) suggests that one possible reason for this decreased information about audit quality may lie in the trade-off between independence and expertise.

With respect to the trade-off between expertise and independence with non-audit services, the general conclusion is that although they do not impair auditor independence, they definitely affect investor perceptions of independence in ways that have real stock price effects (Francis, 2006). Yet, Gaynor et al. (2006) find that investors are willing to trade-off some independence for expertise in that they prefer an increased level of non-audit services when they enhance audit quality (via expertise). In addition, studies of mandatory partner rotation find that there is no added value perceived from the additional independence gained over the loss of expertise from partner rotation (Kaplan & Mauldin, 2008). Further evidence of the fact that independence may not always be primary is seen in the advice literature where individuals often rely on advice even in the face of disclosed conflicts of interest (Cain, Loewenstein & Moore, 2005) and on advice that is not independent and isn't even necessarily expert (Jeacle & Carter, 2011, Jamal and Sunder 2011b).

There are also studies that show that independence does not pay in the presence of other environmental characteristics. For example, Jamal and Sunder (2011a) find that independence alone does not guarantee success. Interestingly, they report that certifiers heavily involved in the cross selling of services receive the highest price premiums and as such, in some markets, perceived expertise from cross-selling dominates independence concerns. Jamal and Sunder (2011a) investigate the baseball card market, which has relatively low information asymmetry compared to traditional audit or asset markets.

Overall, it isn't clear as to whether independence or expertise consistently dominates the other with respect to investor preferences. What does come to light is that expertise is indeed valued by market participants, even when information asymmetry is relatively low and expertise isn't necessarily needed. Also, although the evidence is mixed, independence appears to be valued more than expertise in markets with high information asymmetry. Therefore, there is a possible interaction between the type of certification and information asymmetry. Specifically, it may be the case that investors value expertise more than independence in markets with low information asymmetry where fears of being cheated are not as high and therefore, independence is not as desired. Also, from a practical standpoint, in markets with low information asymmetry, it is likely most salient for the seller simply to obtain better information about the value of the asset, no matter the independence of the provider. If the buyer can also estimate her own value of the asset, it is not as important for the seller to communicate that his/her measure of value is purely objective.

H4: In markets with high information asymmetry sellers will more highly value independent as compared to expert auditor certification and in markets with low information asymmetry sellers will value more highly value expert as compared to independent auditor certification.

The Effect of Feedback on Certification Pricing and Overvaluation

If buyers and sellers are not well calibrated, it seems reasonable that calibration should improve with feedback (Alba & Hutchison, 2000). However, we also know that people maintain confidence in their abilities despite regular feedback (Gilovic, 1983; Gilovic & Douglas, 1986) and that good calibration requires both specific feedback about the accuracy of judgments and attention to that feedback (c.f. Arkes et al 1987; Keren, 1991). In this setting, buyers and sellers will receive feedback with respect to the amount of profit or loss made in each round. However, buyers and sellers will not receive feedback on their relative profits / losses. This inability to distinguish good from bad performance in the environment means that the simple profit / loss feedback will likely not be effective in reducing calibration errors (Kruger & Dunning, 1990). In turn, providing feedback on sellers' relative performance (the most profitable seller's certification choices will be revealed once after the third round) may be more helpful in reducing overvaluation of auditor certification. Specifically, if we expect sellers to overvalue certification, it is likely that the feedback will reveal that the most profitable sellers are those not purchasing certification. In turn, sellers purchasing certification could either decrease the price paid for certification or refrain from purchasing certification subsequent to feedback.

Buyers will also need to interpret the relative feedback provided. If the most profitable seller has purchased certification, it is reasonable that buyers will reduce the

offer for assets with certification. Similarly, if the most profitable seller does not purchase certification, the buyer would likely interpret this as certification not having much value. In addition, since the feedback is prompting the buyers to consider sellers' profitability specifically, it is likely that an overall decrease in the prices paid for the assets will occur. Overall, we would expect to see a decrease in the price paid for assets with and without certification.

H5: Feedback will reduce the price sellers pay for auditor certification, but will not fully eliminate overvaluation of certification.

H6: After feedback, there will be no difference in the price buyers pay for assets purchased with and without certification.

III. METHOD

I employ a 2x2x2+1 experimental design where I manipulate Auditor Independence (Independent, Non-Independent) Auditor Expertise (Expert, Average) and Information Asymmetry (High, Low). There is also a No Auditor Certification (None) condition. Participants were also assigned the role of Buyer or Seller.

Procedure/Experimental Setting

Participants negotiated the sale of an asset in buyer-seller dyads and were randomly assigned to the role of buyer or seller and held those roles for the duration of the experiment.[14] When participants entered the laboratory they were asked to choose

[14] The labeling of participants' roles is a critical experimental decision (Haynes & Kachelmeier, 1998). I chose to use the labels of auditor and sellers and buyers providing the context under which the decisions will be made. It is critical in this experiment that the participants believe the information comes from a real auditor who is bound by a code of ethics and other features of the auditing environment. This context is critical to the interpretation of the theoretical impact of the role of auditor on investors, especially trust. Also, with the labels of buyer and seller there should not be any concerns about inviting an inordinate amount of role-playing, as participants are undergraduate students who are not normally engaged in the purchase and sale of assets on a frequent basis.

one of ten blank computer stations. As soon as all ten participants had arrived, participants were instructed to double click the experiment shortcut icon on the desktop. Depending on the order in which participants double clicked, the computer assigned them the role of buyer or seller. The first person to double click was a seller, the second was a buyer, the third was a seller and so on until the tenth participant. There were always five buyers and five sellers in an experimental session. Each seller was randomly matched with a different buyer each round (this information was disclosed to the participants). Since there were five sellers and five buyers, there was no opportunity for reputation formation / no repetitive play with the same buyer or seller. Also, participants were not aware of who they were playing against in a particular round.

When designing the experiment, the first step was to choose the asset values. To ensure the asset values were reasonable and were within a reasonable range, similar values to those used in Cain et al. (2005) were chosen[15] and then each asset value was randomly assigned to a round. As a result, the sellers' five assets had the following values: Round 1: $129, Round 2: $123, Round 3: $191, Round 4: $165, Round 5: $184.

