Reputation, Liability, and Audit Quality:
What Incentivizes Auditors and their Clients?

February 2021 Version

Corresponding Author: Marcel Steller
University of Innsbruck, Austria
Marcel.Steller@uibk.ac.at

and

Erich Pummerer
University of Innsbruck, Austria
Erich.Pummerer@uibk.ac.at

ABSTRACT

In this study, we examine the effect of auditors’ reputation on the decisions they make about the investment of effort in audit processes and client interactions. We contribute to the theoretical audit literature by investigating reputational effects in a multi-period context. The results show that, in contrast to single-period models, audit fees affect the efforts of auditors, whereby a higher fee results in a higher audit quality. From an auditor’s perspective, there is an incentive to build and maintain a credible reputation if this results in economic advantages. Consequently, even without credibility, initial audit quality will not necessarily be impaired if the potential incentives arising from subsequent periods are strong enough. In the case of auditors with existing credibility, clients can leverage the required individual level of audit effort and quality in their favor through the audit fee. The combination of supply and demand results in an equilibrium quality of audit services, and the endogenous determination of reputation. The clients’ willingness to pay depends on the amount of their anticipated damages, subject to reduction by the auditor. Furthermore, our results reveal that incentivization effects on audit quality also depend on the liability regime. In the absence of legal liability, incentives driving audit quality arise solely from reputation. The establishment of legal liability and the definition of a liability cap requires a different assessment. The existence of reputation depends on the amount of the liability cap and on the clients’ demand for audit quality. Where expected damages for investors are high, auditor’s liability may be advantageous for clients.

Keywords: audit quality; auditors’ liability, reputation, multi-period model
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1. Introduction

The recent developments involving the German company Wirecard\footnote{Due to doubts about the existence of reported assets, a market value of EUR 10 billion was destroyed within a very short time. Lawsuits have also been filed against the auditors. In addition, as consequence of the “Wirecard affair” EY has already lost two prominent clients (in 2020, e.g. Commerzbank) and is at disposition by other clients, indicating a reputational damage for EY.} illustrate the importance of credible and accurate financial reporting, the absence of which created uncertainties and doubts that led, among other things, to considerable damage for some investors and stakeholders. The purpose of auditing is to prevent the occurrence of such situations and to contribute to the effective functioning of capital markets by enhancing the credibility of financial information. In this context audit quality is the joint probability that an auditor will detect and report on a material misrepresentation in financial statements (DeAngelo 1981b). Thus, regulators value high quality audits because the probability of an undetected material error decreases with increasing quality. Although audit quality depends on many factors, there is widespread agreement that the level of care exercised by auditors (the audit effort) significantly affects audit quality (Caramanis and Lennox 2008). Two prominent environmental factors affect the level of care exercised during audits: The legal system defined by the regulations; and the reputation of the (individual) auditor or the audit firm respectively (DeFond and Zhang 2014; Habib, Jiang, Bhuiyan, and Islam 2014; Hillegeist 1999). Whereas regulators and standard setters define consequences arising from legal liability, the building and maintenance of reputation resides in the realm of the (individual) auditor and is dependent on the market situation.

By regulating the audit environment, standard setters aim to set incentives for auditors to apply high levels of care. Consequently, the definition of the liability regime is an essential
measure. Although, the liability facing auditors is considered a fundamental driver of audit quality, liability systems vary considerably around the world despite standardization efforts, including within the European Union (Samsonova-Taddei and Humphrey 2015; European Commission 2008; London Economics and Ewert 2006). The differences in liability regimes result in various incentives for auditors to exert due care (London Economics and Ewert 2006). Despite the issue of auditor’s liability receiving attention in the extant analytical audit research (e.g., Bigus 2015; Laux and Newman 2010; Ewert, Feess, and Nell 2000; Hillegeist 1999; Schwartz 1997; Dye 1993), no superior liability regime has been identified. Nevertheless, in 2008, the European Commission recommended that member states limit auditors’ liability to increase competition in the audit market and improve or facilitate the insurability of audit-related liability claims (Philipsen 2014; European Commission 2008). In the context of Wirecard the low incentives from auditor’s potential legal liability in Germany are also discussed. German regulators (the BMF (2020) (Federal Ministry of Finance) raised a proposal (FISG) to increase auditors’ legal liability. The comment letters on this draft, show (extremely) different positions. In some comment letters (mainly audit firms and insurance companies) the suggested increase in liability is refused. Others, in contrast, express support for the increase in auditor’s liability or even provide suggestions to significantly increase liability above the suggested level in the governmental proposal.

Impaired consequences due to reduced incentives arising from legal liability, as defined by the legal liability system, enhances the importance of understanding the impact of reputation on audit effort. Significantly, damage to reputation is not insurable. When investigating incentives driving audit efforts based on reputation, the characteristics describing the reputation should be considered. In general, reputation is only valuable in markets, or for goods, where there is uncertainty about quality. Thus reputation consists of the transfer of the (positive) behavior in the past, or past events, to the future (Shapiro 1983). Accordingly, auditing is a
credence good because its quality is (especially ex ante) not observable. Ex post, material failures in audited financial statements might indicate audits of insufficient quality (Moizer 1997). Consequently, failures can be interpreted as signaling low audit quality and, conversely, audit firms that have not experienced past audit failures enjoy a stronger reputation.\textsuperscript{2} The non-occurrence of audit failures justifies trust in the audit quality delivered by the auditor. Hence, trust in the auditor’s abilities (quality) is a crucial part of the auditor’s business model.\textsuperscript{3} From an economic standpoint, credibility is the basis by which auditors participate in the audit market and gain access to profitable clients; thus, an auditor with a positive reputation can attract clients of superior quality. As trust\textsuperscript{4} is not naturally given but is earned over time, reputation requires time to build. Nevertheless, it is only worthwhile building and maintaining a positive reputation if this is related to potential advantages. The loss of reputation by contrast, can occur quickly, as the collapse of the Arthur Anderson network demonstrates (Chaney and Philipich 2002). Thereby, the loss of credibility can affect the whole audit company (i.e. loss of clients as shown by Weber, Willenborg and Zhang (2008) and reputational damages can be significant and exceed those resulting from legal compensation payments (Bergner, Marquardt and Mohapatra 2020; Karpoff, Lee and Martin 2008). The potential loss of reputation and the related possibilities to earn future fees creates incentives for the auditor to deliver high quality services (i.e., Bergner et al. 2020; DeFond and Zhang 2014).

The objective of this study is to investigate the relationship between reputation and audit effort, by considering the effects of (limited) liability and in the context of the supply and the demand-side of auditing.

\textsuperscript{2} Empirical evidence shows that clients more visible in the capital marked prefer reputational auditors (i.e., Barton 2005).

\textsuperscript{3} This argument is also supported by the statement “Auditing is a business about reputation” from the former chairman of the Public Company Accounting Oversight Board, James R. Doty (Public Company Accounting Oversight Board 2015).

