Audit Office Labor Market Proximity: Balancing Labor Market and Audit Market

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Abstract: Lee et al. (2022, The Accounting Review) identify the benefits for audit offices of being close to targeted universities. This paper extends their work by incorporating competition within the audit market. Drawing on spatial economics, this study examines the optimal location of audit offices in both monopoly and duopoly audit markets, considering variations in labor demand and differences in recruitment costs across universities. The findings suggest that in a monopoly audit market, the location of an audit office is primarily driven by its proximity to the targeted university, with the office's position adjusting based on both the university's location and the cost structure. In a duopoly audit market, the competition between two audit offices complicates location decisions, as both offices adjust their positions in response to labor demand and competition within the audit market. The results emphasize the importance of considering labor market conditions and audit market competition when evaluating the location of audit offices.

Keywords: Proximity, Audit Office, Labor Market, Audit Market, Location Competition

1. Introduction

The optimal location of audit offices depends not only on the labor market but also on the audit market. Specifically, factors such as the costs of recruiting staff auditors from target schools (Lee et al., 2022) and the transportation costs of service delivery need to be considered. Additionally, the location of audit offices influences price competition among local firms (Gigler and Penno, 1995). This research, therefore, examines the optimal locations for audit offices based on proximity to key talent pools and the level of competition in the audit market.

According to the data from Lee et al. (2022), Big 4 offices in the United States fill about 90 percent of their graduate positions by recruiting graduates from two sources: the 256 schools listed by PwC as feeder schools (PwC, 2025) and AACSB-accredited business schools. Lee et al. (2022) argued that this trend is likely the result of targeted schools offering better support for students' transition into audit offices. Additionally, they found that audit offices located closer to a greater number of targeted schools demonstrate higher audit quality, but only when there is a larger audit office or higher concentration of audit offices in the city. On one hand, Lee et al. (2022) argued that larger audit offices or a higher concentration of audit offices in a city increases the demand for graduates from top accounting schools. On the other hand, their analysis aims to minimize competition in the audit market, as local markets with larger offices or higher concentrations tend to approach a monopoly. As a result, Lee et al. (2022) only need to control for the number of other offices from the same audit firm within 60 to 180 miles of an office, without accounting for the number of offices from different firms within that same distance. To extend the findings of Lee et al. (2022) to more scenarios, the optimal location of audit offices should consider both proximity to key talent pools and the level of competition in the

audit market.

This research provides valuable insights into how the proximity of audit offices to key universities affects their audit fees and profitability, highlighting the complex relationship between labor market demand, cost structures, and competition in the audit market, all of which influence audit office location decisions. By examining both monopoly and duopoly market structures, the study emphasizes the importance of strategic positioning for audit offices aiming to optimize recruitment outcomes and overall performance. The findings reveal that in the monopoly audit market, an audit office is typically located closer to the university from which it recruits staff auditors. In duopoly markets, both offices cluster closer together, with competition between the two leading to strategic adjustments in their locations. This clustering can reduce the profitability of both offices as their proximity intensifies competitive pressures in the audit market. Furthermore, higher labor demand and increased recruitment costs from universities further influence office locations, amplifying the impact of labor market forces.

This research makes two academic contributions and one practical implication. First, it addresses a fundamental question in auditing literature: whether competition in the audit market affects audit pricing. It does so by incorporating an important dimension—the distance between audit offices in a local area. Many previous studies have used market share, measured by the number of audit offices or the total audit fees, to assess competition in the audit market. However, these studies have produced mixed results regarding the impact on audit fees (Bandyopadhyay and Kao, 2004; Carson et al., 2012; Dunn et al., 2019; Eshleman and Lawson, 2017; Ferguson and Stokes, 2002; GAO, 2008; Gerakos and Syverson, 2015; Maher et al., 1992; Numan and Willekens, 2012; Pearson and Trompeter, 1994; Simunic, 1980). As a result,

previous studies (Choi et al., 2024; DeFond and Zhang, 2014) have called for further research into audit market competition, including incorporating insights from economic literature (Causholli et al., 2010). By integrating spatial economics (d'Aspremont et al., 1979; Hotelling, 1929; Lai and Tabuchi, 2012) into the audit market competition, this paper identifies the distance between audit offices of different firms in the local area as another significant factor. This finding aligns with previous literature (Dunn et al., 2019), which suggests that competition can be measured based on audit market concentration within a metropolitan statistical area (Brockbank et al., 2023; Eshleman and Lawson, 2017; Newton et al., 2013), core-based statistical area (Aobdia et al., 2024; Francis et al., 2022; Hallman et al., 2022; Lee et al., 2022), or even a city (Dunn et al., 2019). Consequently, future archival studies could directly examine the distance between audit offices in local areas and consider transportation improvements, such as bullet trains (Pan et al., 2023) or direct flights (Francis et al., 2022), to more accurately measure the degree of competition in the audit market.