Next, to ensure there was room for both buyers and sellers to profit from a transaction, the assets were assigned different values for the buyers. Consistent with the bilateral bargaining literature (c.f. Samuelson & Bazerman, 1985; Ball, Bazerman & Carroll, 1991) the starting point for the buyers' asset values was 50% more than the sellers' values. This 50% increase, although large, is reasonable as when a buyer

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[15] Cain et al. (2005) used coins in their experiment and, therefore, as they were able to use small denominations the actual dollar value of each jar was quite low. The jar values used in this study replicate those of Cain et al. (2005) and simply remove the decimal place and drop the last cent (e.g. $19.83 becomes 198 jelly beans).

purchases a company, for example, he/she purchases it because it is worth more to him/her than it is the previous owner (e.g. synergies are created).[16] Since the first seller asset was worth $129, a 50% increase in value for the buyer resulted in the buyer's first asset as $193, or $64 higher than the seller's value. To ensure the potential for profit was not manipulated, since the buyers' first asset was $64 higher than the sellers', this differential was applied to the remaining assets resulting in the following asset values for the buyers: Round 1: $193, Round 2: $187, Round 3: $255, Round 4: $229, Round 5: $248. Participants were not told the value differential between the buyer and seller assets.

Each asset was represented by an array of 40 red, blue and white (blank) squares arranged in a 5x8 rectangle on the computer screen. The squares were each assigned a range of possible values. A range was used to ensure the participants could not calculate the exact asset value. For sellers, red squares were worth between $2-$4 and blue squares between $4-$6. For buyers, red squares were worth between $4-$6 and blue squares between $6-$8. This information was given to the participants. Blank squares could be either red or blue, but the participant was not informed of the color.

To determine the array for each asset, I first varied the percentage of red and blue squares that would be displayed for each asset. The lowest value asset was assigned 70% red and 30% blue, the second lowest 60% red and 40% blue, the third lowest 50% red and 50% blue, the fourth lowest 40% red and 60% blue and the fifth lowest (or highest value asset) 30% red and 70% blue. Participants were told that the proportion of red and

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[16] Note that I also decided to use a 50% gap in the asset value to ensure a high probability of transaction completion (e.g. plenty of room for buyers and sellers to profit / agree on a selling price). Thus, I don't expect and don't find a difference in the number of completed transactions across conditions.

blue squares would change each round, but were not given the exact percentages.

Based on the above percentages, I assigned a value to the red and blue squares that would result in the pre-determined asset values. The exact value of each square was not important to the experiment, but since the participants were told the range of possible values for the squares, it was important that it was possible that the value ranges chosen and the proportion of colored squares displayed could sum to the true asset value.

The experimental procedure detailed in Appendix A was run for a total of five rounds[17]. The experiment was not run as a full factorial. Instead, an Information Asymmetry condition (High or Low) was randomly assigned[18] to each session and sellers were allowed to bid on all types of certification in each round. Since each seller could win the bid for only one type of certification in each round, each certification type, except for None, could exist in a session as many as five times and as few as zero times. The None certification could exist up to 25 times per session. For additional procedural details please see Appendix A.

Independent Variables

The independent variables were manipulated using the number of boxes displayed to the buyer. The seller always had 36/40 boxes displayed and this did not change with

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[17] Five rounds were chosen, consistent with Cain et al. (2005). Five rounds is a reasonable number of rounds as the goal is to keep each experimental session under one hour (this allows for approximately 7-8 minutes per round plus instruction time). This also ensures that the hourly pay rate is reasonable ($10 is the minimum participation fee), ensures a reasonable number of participants will participate and that they will not tire during the experiment.

[18] If there were 2 experimental sessions scheduled for one day, the first information asymmetry condition would be randomly drawn using a random number generator (1 being low information asymmetry and 2 being high information asymmetry). If the first number drawn was low information asymmetry then the next session would automatically be high information asymmetry.

certification, but the number of boxes displayed to the buyer[19] increased depending on the type of certification purchased by the seller. The reason the number of seller boxes was kept constant was to avoid confusion with respect to why the seller was purchasing certification. For example, if both the seller's and buyer's number of boxes increased with certification, it would not be possible to determine if the seller was purchasing certification for his/her own benefit or for the buyer's benefit. Although there are no direct hypotheses in this regard, it would still add an element of uncertainty to participants' decision making that would complicate the interpretation of the results. In addition, it is more likely that the owner of the asset (the seller) already has sufficient information about the value of the asset without the auditor's help. Therefore, similar to purchasing an audit of financial statements for investor benefit, the certification in this experiment only benefited the buyer (with respect to the number of boxes displayed).

[19] Buyers started the experiment with either 20/36 (high information asymmetry) or 28/36 (low information asymmetry). Please see additional discussion below under information asymmetry.

Expertise

Expertise was manipulated by changing the width of the range[20] around the true value of the asset by differentially increasing the number of boxes displayed depending on the type of certification provided. This is consistent with McKenzie et al. (2008) who find that experts provide narrower intervals, as compared to novices, with midpoints closer to the true value. Expert/Independent and Expert/Non-Independent certification both provided an additional 8 boxes to the buyer (revealing to the buyer whether the blank/white boxes were blue or red) and thus, reducing the range of possible values for the asset. The expected value of the additional boxes was a total range reduction of $16 with $6 at the top end of the range (the risk is that the buyer will overpay and lose money so the focus is placed on the reduction of the range at the high end). Average/Independent and Average/Non-Independent certification both provided an additional 4 boxes for a

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[20] Participants were provided with some information about the value of the asset. Specifically, participants were told the range of possible values for the asset and this range information was adjusted if the buyer received Expert or Average auditor certification. The decision to provide range information resulted from two pilot sessions that were run with a total of 20 participants. The pilot sessions were run without providing the participants with range information about the value of the assets. During the pilot sessions it was noted that the participants spent excessive amounts of time on their calculators. The sessions were also very long (approaching 1.5 to 1.75 hours). After the sessions were finished, I elicited feedback from the participants. Participants overwhelmingly noted that they fatigued after approximately two rounds because the number of calculations required was tiring. They also told me that they often didn't even remember if their matched seller had provided a certification because they were so focused on calculating the possible asset values. I asked the participants to provide me with their scrap paper and noted that participants had calculated the maximum and minimum value for the assets. Therefore, it was decided that this information would be provided to participants for the live rounds. Providing this information is consistent with other studies that provide participants with a range of values for the assets (c.f. Cain et al. 2005; Koch & Schmidt, 2010). I also felt this information was necessary as I wanted to ensure participants were aware of the experimental manipulations as the amount of calculation time or cognitive effort to determine the asset value was not of interest in the study. It was also critical to reduce the length of the experiment to approximately 1 hour.

range reduction of $8 with $4 at the high end of the range. Expertise was also communicated through a statement about the auditor's status as an expert.