\textsuperscript{4} In the following we use “reputation” and “trust” synonymously.
Hence, this study follows those dealing with the impact of incentives on audit effort. Compared to the effects created by legal liability (litigation risk), the incentives streaming from reputation (risk of reputation loss) attracted less attention in the extant (analytical) research (i.e., DeFond and Zhang 2014; Habib et al. 2014; Hillegeist 1999). A summary of the results of previous studies reveals that everything that is put at risk when accepting an audit mandate creates incentives for auditors to apply effort to their audits. The existing models analyzing reputational effects mostly reveal the positive impact of reputation on the auditors’ level of care. Some studies, focusing on incentives arising from auditors’ liability, only (implicitly) considered reputation as an exogenous feature of an auditor (i.e. auditor's wealth; Dye 1993; DeAngelo 1981b) or model reputation exogenously as reputational capital. The exogenous definition of reputation, however, fails to explain its emergence. Other studies consider reputation only as a manager’s perception of an auditor’s abilities, focusing on the effects of reputational incentives on audit quality, while neglecting the effects of liability-induced incentives (Corona and Randhawa 2010; Datar and Alles 1999). Others investigate the effects of both the incentives arising from legal liability and from reputation on an auditor’s level of care (Rothenberg 2019; i.e. Bigus 2011; Bigus 2015). According to Bigus (2011), a moderate liability system, in the form of limited liability, can prevent the auditor from exercising excessive care if there are sufficient reputational effects. Rothenberg (2019) analyses the effects of reputation in the context of a standard setting and highlights how reputational effects can dampen differences in the preferences regarding the strictness of standards between investors and auditors.

The extant research, however, mostly examines the effects of incentives arising from reputation in single period models and there is call for research to extend these investigation to a multi-period context to reflect important characteristics more appropriately (Rothenberg 2019; i.e.,

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5 Bigus (2011) refers to reputation as future rents from auditing but considers reputation as an exogenous factor and does not model a multi-period scenario.
Bigus 2011). Specifically, the effects of possible reputational losses, which can only affect subsequent periods, are not considered appropriately in these models. Building and maintaining a positive reputation is pertinent only in a multi-period context (Datar and Alles 1999). The standard single-period models to determine the optimal level of care assume that all effects occur in the period under consideration and neglect the potential effects arising from future periods. These models fail to reflect important characteristics of reputation. In the event of a loss of reputation, this will affect the ability of an auditor to generate income from auditing. Thus, we identify a research gap in the investigation of reputational effects in a multi-period context. Consequently, we develop a multi-period model based on DeAngelo (1981a) and Elitzur and Falk (1996). These reference models, however, do not focus on reputation. DeAngelo (1981a) set up a multi-period model with infinite duration to investigate the effects on audit fees (low balling) but does not focus on decisions governing audit effort. In contrast to DeAngelo (1981a), we do not assume constant audit quality (constant audit effort) or start-up costs for an initial audit. Elitzur and Falk (1996) investigate the relationship between audit fee and (planned) audit effort based on a multi-period model assuming that an auditor can only audit a specific client for a limited duration. We deviate from this assumption by assuming an infinite time span because we argue that, if no audit failure occurs, their reputation will be maintained which enables them to obtain other attractive clients. This assumption is reasonable in the context of audit firms but also in case of individual (auditors) partner that could sell their shares on audit firms at any time (e.g. retirement). Moreover, reputation is usually not client-related (and is therefore lost at the end of an auditor’s rotation period), but is attributable to an audit firm or the individual auditor. However, the occurrence of audit failures however threatens reputation.
In addition, we expand the perspective in two ways: first, by considering the demand-side of auditing (the investors’ perspective)⁶ and deriving an equilibrium audit quality and equilibrium fee, we endogenize reputation; and second, we differentiate between the liability-induced and reputation-induced incentivization of audit efforts.

We explicitly do not use a game-theoretical model (unlike, for example, Bigus (2011) Rothenberg (2019), because the question of which factors influence the decision on audit effort is not a strategic question, but a trade-off between of costs and benefits.

In our model, the auditor must deal with the risk of a reputation loss (and impaired consequences to generate income with auditing), and depending on existence with risk of legal liability when deciding about audit effort. Against the background of the risk suffering a loss due to incorrect accounting, the investor (audited entity) has to decide about the required audit quality to reduce the risk of damage, and the willingness to pay for the audit. In the light of these two different perspectives (decision situations), we examine the relationship between legal liability and reputation.

Thereby we focus on the limited liability regime⁷ in a multi-period setting, comparing scenarios with and without auditor’s liability. Then, we discuss the effects of an increase in legal liability from auditor’s and client’s perspective. In our multi-period-model, audit reputation represents trust in a high quality audit, as a credence good based on positive prior experiences, and is the basis of the auditors’ business model. The idea of our model is that auditors can participate in the market (providing audit services) until a failure damages confidence in the quality of an auditor and trust in the auditor’s quality is no longer justified. Additionally, as a reputation needs time to build, our model distinguishes between the

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⁶ In the following we use “investors” and “clients” synonymously. We are aware that investors are a heterogeneous group and focus on the perspective on those who contract with the auditor and pay the audit fee.

⁷ Later, we discuss the implementation of legal liability; the effects of liability however do not depend on the origination from statutory liability limitations or from an auditor’s limited wealth.
reputation-building and the reputation maintenance phases. Based on this model we formulate
the following research questions:

1) What are the effects on an auditor’s effort decision in single periods when these are
not separable (and the decision in a period affects subsequent periods) while
considering differences with regard to the auditor’s liability?

2) What effects are attributable to the development of reputation?

3) How do these two prerequisite factors affect optimal behavior from the demand-
perspective (client perspective) of auditing?

4) How is the relationship between reputation and legal liability in the context of supply
and demand of audit quality (audit effort)?

By answering these questions, we contribute to the body of analytical literature by
indicating how levels of care are affected in multi-period models by other factors, compared to
single-period models, and highlight the importance of reputation as a quality dependent on
incentives stemming from legal liability. We show conditions when legal liability of the auditor
is advantageous from the perspective of the audited clients.

The results are of interest for regulators who aim to incentivize high audit quality by
defining legal liability and for those who negotiate auditing fees.

