



# An empirical test of spatial competition in the audit market<sup>☆</sup>

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## ABSTRACT

This study empirically examines the effects of competition through differentiation on audit pricing. Based on prior economic theory on differentiated-product markets (e.g., Hotelling, 1929; Tirole, 1988), we hypothesize that audit fees are affected by an auditor's relative location in a market segment. We define audit markets per industry segment and U.S. Metropolitan Statistical Area and specify an auditor's industry location relative to the client (auditor–client industry alignment) and relative to the closest competitor (industry market share distance to closest competitor). We find that audit fees increase in both auditor–client industry alignment and industry market share distance to the closest competitor.

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## 1. Introduction

While numerous studies investigate the effect of audit firm characteristics such as auditor size and industry specialization on the pricing and quality of audits supplied at the client level, few empirical studies examine the effects of competition through differentiation on audit pricing.<sup>1</sup> Thus, while most previous audit fee studies report fee premiums for Big N auditors or industry specialists, they cannot shed light as to whether such premiums are due to specialized industry knowledge *per se* and/or market power effects due to differentiation from competitors. The purpose of our study is to theoretically distinguish between these two effects and then empirically test both of them. Consistent with Chan (1999), we draw on spatial economics to provide a theoretical base for competition through differentiation in the audit market and to develop empirical measures used in our empirical tests.

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<sup>1</sup> See, for example, Simunic (1980) and Francis (1984) for landmark studies that triggered several subsequent pricing studies at the client level. Hay et al. (2006) provide an overview and meta-analysis of audit fee research. For a thorough review of the audit quality literature, see Francis (2004).

Arguing that the audit market is a differentiated-product oligopoly, that is, that auditors can use industry specialization to differentiate their products and thereby soften price competition, we examine how the incumbent auditor's location in the audit market affects audit pricing. We capture market location along two dimensions: the incumbent auditor's location relative to the client (auditor–client industry alignment) and the incumbent auditor's location relative to its closest competitor in the market (industry market share distance to closest competitor). Our analysis sheds light on the relation between competition and product differentiation through industry specialization by auditors, and contributes to the existing auditing literature by examining not only the effect of industry specialization on audit fees, but also the effect of market power due to differentiation from the closest competitor as measured by the distance between an auditor's industry market share and that of its closest competitor.

Prior economic theory on competition among oligopolists suggests that firms compete on price and quantity once all the firms in the market have made product entry and space decisions (Hotelling, 1929; Shapiro, 1989). Competing firms that differentiate their products may be able to maintain prices that are higher than marginal cost in equilibrium without losing market share. Consistent with this argument, we hypothesize that the audit fee charged is increasing in the degree of alignment between the incumbent auditor's differentiation strategy and the client's preferences (Hypothesis 1). However, firms' price elasticities are also affected by the product-space locations of competitors. For instance, in cases in which competitors are closely related in product space, theory predicts that equilibrium prices will be closer to marginal cost. Based on these arguments we further conjecture that the audit fee charged is affected by the incumbent auditor's location in an audit market segment relative to the location of its closest competitor. In particular, the farther (closer) is the closest competitor's product-space location (captured, for example, by the degree of audit industry specialization) relative to that of the incumbent auditor, the higher (lower) the audit fee will be, *ceteris paribus*. We therefore predict that the distance between an incumbent auditor and its closest competitor in terms of industry market share is positively related to the audit fee the incumbent auditor is able to charge (Hypothesis 2).

We test our two hypotheses using U.S. data on Big 4 audit fees and client characteristics of relatively large public companies for the years 2005 and 2006. Following recent literature (e.g., Francis et al., 2005), we argue that auditors compete for clients at the local office level (rather than at the national level) and thus we begin by defining audit markets according to 2-digit SIC industry segments per U.S. Metropolitan Statistical Area (MSA). We then estimate an audit fee model that includes standard explanatory variables derived from the audit fee literature (Hay et al., 2006). Our two test variables are designed to capture whether audit pricing is a function of an auditor's location in a market segment. The first of these location variables is an auditor–client alignment variable, which we measure using industry expertise as proxied by an audit firm's industry portfolio share (see, e.g., Neal and Riley, 2004).<sup>2</sup> Our second location variable is a novel measure of the distance between the incumbent auditor's industry market share and that of its closest competitor. This measure is based on prior literature on discriminatory pricing in bank lending (Degryse and Ongena, 2005).

We find that, consistent with our hypotheses, audit pricing increases not only in the degree of auditor–client alignment as measured by the auditor portfolio-based proxy for industry specialization, but also in the distance between the incumbent auditor's industry market share and that of its closest competitor. These results are in line with auditors competing according to a Hotelling-type of model: auditors compete on fees, but because clients are willing to pay a premium for auditors that are more specialized towards their characteristics, auditors can specialize in certain industries to soften price competition and earn a fee premium. The size of the fee premium from specialization, however, is affected not only by industry specialization itself, but also by the distance (in terms of industry market share) between the incumbent auditor and its closest competitor. Our analyses further indicate that audit market concentration per se does not increase (but rather decreases) audit fees, whereas the distance between competing auditors does. Because we cannot observe auditors' price-cost margins, we are unable to examine the magnitude of the economic rents earned through the location variables in our analysis.

The remainder of the paper is organized as follows. Section 2 discusses the study's motivation and contribution. In Section 3 we present the theory and develop the paper's hypotheses. Section 4 presents the research design and Section 5 discusses the sample and data. The primary results are presented in Section 6, whereas Section 7 presents robustness checks and Section 8 supplementary analyses. Finally, limitations of the study and conclusions are presented in Section 9.

## 2. Motivation and contribution

The audit market is characterized by a high level of concentration, regulated demand for audits by listed firms, and high barriers to entry due to reputation effects and the need for specialized knowledge. Regulators in different countries often express concerns about whether the degree of competition in the audit market is sufficient. For example, in a speech at the 2005 AICPA National Conference, former SEC Chairman Christopher Cox noted that (Cox, 2005):

“... within the accounting profession and within the SEC, we are forced to ask ourselves: ‘Is this intense concentration in the market for large public company auditing good for America?’ If you believe, as I do, that genuine competition is essential to the proper function of any market the answer is no.”

<sup>2</sup> We argue that in a test of spatial competition, portfolio share-based measures of industry specialization are better suited to capture client–audit firm alignment as compared to market share-based measures, as the latter capture how well an audit firm has differentiated itself from its competitors and thus to some extent also pick up market dominance with respect to the auditor's closest competitor—the market share distance effect in our analysis (i.e. our second location variable).

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