Participants were told the following with respect to Expert auditors:

> This auditor is an expert auditor who conducts a procedure on the value of the asset and because of his / her expert abilities, is able to reveal **8 additional colored boxes to the buyer**.

Average auditors came with the following statement:

> This auditor is an average auditor who conducts a procedure on the value of the asset and because of his / her average abilities, is able to reveal **4 additional colored boxes to the buyer**.

Independence

Independence was operationalized using a truth telling[21] auditor (Independent) versus an auditor who has potential bias towards the client (the seller) (Non-Independent). Independent certifications came with the following statement:

> *This auditor is independent and always reports the value of the asset objectively. This means that all blue squares are reported as blue squares and all red squares are reported as red squares*.

Non-Independent certifications came with the following statement:

> *This auditor is non-independent and does not always report the value of the asset objectively. This means that of the additional boxes that are revealed to the buyer, of*

[21] Schuetze (1994) defines independence as a public accountant who will tell the truth as he sees it and will permit no influence.

those that are the low value red boxes, there is a 25% probability that the auditor will disclose those boxes as the high value blue boxes.

As the color of the additional boxes was predetermined based on the total asset value, to operationalize the Non-Independent condition, a random draw was performed for any red additional boxes. Specifically, since there was a 25% probability that any additional red boxes would be displayed as blue boxes, a draw from three red boxes and one blue box was performed and if the draw resulted in a blue box, that box was displayed instead of the red box. This occurred for rounds 2 and 5 where one red box was displayed as blue.

Information Asymmetry

Information asymmetry was be manipulated by providing sellers and buyers with differential information about the asset value via the number of colored boxes displayed. In the Low Information Asymmetry conditions, sellers always saw 36/40 colored boxes, but buyers saw 28/40 colored boxes (any boxes not displayed were shown as white/ blank). Twenty-eight was chosen because in the case that a seller purchases Expert/ Independent certification, the buyer would also see 36/40 colored boxes and information asymmetry would be eliminated. Overall, in the Low Information Asymmetry condition, buyers could see 28, 32 or 36 colored boxes depending on the type of certification purchased by the seller.

In the High Information Asymmetry conditions, sellers always saw 36/40 boxes, but here, buyers only saw 20/40 boxes. Twenty was chosen because in the case that a seller purchases Expert/Independent certification, the buyer would see 28/40 boxes, which is consistent with the base level in the Low Information Asymmetry condition. Overall, in the High Information Asymmetry condition, buyers could see 20, 24 or 28

colored boxes depending on the type of certification purchased by the seller.

Note that under each scenario buyers were informed of the number of boxes the sellers saw and similarly sellers were told the number of boxes the buyers saw.

Incentives

Participants were provided with a show up fee of $10 and additional incentives were held constant across conditions in that the common goal was to make the most profit possible. Profits were calculated using dollars[22]. In each session there was an additional $100 available to split among all of the sellers and $100 to split among all of the buyers. Previous studies have found that in bilateral bargaining with high information asymmetry, sellers earn on average 96% more than buyers (Seale, Daniel & Rapoport, 2001). As I am more concerned with the relative distribution of profit rather than the absolute value earned by each type of player, I chose to have equal pools of payout available. Thus, because of the differential asset values, payment for certification and information asymmetries, sellers competed against other sellers and buyers competed against other buyers.

Seller and buyer profits for each round were calculated as follows:

Seller profit = [Sale price – (Amount paid for certification + True value of the asset)]

To give sellers the incentive to bid their true value for the auditor certifications, the bid for certifications was conducted as a second-price sealed-bid auction. This means that the amount paid for certification was the second highest bidder's price. If there was no second highest bidder (the winner gave the only bid) the sole bidder's price was used.

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[22] Dollars were used as experimental currency. This was done, instead of for example, using an experimental currency such as taler or franc, to elicit the most realistic value measurements possible. If participants felt as though they are giving up tangible dollars, the bids and pricing were likely more reflective of participants' actual beliefs about the value of independence and expertise.

Buyer profit = (True Value of the Asset – Purchase Price)

Total seller (buyer) payouts were calculated by first determining the total profits for all sellers (buyers) in one experimental session. Then, each individual seller's (buyer's) cumulative profits from each round (from the formula shown above) were calculated as a percentage of the total seller (buyer) profits for the session. This percentage was multiplied by $100 available to arrive at the final payout. If any participant ended up in a net loss position the total payout was calculated as zero. Actual payouts ranged from $0 to $77.

Feedback

After each round, participants were told their individual profit or loss. They did not receive profit/loss information for other participants. After round 3, participants received feedback with respect to the certifications purchased by the most profitable seller. For example, if the most profitable seller purchased Expert/Independent certification in the first round and None in the second and third rounds, participants would be told that "the most profitable seller has purchased the following types of certification: Expert/Independent, None, None. This feedback was only given after the third round and the same information was given to buyers and sellers.

IV. RESULTS

Participants

The participants consisted of 230 students and alumni[23] of a major Canadian public university representing non-professional or unsophisticated investors.[24]

[23] A total of 3 alumni participated in the study. The remaining 227 students were currently enrolled in university.

[24] A focus on non-professional investors' perceptions is reasonable and is impactful because these perceptions are considered crucial to capital markets' efficiency and effectiveness (SEC, 2001; Vickers and McNamee, 2002), especially with recent increases in the number of non-professional investors (Securities Industry Association, 2002; SEC, 2003).

Participants were recruited using the university's website. Students and alumni register to participate in research studies using this website and are notified via email about the availability of a new study. In addition to the website, the university's Research Participation Facebook page and an established email list from the university's paid marketing pool were used as recruiting tools. On average, participants were 23 years old and had attended university for 3.6 years. Seventeen percent of participants majored in accounting, 10 percent in finance, 10 percent in engineering, four percent MBAs and 59 percent in a wide variety of other majors.

Of the 230 participants, 110 participated in the low information asymmetry condition and 120 in the high information asymmetry condition. There were 115 buyers and 115 sellers.

Manipulation Checks

To ensure participants understood the experiment prior to starting, they responded to ten questions while reading the experiment instructions. During this time, the experimenter reminded participants to complete the questionnaire and stated that the questionnaire must be completed prior to starting the experiment. Also, while participants were reading the instructions the experimenter actively walked around and confirmed with each participant that they had completed the questionnaire and also answered any questions they had. After participants were finished reading the instructions, the experimenter verbally dictated the most important parts of the instructions to ensure complete understanding. During the sessions it was noted that 13 participants did not fully complete the questionnaire. The experimenter verbally

confirmed with these participants whether they had any questions. There was no indication that these participants did not understand the experiment and these participants are not outliers in the dataset.