We proceed as follows. Section 2 contains the model, Section 3 analyses the model and
presents the results: Section 3.1 refers to situation when reputation is maintained, Section 3.2
discusses the phase where reputation is built up, and Section 3.3 deal with the equilibrium audit
quality. Section 4 concludes.
2. Model

Consider an unaudited financial statement that contains a failure with probability \( r \), with \((0 < r \leq 1)\) that damages trust in the auditor’s quality (and therefore the auditor’s reputation). Additionally, if the failure occurs, the audited entity suffers damage. Hence, the auditor is required to audit the financial statements to detect and prevent the occurrence of any damage causing failure for the client while avoiding incurring a loss of credibility. For the audit service in the period \( T \) the auditor receives a non-contingent audit fee, \( f_r \) in advance. The risk-neutral auditor can accept or reject the engagement in every period. If failure occurs, trust in the auditor’s quality is lost along with the ability to generate income through auditing services. Principally the loss of reputation can be exempt from consequences that may arise from the legal liability regime (e.g. compensation payments), however we do not distinguish between a reputation-causing and a liability-causing error. Therefore, in this context, the occurrence of a reputation damaging failure is, in the scenario with legal liability, also related to a liability payment with the amount of \( L \). Thereby we focus on limited legal liability for auditor’s. To detect the (reputation loss and liability causing) failure, the auditor uses audit technology and always reports detected errors. Regarding the audit technology, we follow the literature and assume a technology with diminishing marginal productivity of audit effort (e.g., Bigus 2011; Patterson and Wright 2003; Elitzur and Falk 1996). Using audit technology affects the detection probability of a failure which depends on the auditor’s effort, \( \lambda \), represented as:

\[
p(\lambda) = \frac{1}{1 + \lambda} \quad \text{with} \quad \lambda \geq 0; 0 \leq p \leq 1, p(\lambda = 0) = 1, \frac{\partial p(\lambda)}{\partial \lambda} < 0, \frac{\partial^2 p(\lambda)}{\partial \lambda^2} > 0 \quad \text{and} \quad p \to 0, \text{if} \quad \lambda \to \infty. \tag{1}
\]
The post-audit probability of reputation-damaging failure is: \( p_d(\lambda) = r_p(\lambda) \). Performing the audit incurs direct audit costs. For simplicity, we assume that audit costs linearly increase with audit effort at a constant variable cost of \( c\lambda \).

2.1 Auditor’s decision situation single-period-setting

In single-period standard models, the auditor’s expected profit \( P^L(\lambda) \) is the difference between the audit fee for the period under consideration \( f \) and the audit related costs (which compose of the direct audit costs depending on the period-specific level of care \( \lambda \) and the expected liability cost post audit):

\[
P^L(\lambda) = f - c\lambda - L p_d(\lambda)
\]

In the absence of legal liability \((L=0)\), the term simplifies to \( P(\lambda) = f - c\lambda \).

From the auditor’s perspective, the profits generated by auditing express the benefits of providing audit services in future periods. Considering that the occurrence of a failure and that the subsequent loss of trust affects future profits, we widen the perspective to a multi-period horizon. Especially in the context of reputation it is to expect that damages on reputation will affect future periods.

2.2 Auditor’s decision situation multi-period-model

In the multi-period context \( P^T_r(\lambda_r) \) indicates the expected profit, \( f_r \) the fee and \( \lambda_r \) the audit effort for period \( T \). Because reputation evolves over time, we distinguish between two phases when modelling the multi-period horizon. The reputation-building phase is characterized by an information structure that is absent during the phase where there is an existing reputation. If reputation is successfully built, the auditor has to decide in subsequent periods about the maintenance of their reputation (described as the maintenance phase). Upholding trust increases
the probability of building or maintaining a positive reputation. We consider two periods to analyze the building of reputation because two periods are necessary to reflect an information structure and thus are the shortest duration required to analyze the building of trust. The enlargement to a longer time span provides no further insights in the factors affecting the building of reputation. Therefore, we consider a reputation-building phase of two periods ($T_1$, $T_2$) and an infinite maintenance phase of $T^\infty$. The assumption of an infinite maintenance phase is reasonable for an audit firm and in individual (audit) partner. Hence, reputation is attributable to the audit firm (or an individual audit partner) and the audit firm or shares of the firm can be sold at any time if no damage has occurred. Figure 1 illustrates the auditor’s decision situation:

![Figure 1. Model structure](image)

The sequence is as follows: Without reputation, the audit fee in the first two periods is $f_g$. When the auditor without reputation accepts the audit assignment for period $T_1$, he has to decide in $t_0$ about the level of care to be taken over this period $\lambda_1$. If no failure occurs for two periods, the auditor has built up his reputation and receives audit fee $f_p$. At every stage, the occurrence of a failure causes reputational damage and terminates the possibility of generating income from auditing activities, and the auditor faces alternative $A$. However, even if the reputation is maintained it is rational to continue providing audit services only if this is more
advantageous than alternative $A$. Hence, the alternative is a reference (similar to the implicit costs of an employer’s salary in business valuations) for the assessment of the attractiveness of gaining profits by participating further in the audit market. For simplicity, we assume that the alternative auditing is adjusted by alternative $A$. Thus the income generated with alternative $A$ can be set to zero in the non-liability scenario and set to the compensation payment by the auditor of $-L$ to compensate the entity in the liability scenario. These assumptions simplify the model but do not limit the derived results because the different perspectives will only affect the reference point comparing the two states. Hence, if in case of a reputation causing audit failure instead of a total loss of the income source a fee reduction (e.g. lower fee level) or an increase in fees in case of no failure is assumed this will affect the results quantitatively and not change the model systematically.

Due to the information structure at the reputation-building phase and the constant conditions in the maintenance phase, the optimal audit effort in the first and second period can be derived via backwards induction.

2.2.1 Maintaining phase

Due to the constant conditions in the maintenance phase an auditor has no incentives to change the optimal audit effort. With the audit fee $f_p$ and the audit effort in the maintenance phase, $\lambda_p$, the objective function $P^L_T (\lambda_p)$ maximizes the present value of future rents, modelled by:

$$P^L_T (\lambda_p) = \sum_{i=0}^{T} \frac{P(\lambda_p)}{(1+i)^t} (1-P_D(\lambda_p))^i + E_L(\lambda_p)$$  

Here, we model the expected profit of the maintaining phase without including the reputation building phase.
when the compensation payment \( L \) has to be paid by the auditor, the auditor’s decision situation takes the consequences from the expected liability \( E_L(\lambda_p) \) into account. In the event of an audit failure the auditor faces a liability payment in the subsequent period which terminates the option of generating profits from auditing. Thus, the auditor’s expected loss due to legal liability based on audit effort is:

\[
E_L(\lambda_p) = \sum_{t=1}^{T} \frac{-L}{(1+i)^t} p_D(\lambda_p)(1 - p_D(\lambda_p))^{t-1}
\]  

(4)

Replacing \( p_D(\lambda) \) by \( \frac{r}{(1+\lambda_p)} \) and \( E_L(\lambda_p) \) by (4) with the assumption of an infinite time span, the auditor’s objective function presented in (3) by considering a geometric row can be represented as:

\[
P_r(\lambda_r) = \lim_{i \to \infty} P_I(\lambda_r) = \frac{(1+i)(\lambda_p + 1)(f - \lambda_p c) - Lr}{i(\lambda_p + 1) + r}
\]  

(5)

For simplification we assume a constant discount rate \( i \).

Compared to the decision scenario without legal liability, the term \(-Lr\) representing the expected damage arising from an audit failure in (5) will be zero.