To test whether the manipulation of the low versus high information asymmetry variable was successful, participants were asked whether they believed the buyers/sellers knew a lot less/more about the asset values then they did (on a scale of -3 to +3 anchored by strongly disagree and strongly agree). In the high information asymmetry condition, sellers agreed that the buyers knew a lot less than they did (mean=1.56) versus the low information asymmetry condition where sellers were close to neutral (mean=0.54, p=<0.001). With respect to buyers, those in the high information asymmetry condition also agreed that the sellers knew a lot more than they did about the asset values (mean=1.64) and buyers in the low information condition were close to neutral (mean=0.56, p=<0.001). These results indicate that the manipulation of information asymmetry was successful.

To assess whether participants had a base level of trust for auditors, participants were asked whether they generally trust auditors (on a scale of -3 to +3 anchored by strongly disagree and strongly agree). Overall, participants indicated that they somewhat trust auditors (mean = 0.95).

To assess overconfidence participants were asked, in each round, to assess the true value of the asset and to assess, on a scale of 0-100, how confident they were in their assessed value of the asset. Overconfidence was calculated consistent with Han, Jamal and Tan (2011) using the following equation:

$$OC = C/100 - A$$

Where C is the participant's confidence in his/her asset value estimate. The original 0-100 scale was divided by 100 and converted to a 0-1 scale. A is the participant's actual answer. A equals 1 if it is correct and 0 otherwise. OC>0 implies overconfidence and OC<0 implies underconfidence. The higher the value of OC, the more overconfident the participant is in his/her own knowledge.

I find that sellers and buyers are overconfident in their own knowledge (means = 0.64 and 0.55 respectively) and consistent with the information differential in the experiment, sellers are more overconfident than buyers ($t=2.269$, $p=0.024$). However, for both buyers and sellers there are no differences in overconfidence between low and high information asymmetry ($p>0.602$).

The data was also assessed for outliers. Outliers were analyzed using profit as the dependent variable and specifically any data points greater than 1.5 times the interquartile range (which contained 50% of all values) were individually investigated.[25] The 5% trimmed means were also assessed to determine if there were any large differences compared to the overall mean. In total, 37 (out of a 920) individual profit observations were identified as possible outliers. Of these 37 observations, 15 related to sellers who paid a significant amount for certification and thus, experienced lower profits. These 15 observations were not considered outliers. Of the remaining 22 observations, 16 observations related to buyers who in one round purchased their assets at a marginally

[25] Note that bids on certification were not used to analyze outliers as it was of interest as to how high or how low certification bids could go. For example, if one participant bid 500 on certification and one bid 0.01 and both were more than two standard deviations from the mean, it would not be appropriate to eliminate these from the dataset.

higher or lower price than the rest of the participants. None of these 17 buyers were identified as an outlier in more than one round and the outliers were evenly dispersed between rounds (six in each of rounds one and three and five in round two). Of the remaining 5 observations, one participant was identified as an outlier in rounds two and three. This participant indicated during the experiment that she had become confused between obtaining the highest and lowest selling price for rounds two and three and had earned negative profits. This participant and the matched seller were thus, eliminated for rounds two and three. Two additional participants wrote on their profit spreadsheets that they had made errors, which caused them to earn negative profits. One buyer accepted a purchase price of 420 and one seller accidentally entered 60 as a bid instead of 260 (the 60 bid was of course accepted by the buyer). These observations and their matched pairs were also removed from the dataset. In total, eight observations were removed from the experiment with two in round two (low information asymmetry condition) and six in round three (two in the high information asymmetry condition and four in the low information asymmetry condition).

During the experiment sessions it became obvious that participants behaved differently in round five than they did in the initial four rounds. Unsolicited post experimental participant comments also indicated that additional investigation into round five behavior was needed.[26] In the first three rounds, participants spent an average of 114 seconds negotiating, sent an average of 7 bids/asks and the buyer's initial bid was on

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[26] While receiving payment, participants made comments that indicated they behaved differently in round five than in other rounds. The most common comment was that they took more risks than they did in other rounds (e.g. "In the last round I didn't really care and just bid as low as possible"; "I completely ignored the certification and just tried to make up for losses I had incurred previously").

average $43 lower than the seller's initial ask. In round five, participants negotiated an average of 142 seconds, sent an average of 15 bids/asks and the buyer's initial bid was on average $75 lower than the seller's initial ask. In addition, in round five only 42 participants negotiated for 100 seconds or less; whereas, in the first three rounds, an average of 86 participants negotiated for 100 seconds or less. Overall, it does appear that behavior in round five was more risk seeking and since the experiment had a set endpoint with all rounds counted for payouts (compared to playing more rounds with an unknown endpoint or randomly selecting one of the five rounds for profit calculation) round five is not included in the results as presented.

Dependent Variables

Participants were asked for various dependent variables. The primary dependent variables of interest with respect to the hypotheses in this study were the amount paid for certification, the profit/loss and the settlement price for each transaction and the total market profits and allocation to buyers, sellers and auditors.

Test of hypotheses

To test the hypotheses I first conduct a mixed-effects model with profit as the dependent variable, Certification[27] and Information Asymmetry as the dependent variables, participant as a random effect, and round (1-3)[28] as a covariate. Table 1, Panel

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[27] For analysis purposes, Auditor Independence, Auditor Expertise and No Certification were combined to create one 5 level Certification variable.

[28] Rounds 1-3 are used in the primary mixed model analysis. This is because as noted in the method section, participants were given feedback after the 3rd round. This means that the 4th round differs from the first three rounds and is therefore, analyzed separately. In general, unless otherwise noted, all analysis refers to rounds 1-3.

A presents the descriptive statistics for seller's total average profits for rounds 1-3, while Panel B shows the mixed-model results. Table 3 Panel A presents the descriptive statistics for seller's total average profits for round 4.

With respect to H1a, I find that sellers significantly overvalue independence and expertise. Specifically, the mixed-model in Table 1, Panel B shows a significant main effect of Certification (p=0.000)[29]. Sellers who purchase certification are significantly less profitable than those who do not purchase certification. Sellers purchasing certification earned on average $7.35 in profits and sellers not purchasing certification earned on average $47.76 in profits. These results support H1a.

This difference in profitability is not simply driven by the initial choice to purchase certification (e.g. paying anything over $0 for certification). Buyers matched with sellers who purchased certification paid on average $6.85 more for their assets than did buyers matched with sellers who did not purchase certification. Specifically, when certification was present, buyers paid on average $204.77 for the assets and when certification was not present, buyers paid on average $197.42. In the mixed-model with settlement price as the dependent variable, this $6.85 difference is marginally significant (p=0.079) and there is no impact of information asymmetry (p=0.579) and no interaction between certification and information asymmetry (p=0.411). These results marginally support H1b.

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[29] The mixed-model in Table 1, Panel B includes a crude measure of Certification (1=yes, 0=no). This measure is used instead of the 4 level factor because although seller profits are lower in the Certification conditions as compared to the None conditions, none of the Certification conditions are significantly different from each other (p >0.778), but all are different from the None condition (p<0.000).

This means that it if sellers properly anticipated the buyers' certification value by paying less than or equal to $6.85 for certification, it was possible for these sellers to earn comparable profits to sellers who did not purchase certification. However, as seen in Table 2, Panel A, sellers bid between $48.68 and $67.19 and paid between $32.60 and $51.12 (Table 5 Panel A) for the various types of certification. This certification pricing is dramatically higher than the expected range reduction provided by the certification ($8-$16). This provides evidence that sellers are not using expected value to price certification and instead are likely relying on overconfidence and trust, which leads to significant overvaluation.

Finally, note that in Table 1, Panel B, there is there is no significant interaction between Certification and Information Asymmetry (p=0.456) and therefore, we observe that sellers exhibit general overvaluation of independence and expertise

With respect to buyer valuation of certification and in support of H1b, as stated above, in rounds 1-3 buyers paid on average $6.85 more for assets with certification than those without.

With respect to H1c, buyers were able to earn, on average, $4.19 more in profits when purchasing assets with certification (mean profit = $17.86) than when purchase assets without certification (mean profit = $13.67). However, this difference in profit is not significant. In support of H1c, using a mixed-model with profit as the dependent variable and information asymmetry and certification as independent variables, buyers purchasing assets with certification are no more profitable than those purchasing without

certification (p=0.459). This means that buyers are fairly well calibrated when it comes to estimating the expected value derived from certification.

Further evidence of buyers' appropriate calibration in spite of their overconfidence comes from comparing the additional $6.85 paid for certification to the expected range reduction from an auditor. As noted, the expected range at the top end of the range was between $4 and $6. By only paying on average, an additional $6.85 for assets with certification buyers only slightly overestimated the expected value of the auditor. This provides support for the fact that when estimating the value of certification, buyers rely more on expected value as compared to trust and overconfidence.

H2 predicts that because of seller overvaluation of independence and expertise, auditors will be the main beneficiaries of increased levels of independence and expertise. H2 is partially supported because there is a main effect of Information Asymmetry. As seen in Table 4, in Low Information Asymmetry sellers and auditors are equally profitable with sellers earning 42% of total market profits ($4,725.15) and auditors earning 38% of total market profits ($4,233.35). These amounts are not different (p=0.884). In High Information Asymmetry sellers earn a significantly smaller portion of total market profits than do the auditors. As per Table 4, sellers earn 19% of total market profits ($2,186.60) and auditors earn 51% ($5,731.40). This difference is significant (p<0.000).

Although sellers do pay auditors, on average, a higher amount for certification in High Information Asymmetry (mean of $46.60) the difference is not significant when compared to the average amount paid for certification in Low Information Asymmetry

($38.48, p=0.276[30]). Therefore, overvaluation of auditor independence and expertise is constant between low and high information asymmetry. However, we do observe a difference in the percentage of market profits captured in High and Low Information Asymmetry because buyers are able to capture a larger percentage of the profits in High IA Information Asymmetry. This is consistent with H3 below where we see that sellers are less profitable in High Information Asymmetry.

H3 predicts that overvaluation of auditor certification will reduce any benefit from certification in markets with high information asymmetry when compared with low information asymmetry. First, as per Table 1, Panel B, there is a main effect of Information Asymmetry (p=0.040) on seller's profits. Sellers are more profitable in Low IA where mean profits for rounds 1-3 were $29.17 compared to $12.22 in High Information Asymmetry. Consistent with this pattern of results, buyers exhibit a marginal amount of price protection in High Information Asymmetry where the average selling price is $197.67, which is lower than the average selling price in Low Information Asymmetry ($201.45, p=0.077). Further, as seen in Table 4, sellers capture a smaller portion of the total market profits in High Information Asymmetry ($2,186.60 or 19%) versus Low Information Asymmetry ($4,725.15 or 42%) and this difference is significant (p=0.014). Overall, sellers are less profitable in high information asymmetry markets than in low information asymmetry marks.

[30] The p-value here represents the p-value on the F-stat from the mixed-model with seller payments for certification as the dependent variable and information asymmetry and certification as the independent variables.

With respect to the impact of overvaluation on any additional benefit derived from certification in high information asymmetry markets, on average, sellers profit when purchasing certification in High Information Asymmetry were -$1.92 and in Low Information Asymmetry were $17.82. This difference is significant (t=2.203; p=0.029). In addition, in High Information Asymmetry average profit for those not purchasing certification was $43.27 and in Low Information Asymmetry was $52.51. The difference between the High Information Asymmetry profit amounts is significant (t=5.350; p<0.000) and similarly in Low Information Asymmetry (t=4.038; p<0.000). The effect size for both t-tests was calculated and in support of H3, the effect size in High Information Asymmetry is large (Cohen's d=0.81) and in Low Information Asymmetry is medium (Cohen's d=0.61) meaning that, consistent with H3, the reduction in profit in High Information Asymmetry for those purchasing certification is larger than the reduction in profit for those purchasing certification in Low Information Asymmetry.

H4 predicts that with respect to sellers, independence, as compared to expertise, will have more value in markets with high information asymmetry and expertise will have more value, as compared to independence, in markets with low information asymmetry. To investigate this hypothesis, the change in the amount paid for certification from before feedback (rounds 1-3) to after feedback (round 4) is used.[31]

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[31] Note that it is also possible to simply analyze the amount paid for certification in rounds 1-3 to determine if the value placed on the types of certification differs across conditions. This analysis was performed using a mixed-model with amount paid for certification as the dependent variable and certification and information asymmetry as the independent variables. None of the main effects or interaction effects are significant (p>0.290).