### 2.2.2 Building phase

Contrary to the maintenance phase, the reputation-building phase is characterized by a time frame. Without a reputation, the audit fee is \( f_B \). At the beginning in \( t_0 \), without reputation the expected profit consists of the (unconditional) profit from the current period plus the conditional present value of the profits of the future periods, composed of the profit of the second period and the profits in perpetuity of the maintenance phase. Apart from the discount factor, the only difference in the profits between the second and subsequent periods is contained in the audit fee, which is \( f_B \) in the first and second period and \( f_p \) in all subsequent periods.
2.3 Client’s decision situation (demand)

From the clients’ perspective, auditing should prevent damages \( (D) \) arising from failures in the integrity of financial statements. Usually an auditor is appointed for one period (one year), thereby allowing the client to confirm their decision about the appointment of an appropriate auditor every period. Before an audit the expected damage resulting from erroneous financial statements of an entity is \( E(D)_{NA} = rD \). From the perspective of the entity, auditing reduces the probability of incurring damage-causing errors, and additionally suffering damages leading to a compensation payment \( L \) paid by the auditor in case of auditors’ liability. Thus, the expected damage incurred is: \( E(D)_A = (D - L) p_D (\lambda) \). Consequently, the expected damage is reduced by the probability of such damage occurring and by the compensation payment \( L \) in the scenario where damage occurs. In agreement with the extant literature it is reasonable to assume that potential damages can significantly exceed compensation payments that could be claimed from the auditor, whereby \( D > L \) (i.e. Rothenberg 2019).

Hence, if the audit client (entity) can choose about the desired level of audit quality (audit effort) this level will depend on the relation of benefits and the related (audit) costs. In summary, the benefits of auditing consist of reduced expected damage \( D \) for the entity, which are offset by the audit related cost \( C(\lambda) \) the entity has to bear. Considering that, the costs appear in advance and the benefits are realized in the subsequent period the objective function of the risk neutral entity reads:

\[
EP_{client}(\lambda) = -C(\lambda) + \frac{(rD - p_D(\lambda)(D - L) - C(\lambda))}{i}
\]

Auditing is beneficial to the client if the reduction in expected damage is larger than the related audit costs. Consequently, the demanded level of audit quality (units of audit effort) and the
related level of risk reduction depends on the related costs per unit. The related auditing costs \( C(\lambda) \) depend on market situation and are discussed later in the analysis and results section.

3. Analysis and Results

3.1 The optimal audit effort single period –model

Risk-neutral auditors maximize expected profits. Maximizing expected profit (2) leads to optimal audit effort \( \lambda^* \to r \frac{L}{\sqrt{c}} - 1 \) in a single-period context. Optimal audit effort depends on error probability \( r \), liability \( L \), and marginal costs \( c \). In addition, as standard result of these models, it is we note that the audit effort decision (optimal audit effort) does not depend on the (unconditional) audit fee. In these models, the fee is only of relevance as auditor’s participation constraint. Making the auditor indifferent whether to participate in the audit or not, the fee has at least to cover the marginal fee that compensates the audit related costs. In case of auditor liability, the costs compose of direct audit effort induced costs and port-audit expected auditor’s litigation costs. When liability costs are neutralized in the event of reputational damage due to the absence of consequences arising from legal liability (\( L=0 \)), thus it follows (2) that no incentives exist to apply a positive optimal audit effort in a single-period scenario.\(^9\)

To reflect reputation in this single-period context reputation is modelled analogously to liability as reputational capital that can be lost (or reduced) in the event of a failure. Then, similar to auditors liability reputation provides positive incentives on audit effort. Consequently, the auditor’s marginal fee (reservation utility) depends on the auditor’s reputation (or reputational capital respectively). Accordingly, a higher reputation results in higher audit quality and related higher (marginal) audit fee. In this context, the analysis of Bigus (2011) shows that auditor’s

\(^9\)This results from the first order condition: \( \frac{\partial P(\lambda)}{\partial \lambda} \bigg|_{\lambda^*} = 0 \Leftrightarrow \lambda^* = 0 \).
reputation in combination with legal liability can lead to an excessive level of care (“overauditing”) by the auditor, to protect reputation. This results in a socially inefficient level of care because the investors have to pay too high audit costs. Such a scenario might exist in monopolistic market situations, where the auditor can set the audit fee at his disposition.

However, the subsequent analysis based on multi-period setting reveal that “overauditing” due to reputation directly results from the limitations of the single-period context and the exogenous definition of reputation as reputational capital.

3.2 The optimal audit effort to maintain reputation in multi-period setting

3.2.1 Incentives on audit effort by considering multi periods

The risk-neutral auditor’s effort is optimal if the benefits of a unit of audit effort equals the marginal cost of this unit. In a standard single period model the marginal utility of a decreasing expected liability is compared to the marginal costs of the auditor. The level of care is optimal if the costs of a further unit of audit effort equals the reduction in the probability of damage with this unit of audit effort (Caskey 2013). Thus, only the costs of the period under consideration are reflected in the calculus. In a multi-period-context this trade-off is fundamentally different because the effects of the current decision on future periods are considered. The utility of a further unit of audit effort reduces the probability of a trust-damaging failure and thus increases the probability of staying in the market (and earning future fees). Simultaneously, a further unit of audit effort increases direct audit costs (in this and future periods) thereby reducing future rents in a constant fee scenario.

Considering the effects of legal liability, the optimal level of care \( \lambda^*_P \) resulting from the first-order-condition of (5) (setting to zero and solving for the level of care) is:
Without liability, the optimal level of care without is denoted with \( \lambda^*_p \) and results from term (7) with \( iL = 0 \).

The optimal level of care depends on the marginal costs \( c \) of the auditor, the probability of a trust-damaging failure \( r \), the discount rate \( i \), and especially on the audit fee \( f_p \) that can be earned in future periods. A direct result of the model is that the audit fee does not only represent a participation constraint for the auditor as it did in a single period model, but directly affects the level of care in this multi-period context (it is \( \frac{\partial \lambda^*_p}{\partial f_p} > 0 \)). Hence, a higher fee is associated with a higher level of care, ceteris paribus. By contrast, ceteris paribus higher marginal costs of the auditor together with the discount rate adversely affect the optimal level of care because they negatively affect the relationship of profits to costs (it is \( \frac{\partial \lambda^*_p}{\partial c} < 0, \frac{\partial \lambda^*_p}{\partial i} < 0 \)). With liability the optimal level of care positively depends on the liability payment \( L \), where \( \frac{\partial \lambda^*_p}{\partial L} > 0 \).

A positive level of care requires that the fee satisfies \( f_p > c \left( 1 + \frac{i}{r} \right) \) which indicates that the fee exceeds the present value of marginal costs of audit effort. Therefore, a greater difference between fees and costs leads to higher rents and levels of care. In accordance with the results above we formulate Proposition 1:

**Proposition 1:** The consideration of multiple periods leads to significant differences in terms of the factors that determine the optimal audit effort compared to the single-period context.