Feedback was coded using 0,1 coding where 0 represented rounds 1-3 where no feedback was present and 1 represented round 4 after feedback had been given.[32] To test the impact of feedback, certification and information asymmetry on the amount paid[33] for certification, I ran a mixed-model with participant as a random effect and round as a covariate. The results are reported in Table 5, Panel B. Primarily, there is a main effect of feedback ($p<0.000$) on the amount paid for certification. Specifically, before feedback, the average amount paid for certification was $42.78 and after feedback the average amount paid was $16.39. There is no main effect of certification ($p=0.573$) meaning that no specific type of certification differed in the difference in the amount paid before and after feedback. Similarly, there is no main effect of information asymmetry ($p=0.659$). Overall, this indicates that sellers attempted to revise their overvaluation across all types

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[32] Sensitivity analysis was performed on the feedback coding. The feedback given always contained 3 potential certifications purchased by the most profitable seller and these certifications could take any form (e.g. None, Expert/Independent, None or Average/Independent, Average/Independent, Average/Independent, etc.). Out of 23 experimental sessions, 14 different feedback combinations were given. The most frequent combination was None, None, None which was given 6/23 times. Out of the 23 feedbacks, 17 contained at least one None and only 6 contained zero Nones. Sensitivity analysis was performed using three alternative codings for the 1 in the 0,1 coding (and using a 0,1,2 coding instead): a) 2/3 non-None certifications and all other feedback; b) 1/3 non-None certifications and all other feedback; and c) 0/3 non-None certifications and all other feedback. The only impact on the reported results was that when using the 2/3 and 1/3 feedback coding the Information Asymmetry*Feedback interaction became marginal (0.087 and 0.09 respectively).

[33] Note that I also conducted the H4 analysis using the amounts bid for certification as the dependent variable (see Table 2 Panel A for descriptive information). I do not find any effect of certification, information asymmetry or feedback on the amounts bid. I believe that the primary reason for this is that I did not place any rules on the amounts bid for certification, which means that participants could, for example, bid only $0.01 different for two types of certification. After investigating the specific bids I find that most participants bid on all four types of certification and did not use a wide range for their bids. This created a lack of variance in the individual bids. In addition, it isn't clear that participants who only separated their bids for the four types of certification by $1 valued the types of certification differently than a participant who separated each bid by $10. Overall, although the absolute dollar amount of the bids is reflective of participants' true value for the certifications, this may not be true for the differences between the bids. Therefore, amounts paid for certification are used in the H4 analysis.

of certification subsequent to receiving feedback. This is consistent with expectations based on the results of H1a.

The significant interaction between feedback and information asymmetry ($p=0.027$) stems from the fact that the decline in the amount paid for certification is larger in High Information Asymmetry than it is in Low Information Asymmetry. In High Information Asymmetry the average amount paid for certification before feedback was $46.59 and after feedback was $10.91 for a difference of $35.68. The t-test for this difference is significant ($p<0.000$). In Low Information Asymmetry the average amount paid for certification before feedback was $38.49 and after feedback was $22.23 for a difference of $16.26. This difference is also significant at $p=0.029$. Overall, participants revise downwards the amount paid for certification, but the decrease is larger in High Information Asymmetry indicating that sellers overvalued certification more in High Information Asymmetry than in Low Information Asymmetry prior to feedback. This consistent with the findings discussed under H3 and also supports H5 where it was predicted that sellers would decrease the amount paid for certification after feedback.

As seen in Table 5, Panel B, the 3-way interaction is insignificant ($p=0.639$). However, based on the change tables in Table 5, Panel A, we would expect to see some significant differences in the declines in the amount paid for certain certifications after feedback. Accordingly, since there is no main effect of certification on the amount paid before and after feedback, an alternative way to investigate these changes is to recode the certification variable. This can be done by collapsing Expertise across types of Independence and collapsing Independence across types of Expertise. This would result

in two certification variables both with two levels: Expert/Average or Independent/Non-Independent. The results of the mixed-model are reported in Table 5, Panel C and are the same as those reported in Table 5, Panel B except for the significant 3-way interaction between Feedback, Certification Independence and Information Asymmetry (p=0.035).

The 3-way interaction is significant because as seen in Table 5, Panel A, in Low Information Asymmetry the decrease in the amount paid for Independent Certification (-$51.32) is much larger than the decrease in the amount paid for Non-Independent Certification (-$9.64). In addition, the decrease in the amount paid for Independent Certification (-$51.32) is almost double that of the decrease in the amount paid for Expert Certification (-$27.07). Finally, the decline in Non-Independent Certification is by far the lowest decline across all conditions ($-9.64). This provides evidence that after feedback is provided in Low Information Asymmetry the revision to the amount paid for Independent Certification is the highest and the revision to Non-Independent Certification is the lowest and therefore, independence is less valued than expertise consistent with H4.

Conversely, in High Information Asymmetry there are no differences in the declines for Independent vs. Non-Independent Certification (-$66.01 and -$74.66 respectively) or for Expert vs. Average Certification (-$69.92 and -$70.75 respectively). I do not find support for differential valuation of expertise and independence in High Information Asymmetry. Consistent with the previous discussions, participants overvalue all types of certification in High Information Asymmetry.

H5 predicts that feedback will not fully eliminate seller overvaluation of certification. Here, I find that sellers purchasing certification earn on average $6.87 in

profits and sellers not purchasing certification earn on average $20.84 for a difference of $13.97. The results of a linear regression with profit as the dependent variable and information asymmetry and certification (none, all other certification types) as independent variables indicate that the impact of certification versus no certification on profit is significant (p=0.004). There is no impact of information asymmetry (p=0.220) and no interaction effect (p=0.193). These results support the fact that sellers continue to overvalue certification after feedback.

Finally, H6 predicts that after feedback, buyers will pay the same price for assets sold with and without certification. Consistent with this prediction I find that buyers pay on average $192.69 for assets without certification and $194.72 for assets with certification. This difference of $2.03 is not significant (t=0.413; p=0.621). This is in contrast to the marginally significant difference between the two purchase prices for rounds 1-3 discussed under H1.

Additional Analysis

Certification Bid ranking

Although no significant differences were found for seller certification bids, one thing to note is that the sellers' bid ranking exhibited a consistent pattern that may be reflective of value. In High Information Asymmetry, out of 157 first place certification bids[34], Expert/Independent was ranked first 39% of the time. The next highest first place bid was Expert/Non-Independent Certification at 28% of first place bids. This pattern is consistent in Low Information Asymmetry where Expert/Independent also received 39%

[34] Sellers were allowed to bid on all, some or none of the auditor certifications. If the sellers chose to bid on multiple types of certification, the bids had to differ by at least $0.01. Therefore, a first place bid means that the certification received the highest bid out of all of the seller's four possible bids.

of the first place bids and Expert/Non-Independent 30% of the first place bids. Interestingly, in High Information Asymmetry, the most highly ranked type of certification for second and third place was Average/Independent indicating that sellers preferred to stick with independent certification as they ranked their bids instead of staying with the expert certifier. Conversely, in Low Information Asymmetry sellers deferred to Average/Non-Independent for their most frequent second and third placed bids indicating that independence isn't as important in Low Information Asymmetry. These bid rankings are consistent with the H4 prediction that sellers will value independence more in high information asymmetry as compared to low information asymmetry.

Rational for purchasing and pricing certification

In the post experimental questionnaire participants were asked certain questions to elicit the reasons behind purchasing certification (all scales anchored by -3 (strongly disagree) and 3 (strongly agree)). One of these questions asked sellers whether they thought purchasing certification positively influenced the buyers' trust in them. Sellers purchasing certification on average agreed with this statement more than sellers not purchasing certification. Specifically, sellers purchasing certification somewhat agreed that the certification positively influenced buyer trust (mean=0.96) and sellers who did not purchase certification were closer to neutral (mean=0.17; p=0.04). Sellers purchasing certification also somewhat agreed that gaining the buyers' trust was important (mean=1.19) while sellers not purchasing certification were closer to neutral (mean=0.49; p=0.03). This provides additional support for the fact that sellers purchased certification to elicit trust.

Further, in an open-ended question, sellers were asked to describe the process they used to decide how much to bid for auditor certification. Overall, 47% of sellers indicated that the trust and considering the buyers' value for certification were the key factors in pricing certification. On the other hand, 35% of sellers noted that they considered their personal profit as the primary factor used when pricing certification. The remaining 18% of sellers either didn't respond to the question or didn't mention trust, the buyer or profit.[35]

Finally, when directly asked whether auditor independence was more important than auditor expertise, participants only somewhat agreed (mean=0.94). This indicates that independence is perhaps not as primary as the regulators currently believe.

V. CONCLUSION

This study investigates, in a negotiation setting with varying levels of information asymmetry, the value of auditor independence and expertise. The results show that sellers pervasively overvalue independence and expertise and that this overvaluation has a negative impact on their profits. In markets with high information asymmetry, which is the type of market where regulation is intended to have the most benefit, seller overvaluation is more extensive and as a result, the largest percentage of market profits are allocated to the auditor. This finding is consistent with Capture Theory where audit regulators are perhaps captured by the auditors and therefore, the auditors see the most benefit from independence regulation. I also find that feedback can only partially correct seller overvaluation of independence and expertise.

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[35] There was also no common theme to these responses.

Buyers are better calibrated than sellers when it comes to pricing auditor certification. In this setting, sellers must interpret the potential value of certification to the buyer; whereas, buyers are simply tasked with determining their own certification valuation using expected value. I find that buyers value certification very close to the expected value, but sellers drastically overvalue certification compared to the expected value. There is evidence that sellers rely more heavily on generating the buyer's trust as compared to expected value.

In this setting, neither sellers nor buyers benefit extensively from increased levels of expertise and independence. The results also do not support audit regulators' continual emphasis on auditor independence above any other feature of the audit environment. There is no clear evidence that investors value independence over expertise and instead, there is evidence that in markets with low information asymmetry, sellers value expertise over independence.

The findings have implications for regulators and raise questions about the effectiveness of emphasizing independence over expertise in all markets. Instead of benefiting investors by helping them achieve more profit from transactions, the auditor tends to benefit and captures the majority of market profits.

Limitations

The limitations of this study are similar to most experiments. The market setting is simplified to isolate the factors I believe are most important and it somewhat abstracts away from mundane realism (Swieringa and Weick, 1982). It is possible that in a richer setting, other variables not included in the study could impact outcomes. For example,

auditors are automated in my setting and if auditors were instead participants in the experiment litigation, reputation concerns could affect the range estimates reported to investors. In addition, the auditors do not incur a cost to perform the audit procedure, so auditor profits are reported at their gross amounts. Also, I do not directly compare the theories of regulation posited to influence decisions.

Participants were not endowed with any start up funds and were therefore free to spend as much money as they wanted on the certification and on the asset. As a result the variances in certification bids, amounts paid for certification and investor profits are quite high. A reduction in this variance may strengthen results as presented.

The sample size for profit and certification payments subsequent to feedback is small compared to the sample size for these measures prior to feedback (three rounds versus one round). The results may be strengthened by running more periods subsequent to feedback or by changing the incentive structure used in the experiment. For example, one round could have randomly been chosen for payout instead of using all five rounds. This may have reduced the incentive to engage in risk seeking behavior in round 5 and then this round could have been used in the subsequent feedback sample.

The measure of overconfidence used in the study does not directly measure overconfidence in the auditor certification. Instead, it uses overconfidence in one's own knowledge of the asset value and the extent of auditor trust as proxies for general overconfidence. A more direct measure of overconfidence may elicit a more direct test of the paper's theory, but it also may have made participants overly aware of their overconfidence and thus, influenced decisions made with respect to certification.

Future Research

This study is part of a program of research that seeks to determine which features of the financial reporting environment provide the most benefit to investors and under which market conditions these benefits are realized. Future research will examine whether professional accountants' clients are perhaps better off when the accountant can deviate from independence, whether individuals' value from independence is primarily attached to its public signal or whether individuals derive private value from independence.

TABLE 1

Effects of Certification and Information Asymmetry on Sellers' Profits (Rounds 1-3)

PANEL A: Mean (Standard Deviation)

	Low IA	High IA
Expert/Independent	$22.18	-$8.09
	($54.23)	($69.64)
	n = 29	n = 33
Expert/Non-Independent	$19.58	$0.06
	($81.70)	($60.24)
	n = 29	n = 33
Average/Independent	$7.96	$7.44
	($69.05)	($61.63)
	n = 26	n = 27
Average/Non-Independent	$20.96	-$6.34
	($72.53)	($77.63)
	n = 25	n = 30
None	**$**52.51	$43.27
	($39.74)	($41.95)
	n = 53	n = 56

PANEL B: Mixed-Effects Model

	df	F-stat	p-value
Certification	1	32.279	0.000***
Information Asymmetry	1	4.233	0.040**
Certification x Information Asymmetry	1	3.135	0.456

** significant at the 5% level
*** significant at the 1% level

TABLE 2

Descriptive Statistics: Seller Bids by Certification (Rounds 1-3)

Panel A: Mean (Standard Deviation)