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10 Mathematically a second solution exists (with a negative sign of the root), but this is not relevant due to the requirement of a non-negative level of care \( \lambda^*_p \geq 0 \).
Beyond the liability risk, the loss of the audit fee is now another source of risk for the auditor. Thereby auditors’ optimal audit effort increases in line with the audit fee.

Consequently, the dependence of audit effort on audit fee is in contrast to the results of standard model in analytical audit research, in which the audit fee only is relevant to meet auditor’s reservation utility. Whereas the liability is usually in the sphere of a standard setter, the audit fee can be affected by the (audit) client.

The result of influence of the fee on audit effort basically agrees with those of Elitzur and Falk (1996). In our model though, due to the infinite time span, no incentives arise to reduce the audit effort at the end of the auditor rotation period with a client because this will increase the risk of an audit failure and thus the loss of reputation and future income. Hence, our result is reasonable, if reputation is not client-related but attributable to the audit firm because there is not incentive jeopardize the reputation of the audit firm by saving costs with lower client related quality. In addition, later we enlarge the perspective to the client which has not be done by Elitzur and Falk (1996), and use the implication that clients can create incentives by the audit fee.

It is noteworthy that the incentives driving the level of care result from the fee of future periods and not from that paid in advance for current period auditing services. A higher fee results in higher profits (rents), ceteris paribus, and thus incentivizes higher audit quality. Thus, the future expected profits only result from audit reputation if it can be transformed into economic advantages through higher fees. If reputation does not lead to higher fees, reputation has no value and thus provides no incentives to maintain this worthless reputation.

This result implies that audit quality is higher with increased rents from auditing services. Because the maintenance of reputation depends on the possibility of generating profits from auditing, reputation may be affected by the marked situation. Based on the auditor-focused
perspective negative effects on audit quality can be derived through an increase in competition: If higher competition in an audit market leads to lower fees, which translates into lower profits (rents), this may negatively affect the audit quality in a market. Consequently, it is to be expected that audit quality is lower in competitive markets than in market situations allowing auditors to earn profits.

3.2.2 Reputation and legal liability

Due to greater risk the audit effort is always higher with legal liability. Therefore, the minimum fee (making the auditor indifferent to participating in the audit) is higher in the in case of legal liability, without which the participation constraint is not determined by a positive optimal audit effort but rather by the requirement of a non-negative expected profit.

Proposition 2: With legal liability, a higher potential liability payment results in a higher level of care, ceteris paribus.

Proposition 3a: At the same fee level, the optimal audit effort with a liability payment always exceeds the optimal audit effort without legal liability (it is $\lambda_{p}^{L >} > \lambda_{p}^{*}$), if $L > 0$, but the difference decreases with increasing fees.

The differences in optimal audit effort demonstrate that the absence of legal liability reduces the risk to the auditor and implies a lower level of audit effort (thereby reducing audit quality) and a lower minimal audit fee. However, with increasing fees, the effects of limited liability on audit effort become less important, ceteris paribus, because in a scenario of attractive clients (determined by a large difference between fees and audit costs), incentives driving audit effort are mainly attributable to reputation. With increasing fees, the difference between $\lambda_{p}^{L >}$ and $\lambda_{p}^{*}$ decreases, because in relation to the fees realized, the potential liability becomes less important (thus it is $\lim_{f \to \infty} (\lambda_{p}^{L >} - \lambda_{p}^{*}) = 0$).
At different levels of optimal audit effort, combined with a set fee level, (and thus Proposition 3) the scenario of higher levels of optimal audit effort than that induced by legal liability the same level of audit effort, is achieved at lower fee, which is summarized as:

**Proposition 3b:** If participation constraints in the scenario with limited legal liability are met, the same optimal audit effort is achieved at lower fees compared to the situation without limited legal liability.

Thus, incentivizing optimal audit effort using fees instead of liability is associated with higher fees. If higher fee levels are required than those induced by liability limitations, the investors may benefit from liability induced audit quality because higher quality is achieved at lower prices. By contrast, in the scenario of liability, lower levels of quality than are induced by liability are not contractible at lower fee levels and may result in inefficiencies.

*In summary, when the decision regarding the optimal audit effort in single periods is not separable from future periods, the incentives inducing the auditor’s optimal audit effort differ from those derived from single period-models. Therefore, in contrast to the results derived from single period models where the audit fee is the only participation constraint, in this model the audit fee directly affects the decision governing audit effort.*

In the maintenance phase, the optimal audit effort remains constant, because repeated decisions reveal no new information over time. The situation is different when no information about the auditor’s past failures is available, which is the case for a newly founded audit firm / or young auditors for example. In this scenario, reputation is established by successfully concluding audits, ensuring that no trust-damaging audit failures occur. Given the uncertainty arising from the lack of (positive) historical information, it is reasonable to assume that clients are not willing to pay the same fee for an auditor with a reputation compared to an auditor without one.
3.3 Optimal care levels in the trust-building phase

Because of the information structure at the outset and constant conditions established after two periods, the optimal audit effort for the second period $\lambda_2^*$ (determined in $t_1$) and the first period $\lambda_1^*$ (determination in $t_0$) are calculated via backwards induction as follows:

The decision one period before reaching the maintenance phase, in $t_1$, is the same decision as in $t_2$ since the incentives inducing the level of care in $t_1$ only result from the fees (profits) achievable in the future. Consequently, the optimal level of care $\lambda_2^*$ in $t_1$ is equal to the optimal level of care in the maintenance phase, indicated by $\lambda_2^* = \lambda_P^*$. One step earlier, at the beginning in $t_0$ the auditor’s effort decision in the first period does not depend on the unconditional fee of the first period but on the fee that could be earned in the second period, added to the present value of expected future profits from auditing in subsequent periods. Hence, the optimal level of care without reputation depends on the expected future profits from auditing and the marginal costs. Thereby, in the absence of litigation risk the level of care is mainly incentivized by the possibility to generate profits into the future. Hence, higher future expected profits increase the initial level of optimal audit effort.

Differences between the optimal audit effort in the first and subsequent periods result from differences between the audit fees $f_B$ and $f_P$. Consequently, if the fee in the second period equals or exceeds the fee with established reputation $f_B \geq f_P$ the level of care in the first period is at least the same or higher than in subsequent periods. Accordingly, if $f_B < f_P$ the optimal level of care of the first period is lower than in subsequent periods.

The influence of incentives on the level of care during the first period depends on the present value of both the expected profit of the second period and the perpetuity. In the scenario of high expected future profits, the perpetuity also dominates the level-of-care decision of the
first period and the corresponding influence of the fee from the second period is very small. The present value of the perpetuity is expected to greatly exceed that of the second period’s profit. Therefore, an auditor can accept lower fees (even fees below costs) if this is outweighed by future profits. This is in line with the results of DeAngelo (1981a). Our model differs in that we do not assume a constant level of audit quality because this is driven by audit fee levels. Nevertheless, our results show that pitching significantly lower fees at the beginning of an audit engagement does not necessarily significantly impair audit quality if it is driven by the incentive of future profits.

Significantly, regulations that aim to increase market competitiveness by opening the markets to smaller auditors might be counter-productive to the objective of higher levels of audit quality. Regarding audit quality, there is less cause for concern that newly established audit firms may deliver low quality if incentives exist to generate surpluses. However, if the increased competition results in a lower fee levels in the market (and therefore impacting negatively on profits), negative effects on audit quality are to be expected.

Furthermore, the existence of reputation determines whether the audit fee can be used as an indicator of audit quality. In the absence of a reputation, auditors may be incentivized to provide high quality services at lower prices to penetrate the market. Audit quality will then be driven by the prospects of future achievable profits. However, from the demand perspective, there is higher uncertainty about the audit quality because the auditor without reputation has not proven in past audits that trust in his abilities is justified. In this scenario, there is no direct link between the negotiated audit fee and the audit quality in the reputation-building phase and we argue that without a reputation, the audit fee is a poor indicator of audit quality.

By contrast, in the case of auditors that successfully establish their reputation, the audit fee is an indicator of audit effort and can be used by clients in informing the process of appointing auditors. From a practical perspective, a necessary condition for assessing the audit
quality based on the audit fee is that the auditor’s costs are assessable (including, among others, the auditor’s technology and efficiency). At least during the selection and appointment process, it is reasonable to assume that such an assessment is possible at the level of governance structures, such as an audit committee. The difference between the audit fee and the costs (representing the auditor’s efficiency) finally determines their ability to generate profits from auditing services.

In summary, the effects attributed to the development of reputation are that an auditor without a reputation must not necessarily deliver a lower quality service if future rents from auditing can be expected. In the absence of a reputation, however, the audit fee is no indicator for audit quality because of missing positive signals from previous failure-free audits; and low-balling incentives for auditors. From the perspective of an audit firm, the reputation building phase is not a long-term equilibrium state, and are thus not meaningful to analyze the effects with existing reputation. Therefore, we focus on reputational auditors for the subsequent analyses.

### 3.4 Equilibrium audit quality

Significant to this analysis is the finding that the optimal audit effort depends on the audit fee. With an existing reputation, this relationship leads to an optimization challenge for prospective audit clients who constitute audit demand. The action variable for the client who appoints the auditor is the audit fee.

**Supply**

According to Proposition 3b the audit fee, dependent on the audit effort can be described as:

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11 According to the UK Financial Reporting Council audit committees should ensure that appropriate plans are in place for the audit, assess the abilities of the auditor, and provides guidance for this evaluation (Financial Reporting Council 2016, 2019)
In the absence of legal liability the fee simplifies to the first expression of the term shown in (8) and is denoted with \( f_p(\lambda) \). These fees \( f_p^L(\lambda) \) and \( f_p(\lambda) \) describe the supply function (s) of audit quality (fee and audit effort).

Legal liability induces an additional risk (to the loss of the income source) to the auditor. For taking this risk the auditor requires a compensation. Thus, the audit fee composes of the two components direct audit costs and expected liability costs. Hence, in case of legal liability the auditor requires a positive fee to meet his participation constraint. The minimum fee (offsetting auditors expected profit to zero and making the auditor indifferent in participating in the audit) depending on the level of audit effort is as follows:

\[
f^L_{p_{\min}}(\lambda) = c\lambda + \frac{Lr}{1+i}\frac{1}{1+\lambda(1+i)}
\]

Hence, in case of legal liability \( (L>0) \) the auditor requires a positive fee to meet his participation constraint. The situation differs in the absence of legal liability, then the marginal audit fee only has to cover direct audit costs, and it is \( f^L_{p_{\min}}(\lambda) = c\lambda \).

Only in a market situation with a monopolistic auditor and clients subject to auditing the auditor can dictate the audit fee. In all other situations, the audit fee is affected also by the demand of auditing.

Due to the relationship between the audit fee and the audit efforts of auditors with a reputation, the client can implement any level of audit effort that is above the respective minimum fee in meeting the participation constraint of the auditor) by determining the audit fee.

**Demand**
The demanded level of audit effort maximizing clients expected profit depends on the relation between audit effort and audit costs. If the entity has to bear direct effort-related audit costs, it is \( C(\lambda) = c\lambda \), the client’s expected profit shown in (6) reads:

\[
EP_{\text{client}}(\lambda) = -c\lambda + \frac{(rD - p_D(\lambda)(D - L) - c\lambda)}{i}
\]  

Replacing \( p_D(\lambda) \) by \( \frac{r}{1 + \lambda} \), the level of effort maximizing clients expected profit resulting from FOC is:

\[
\lambda^* = \frac{r}{\sqrt{c(1+i)D - L}} - 1
\]

Hence, the required level depends positively on client’s potential damage \( D \), the probability of a failure \( r \), and negatively on the compensation \( L \) in case of audit failure and negatively on the marginal costs \( c \). Consequently, the demanded level of audit quality increases with increasing investors potential damage. Replacing the costs \( c \) by \( f \lambda \) in (11) and solving for \( f \) results in the client’s fee (willingness to pay) as a function of audit effort:

\[
f^*_{\text{Client}}(\lambda) = \frac{\lambda r^2 (S - L)}{(i+1)(\lambda + 1)^2}
\]

From the client’s perspective, audit effort is optimal when marginal costs of the further unit of audit effort (represented by the audit fee) equal the benefit from auditing (in terms of the reduction of the clients’ expected damage). Thus, a greater expected damage increases the demand for better audit quality and results in an increased willingness to pay the audit fee in return for higher audit quality in terms of reduced expected damage post-audit. Because the liability payment directly lowers the damage \( D \), ceteris paribus, a lower liability payment \( L \) in
the event of damage increases $\lambda^*_{client}$. Therefore, in the case of high potential damages, $D$, and low $L$ (for example in jurisdictions with low liability limits) the level of audit effort required by the client is higher, ceteris paribus.

Regarding the equilibrium between supply and demand two different market situations are to distinguish. First, when the client dominates the market and second, when auditor and client

1. **The entity (demand) dominates the market (supply)**

In the case the entity dominates the market the entity will pay the audit service at auditor’s marginal audit fee. Then, the equilibrium level of audit effort $\lambda^*_{market}$ is determined by equaling the demand displayed in (12) with the marginal audit fee shown in (9), hence

$$f_{client}^*(\lambda) = f_{P_{min}}^L(\lambda) \iff \lambda^*_{market}$$

The corresponding fee results by inserting $\lambda^*_{market}$ in auditor’s marginal fee according to (9). In this market situation the client chooses the level audit effort that maximizes his expected profit.

In such a market situation the client receives (highest) audit quality at lowest price, and the auditor will receive no rent, and consequently reputation is not payed.