LOW Information Asymmetry				
	Expert / Independent	**Expert / Non Independent**	**Average / Independent**	**Average / Non Independent**
Certification Bids	55.97 (69.04) N=98	46.68 (65.21) N=102	55.25 (70.19) N=98	50.21 (71.41) N=96

HIGH Information Asymmetry				
	Expert / Independent	**Expert / Non Independent**	**Average / Independent**	**Average / Non Independent**
Certification Bids	60.87 (74.86) N=107	67.19 (87.15) N=102	54.96 (72.43) N=106	67.19 (90.25) N=97

TABLE 3

Descriptive Statistics: Seller Profits by Certification and Information Asymmetry (Round 4)

PANEL A: Mean (Standard Deviation)

	Low IA	High IA
Expert/Independent	$10.50	$13.89
	($14.74)	($8.17)
	n = 8	n = 7
Expert/Non-Independent	-$9.03	$12.68
	($49.28)	($33.53)
	n = 9	n = 10
Average/Independent	$0.86	$10.71
	($31.66)	($30.49)
	n = 7	n = 7
Average/Non-Independent	$0.33	$13.67
	($24.01)	($19.31)
	n = 6	n = 9
None	$21.04	$20.67
	($24.45)	($17.85)
	n = 23	n = 27

TABLE 4

Descriptive Statistics: Profits by Experimental Role (Rounds 1-3)

Panel A: Total Profits (Percentage of total market profits)

	Seller Profits	Buyer Profits	Auditor Profits	Total Market Profits
Low IA	4,725.15 (42%)	2,266.00 (20%)	4,233.35 (38%)	11,224.50
High IA	2,186.60 (19%)	3,366.00 (30%)	5,731.40 (51%)	11,284.00

TABLE 5

Effect of Feedback on Amount Paid for Certification under High and Low Information Asymmetry and by Certification type

PANEL A: Mean (Standard Deviation)

Low Information Asymmetry Before Feedback	**Expert Certification**	**Average Certification**
Independent Certification	33.86 (47.26) n=30	43.65 (57.73) n=26
Not Independent Certification	39.57 (54.80) n=29	32.60 (58.61) n=25

Low Information Asymmetry After Feedback	**Expert Certification**	**Average Certification**
Independent Certification	8.33 (7.07) n=9	17.86 (18.42) n=7
Not Independent Certification	38.03 (40.89) n=9	24.50 (29.15) n=6

Difference between Before and After Feedback	**Expert Certification**	**Average Certification**	**Total Change**
Independent Certification	-25.53	-25.79	-51.32
Not Independent Certification	-1.54	-8.10	-9.64
Total Change	-27.07	-33.89	

High Information Asymmetry Before Feedback	**Expert Certification**	**Average Certification**
Independent Certification	51.12 (56.69) N=33	43.29 (53.46) N=27
Not Independent Certification	46.68 (50.26) N=33	44.71 (56.54) N=30

High Information Asymmetry After Feedback	**Expert Certification**	**Average Certification**
Independent Certification	17.26 (17.36) N=7	11.14 (10.58) N=11
Not Independent Certification	10.62 (8.77) N=10	6.11 (6.75) N=9

Difference between Before and After Feedback	**Expert**	**Average**	**Total Change**
Independent	-33.86	-32.15	-66.01
Not Independent	-36.06	-38.60	-74.66
Total Change	-69.92	-70.75	

PANEL B: Mixed-Effects Model

	df	**F-stat**	**p-value**
Certification	3	0.667	0.573
Information Asymmetry	1	0.195	0.659
Feedback	1	35.64	0.000***
Information Asymmetry x Certification	3	1.739	0.159
Feedback x Information Asymmetry	1	4.962	0.027**
Feedback x Certification	3	0.300	0.825
Feedback x Certification x Information Asymmetry	3	0.564	0.639

Panel C: Mixed-Effects Model with variation on Expertise and Independence

	df	**F-stat**	**p-value**
Certification Expertise	1	0.463	0.497
Certification Independence	1	0.528	
0.468			
Information Asymmetry	1	0.170	0.681
Feedback	1	34.44	0.000***
Feedback x Information Asymmetry	1	4.674	0.031**
Feedback x Certification Expertise	1	0.008	0.928
Feedback x Certification Independence	1	0.842	0.360
Feedback x Certification Expertise x Information Asymmetry	2	0.112	0.894
Feedback x Certification Independence x Information Asymmetry	2	3.464	0.035**

** significant at the 5% level
*** significant at the 1% level

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APPENDIX A – EXPERIMENT DETAILS

Appendix A outlines the sequence for the experiment. The experiment was programmed using Java Software.

After participants were randomly assigned the roles of buyers or sellers, they read five pages of experiment instructions including a flow chart detailing the order of the experiment. Participants were also given a practice asset for which they were told to calculate the value. Participants were provided private feedback on the exact value of the asset. After reading the instructions, participants answered ten questions on the details of the experiment. Once all participants had finished answering the questions, the experimenter read aloud some of the important details of the instructions and answered any remaining questions. All participants started the experiment at the same time.

All Conditions

1. Screen 1: Participants were shown the red, blue and blank square array including range information on the left side of the screen. On the right side of the screen, participants were asked to estimate the value of the asset and to provide their confidence in that asset estimate.

2. Screen 2: Sellers were asked to bid on the 4 different types of auditor certification[36]. The order in which the certifications were displayed was randomized over the 5 rounds. During this time, buyers waited for the sellers to submit their bids and saw a screen reminding them of the 4 different types of certification.

3. Screen 3: Sellers were informed of the certification they had won (if any). Buyers were informed of the certification won by their matched seller. Sellers were told

[36] Note that the certifier is not a player in the experiment.

how much they paid for certification, but were not given any additional information about other seller's bidding behavior. Buyers are not told how much sellers paid for certification.

4. Screen 4: If applicable, buyers were shown new asset arrays with any additional boxes added to the bottom of the array and were also given updated range information. Participants were given time to digest the results of the certification round and when they were ready pressed "next" to move on to the asset negotiation phase.

5. Screen 5: Buyers entered their initial offer to the sellers.

6. Screen 6: Sellers either accepted the initial offer or transmitted a counter offer to the buyer. Sellers and buyers continued to negotiate until a deal was made or time was up. The total time given for each of the five rounds was 3 minutes.

7. Screen 7: Once a deal was reached or time was up, the profit/loss was displayed. Participants were reminded of the selling/purchase price for the asset and were told their profit or loss. Participants wrote this amount on a profit tracking sheet.

The above process was repeated for 5 rounds.