2. **Equilibrium of supply and demand**

The scenario, where equilibrium audit quality and equilibrium price result from negotiations between supply and demand seems more realistic. The equilibrium level of care with the corresponding equilibrium free results from equaling the demand in (12) and the supply according to (8), thus

$$f_{client}^*(\lambda) = f_{P}^L(\lambda) \iff \lambda^*_{market}$$

In such a market situation the equilibrium level of care is equal or lower than in the case when the investor dominates the market due to a worse

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12 Although the solution can be derived mathematically, it is a complex expression. Therefore, we show the implications based on numerical examples and refer to the first order conditions of clients and auditors when analyzing the effects on (equilibrium) audit effort.
cost quality relation from client’s perspective. By contrast such a market situation potentially enables the existence of auditor’s reputation.

Because the requirements of the auditor and the client are satisfied under this condition, this audit effort represents the equilibrium audit effort (and corresponding equilibrium audit fee by inserting $\lambda^{market}$ in (8)) between the auditor and the audited entity.

The determination of the audit quality by equaling the supply and demand results in an endogenous determination of the audit fee. Because the required audit quality depends on the clients expected damage that may differ between different companies, this model implies that a uniform audit quality is associated with inefficiencies. Clients with higher potential damages arising from a larger firm value that can be impaired (as in a listed companies) following failures, will demand higher levels of care from auditors, which aligns with the empirical evidence (Bergner et al. 2020; Barton 2005). The demand for audit quality determines the clients’ willingness to pay, limiting audit quality on the demand side.

Since audit fees affect the profits generated from auditing, while linking to reputation, they are also determined endogenously. Thus, auditors are not able to build infinite reputations preserved by high quality service at client’s expenses. In this context, auditors cannot charge a high fee to maintain a high reputation because this is not paid by the clients. Thus, in contrast to Bigus (2011), in our model the existence of reputation cannot result in an overcompensation because the client can adjust the required level of care by re-setting the audit fee. Overcompensation only can occur if the requirements of the liability regime (and the corresponding insurance premiums) result in higher optimal levels of audit effort (defined by the legal system, legal liability, or corresponding insurance premiums) than is required by the client. Subsequently, clients would have to pay for a higher level of care defined by the legal system than is required by their own cost-benefit assessments. In this case clients would only
be willing to pay the lowest possible fee, which is the minimum fee that makes the auditor indifferent to accepting the mandate. This in turn results in the situation where the auditor is unable to receive a premium for their reputation.

**Numerical Example**

Based on a numerical example with parameters \( r = 0.20, c = 1,000, S = 30,000,000 \), we subsequently discuss the relationship between supply and demand regarding the equilibrium audit effort (audit quality) and the role of reputation depending on clients market power and legal liability. Thereby we focus on three different scenarios of legal liability. Depending on audit fee, the solid black line indicates the demand (12) and the dashed line the supply (8) of audit effort. The dotted line indicates the auditors minimum fee, and thus auditor’s participation constraint. The grey area shows situations where auditor’s participation constraint is violated because the fee is below auditor’s minimum fee.

![Figure 2. Supply and demand of audit effort with no legal liability](image-url)
Figure 3 refers to a scenario (Scenario A) without legal liability ($L=0$). In the absence of legal liability the auditor’s minimum fee must at least cover the effort related audit costs. If the client has market power to receive audit effort at the auditor’s minimum fee the equilibrium is defined by the intersection of the solid line with the dotted line, with an audit effort of $\lambda_{\text{min}}^{\text{Market}} = 32.0862$ and the corresponding auditor’s minimum fee $f_{P}\left(\lambda_{\text{min}}^{\text{Market}}\right) = 32,806.2$. In contrast, in a situation with perfect completion the “free play” between supply and demand results in equilibrium audit effort of $\lambda^{\text{Market}} = 12.9858$ and the corresponding equilibrium audit fee $f_{P}\left(\lambda^{\text{Market}}\right) = 75,872.59$. In this scenario without legal liability, solely the audit fee provides incentives for the auditor to apply the (equilibrium) audit effort, and the client’s willingness to pay for this level of audit quality enables the auditors to earn profits and thus the existence of reputation. Audit quality in this case is attributable to reputation. Depending on clients expected damage, the absence of liability, enables clients with lower potential damage $D$ to contract lower levels of audit effort at a lower fees as long as auditor’s reservation utility is met.

Next, we refer to a situation with the implementation of legal liability
Figure 3. Supply and demand of audit effort with legal liability

Figure 4 shows a scenario (Scenario B) with legal liability, where the liability induced audit effort equals the equilibrium effort derived by perfect competition between supply and demand. With the given parameters this situation requires a (calculated) liability limitation of $L = 2,670,949.94$. This situation is results in an equilibrium audit effort of $\lambda_{L,\text{Market}}^{\ast} = \lambda_{\text{min}}^{\ast} = 21.5555$ and the corresponding audit fee $f_{P}^{\ast} \left( \lambda_{L,\text{Market}}^{\ast} \right) = f_{\text{min}} \left( \lambda_{\text{min}}^{\ast} \right) = 44,111.08$. Compared to the situation without auditors legal liability the implementation of legal liability results in an advantageous situation for the clients. Due to the incentives of legal liability on audit effort, leads to the situation that the client must not provide incentives by the audit fee. The equilibrium audit effort in the market increases from 12.8106 to 21.5555 whereby the corresponding fee decreases from 75,875.59 to 44,111.08. In this case, reputation will not lead to higher audit quality because the clients demanded level of audit quality is implemented by legal liability. Thus, from client’s perspective it is not advantageous to incent the auditor applying higher effort by a higher fee.
The intersection of the supply and the minimum fee indicates the auditor’s optimal audit effort induced by liability. Higher levels of effort must be incentivized by a larger audit fee, whereas lower levels of audit effort are not contractible at lower fees. However, if liability limitation induces incentives on audit effort exceeding the level demanded by clients auditing will causes inefficiencies (Scenario C).

**Figure 4. Supply and demand of audit effort with excessive liability**

In case of excessive liability, no equilibrium level of audit effort exists. The liability induced effort results in a higher level than required by the client. The liability induced minimum level of audit effort (resulting from auditor’s FOC) is $\lambda_{\text{min},L} = 29.8607$ with the corresponding (minimum of the) minimum fee $f_{\text{min}}(\lambda_{\text{min},L}) = 60,721.34$. Compared to Scenario B the liability induced audit effort increases from 21.555 to 29.8607 and the related (minimum) audit fees from 44,11.08 to 60,721.34. The increase in the audit fee is solely attributable to liability increased effort. Hence, the increased liability increases audit effort in the market but is related to inefficiencies because the client has to pay the audit fee for a level of audit quality that is
above the demanded level and thus the clients willingness to pay. Consequently, such a situation leaves no space for reputation because clients willingness to pay is lower than the liability induced minimums fee.

Summarized without liability, the equilibrium audit quality is achieved by a larger fee, and auditors and clients can contract over the optimal quality (and the corresponding audit fee). Audit quality in this case is attributable to reputation.

The situation is different with liability. If liability induced quality is lower than the quality required by the client, the liability induced quality level can be increased to the demanded level either by more extensive legal liability-limitations or by charging a higher fee. Hence, in this case incentives arising from reputation are only relevant if clients demand a higher audit quality than what is implemented by legal liability. If the liability induced effort (and thus the marginal fee) is higher than the level of effort demanded by the client this results (in the case of mandatory auditing) in “over auditing” and inefficiencies because the client has to accept and pay for a higher (liability induced) quality than is required by his anticipated damage level (shown in the dark gray area marked with A).

Whereas the liability imposed by the standard setter who defines the liability regime determines a unique level of quality, incentivizing the level of care using the audit fee is in the sphere of the client and enables them to contract individual quality levels.

In summary, two effects of liability are important. First, a level of liability induced quality that is too high may result in over auditing and inefficiencies if the minimal audit fee (minimum audit quality) exceeds the audit quality required by the client. Alternatively, if clients require higher quality than that induced by legal liability, an increase in legal liability advantages investors because of incentives stemming from possible liability, and higher quality
is achieved at lower fee levels. This benefits of legal liability are shown in the transition from Scenario A to Scenario B because the client receives higher quality at a lower fee.

By contrast, the implantation of legal liability is always at the expense of the auditor because the auditors’ (initial) risk is increased but the clients’ willingness to pay is limited. If the fees cannot be increased sufficiently due to the market situation (demand) the introduction (increase) of liability reduces auditor’s expected profits, and thus the possibilities to transform reputation in economic advantages. Increasing incentives from legal liability reduce the importance of reputation. Consequently, an excessive liability is to assess negatively by both perspectives of auditor’s and client’s.

4. Conclusion

In this study, we explored the relationship between auditor reputation and the efforts of auditors using an analytical approach. To analyze important characteristics of reputation we developed a multi-period model, implying that decisions in the current period affects future periods. As in all analytical research, simplifying assumptions, such as risk-neutral parties and not distinguishing between liability and reputational causing failures, may limit the generalization of our results. Nevertheless, we consider that our model provides useful insights into the relationship between an auditor’s reputation and decisions driving audit effort, especially in the scenario of insurance with limited liability.

In answering our first research question, we identified as a direct result of the multi-period model, the dynamic relationship between audit effort and audit fees. This is fundamentally different to standard single period models where the audit fee only represents the auditor’s participation constraint but has no impact on audit effort. According to our model a higher fee results in higher audit quality. Related to research question two, as determined by our model, the audit fee and ability to be profitable from auditing, ultimately determines the
existence of their reputation. If reputation leads to economic advantages this creates incentives for an auditor to build and maintain their reputation. Therefore, audit quality is expected to be higher in market conditions attracting higher fee levels and resulting in higher profits for auditors.

The results suggest that the fee is an appropriate indicator of audit quality for auditors with known reputations. However, in the case of auditors with no reputation a lower fee must not indicate a lower audit quality. If auditors without reputations can expect to receive benefits from their reputation into the future, they have an incentive to provide high quality audits.

Our third research question refers to the demand side of audit quality and is answered as follows: Due to the relationship between audit fees and audit effort, for auditors with reputations their clients can influence the required quality of audits by setting the audit fee. The demand for audit quality depends on the risk of the client and the market situation. In competitive markets the interplay of supply and demand results in the endogenously determination of an equilibrium audit quality at the corresponding audit fee, dependent on the damage expected by clients. This excludes the possibility for auditors to generate high rents and the related problem of excessively high audit quality provided by the auditors to save their reputation.

Moreover, we show that too high audit efforts (quality) can only result from statutory liability. In the absence of legal liability lower audit quality can be incentivized by adjusting the fee to the demanded level. From investors perspective the assessment of legal liability is not uniformly and depends on the situation of the entity. If expected damages for the entity are high, the absence of legal liability may be disadvantageous because the higher quality must be incentivized through higher fees as compared to a system with legal liability. Finally, the model establishes that overcompensation from the client’s perspective due to an excessive level of audit effort can only result from liability induced incentives and not from reputational pressures.
We believe that our study makes a significant contribution to the literature by investigating the reputation and credibility of auditors in a multi-period context, and the results of our analytical research generate new insights into the central auditor client-relationship. Audit fees are a proxy for audit quality only if the auditors’ effort decisions are governed by their reputation rather than by the institutional environment; thus, empirical research should incorporate the situation of the audit market. Investigating audit quality within the stronger demand-driven environment of attractive markets would be a fruitful area for future research. When defining the institutional parameters, policymakers and standards setters should consider that typical institutional measures (such as the definition of the liability regime and liability limitations) have differing impacts dependent on the attractiveness of the audit market. In this respect, our study may stimulate further research.
REFERENCES


The following proofs are derived under the following assumptions:

\( \{ r > 0, D > 0, L > 0, i > 0, f > 0, c > 0 \} \)

**Proof of Proposition 2:**

\[
\frac{\partial^2 \lambda_p^*}{\partial L} = \frac{ir}{2\sqrt{(i+1)r c ((i+1)c(i+r)+i(f_p i + f_p + i L))}} > 0
\]
**Proof of Proposition 3a:**

For the same fee, the audit effort is higher with legal liability.

\[
\lambda^*_p - \lambda^*_p = \sqrt{\frac{r c \left( c(i+r) + i \left( f_p + \frac{iL}{i+1} \right) \right)}{i c}} - \sqrt{\frac{r c \left( c(i+r) + i \left( f_p \right) \right)}{i c}} > 0 \quad \text{which is always true}
\]

if \( \frac{iL}{i+1} > 0 \), because \( L > 0 \) this relation is fulfilled, and the proposed relationship is true.

And it is: \( \lim_{f \to \infty} \left[ \lambda^*_p - \lambda^*_p \right] = 0 \). Thus, differences between optimal audit effort decrease with increasing fees.

**Proof of Proposition 3b:**

Other than in Proposition 3a (where we show that same fee is related to higher audit effort without liability insurance, in Proposition 4 we show that same level of audit effort is related to a lower fee without liability insurance. According to (13) the investor sets the fee as follows

\[
f_p = \frac{c \left( i \left( \lambda_p + 1 \right)^2 + 2 \lambda_p r + r \right)}{r} \quad \text{if no legal liability exist, and}
\]

\[
f_p^L = \frac{c \left( i \left( \lambda_p + 1 \right)^2 + 2 \lambda_p r + r \right)}{r} - \frac{iL}{i+1} \quad \text{if auditor covers the damages himself. Hence, with given parameters its} \quad f_p - f_p^L = \frac{iL}{i+1} > 0 . \text{Thus from investor’s perspective the same quality without auditor’s liability is achieved at higher costs compared to a situation with auditor’s liability.}