Second, this research applies a theoretical framework from spatial economics to connect two main areas of literature: the auditor labor market and the audit market. Following Causholli et al. (2010), who called for more research into the auditing labor market, several studies have since focused on this area (e.g., Aobdia et al., 2024; Lee et al., 2022). However, labor market conditions differ from audit market conditions (Aobdia et al., 2024), meaning that the optimal geographic location of audit offices must consider both factors. To explore this relationship, the analytical framework from spatial economics provides a useful approach and has already been applied in auditing literature. For example, Chan (1999) used Hotelling (1929)'s framework to analyze the alignment between auditors' and clients' specializations and their

subsequent effects on audit fees, a finding that was empirically supported by Numan and Willekens (2012). This approach is an extension of Hotelling (1929)'s model of differentiated pricing. Another extension of Hotelling's model considers transportation costs for inputs (e.g., Lai and Tabuchi, 2012), specifically the recruiting costs for staff auditors. One factor driving this is the desire to be closer to a scarce talent pool, as hosting more recruiting events near schools can help attract more graduates to become staff auditors (Lee et al., 2022). On the other hand, there is also the need to avoid local competition—being closer to other audit offices increases competition within the local audit market (Ettredge et al., 2020). This tension arises from the interaction of labor demand, competition in the audit market, and variations in recruiting costs associated with different pools of staff auditors.

Third, this research helps audit firms identify the optimal location for their offices. When opening a new office or relocating an existing one to a new city, audit firms must consider several factors, including labor demand, competition in the audit market, and differences in recruiting costs across various talent pools. An office may be placed near a talent pool to meet labor demand (Lee et al., 2022). However, if many audit firms adopt the same approach, the resulting overcrowding in the audit market could diminish the benefits of proximity to the talent pool.

In Section 2, the study first investigates the location decision of audit offices in a monopoly audit market, where an audit office is the sole provider of auditing services. Here, the office's location is influenced by factors like proximity to universities that supply talent and the local demand for staff auditors. Section 3 builds on this by considering a duopoly audit market, where two competing audit offices must strategically position themselves in relation to universities and one another. Sections 4 and 5 examine how variations in recruitment costs from different universities and

higher labor demand affect the location decisions of audit offices. Section 6 concludes by summarizing the findings and discussing their implications for audit market competition and efficiency.

2. The Basic Model of Monopoly in the Audit Market

The monopoly establishes an audit office in a linear city (Lai and Tabuchi, 2012). By recruiting a group of staff auditors from graduates of targeted universities, this audit office can provide audit services to clients located throughout the city (Lai and Tabuchi, 2012). Clients are uniformly distributed along the interval [0, 1], with each client purchasing a single unit of service from the sole audit office (Chan, 1999; Lai and Tabuchi, 2012). Three universities are located in this linear city, with two types of universities. One type is located at position "a," while the other type is situated at the city borders, at positions 0 and 1. This layout is illustrated in Figure 1. The first type is fewer in number than the second, which aligns with Lee et al. (2022), who note that only a limited number of universities are on the target list of audit firms. Because the universities at positions 0 and 1 are of the same kind, if an audit office prefers to recruit staff auditors from this type, it can choose to recruit from the university that is closer, either at position 0 or 1.[3] Let "a" be assumed to lie between 0 and 0.5, as the outcomes when "a" is between 0.5 and 1 are similar to those when "a" is between 0 and 0.5. Therefore, the results for "a" between 0.5 and 1 can be derived from those when "a" is between 0 and 0.5. According to previous studies (e.g., Lai and Tabuchi, 2012), the monopoly covers both recruiting and transportation costs to deliver

[3] In a situation where the second audit office, located near 1 in a duopoly, prefers to recruit staff auditors from the border, there is no need to restrict the source of staff auditors it hires. The office can recruit staff auditors from either of the universities at 0 or 1. However, if the second audit office recruits staff auditors from the university at 0, an equilibrium will not be reached. As a result, this study assumes that the second audit office recruits staff auditors from the university at 1.

services. Transportation costs are assumed to increase quadratically with distance (d'Aspremont et al., 1979).

[Insert Figure 1 here.]

In practice, most graduates are recruited by audit offices as staff auditors (Aobdia et al., 2024; Lee et al., 2022; Moritz, 2014; Nieh, 2016). Therefore, this study assumes that universities are the main source of staff auditors for audit offices. Since graduate recruitment is typically conducted through campus recruiting (Causholli et al., 2010; Lee et al., 2022), the study assumes that the recruitment costs incurred by audit offices are similar to the transportation costs between audit offices and universities. This study also assumes that graduates from three universities are located exclusively at those institutions, based on the preference for local work (Lee et al., 2022; Manning and Petrongolo, 2017), interstate restrictions on CPA practice (Aobdia et al., 2024; Donabedian, 1991; Henry and Hicks, 2015; Lee et al., 2022; Pearson and Trompeter, 1994; Sagedal, 2023), and limitations on the locations where H-1B visa holders transitioning from student visas can work (Frost et al., 2024).

The objective of the monopoly is to maximize profits, or equivalently, to minimize costs by selecting the optimal location for an audit office (Lai and Tabuchi, 2012; Simunic, 1980). The cost can be expressed as:

$$\min_{x_M} TC_M = n(a - x_M)^2 + (1 - n)(x_M - 0)^2 + \int_0^1 (x_M - z)^2 dz \qquad (1)$$

In Equation (1), the first term represents the recruitment costs for staff auditors from the university located at point a, the second term represents the recruitment costs for staff auditors from the university located at point 0, and the third term represents the transportation costs associated with delivering the service to the clients. For the

second term, since the universities at positions 0 and 1 are of the same type, an audit office can choose to recruit staff auditors from the university that is closer. The notation "x" represents the location of the audit office. The notation "x" with the subscript "M" indicates the location of the monopoly audit office. It is assumed that providing overall service requires one group of staff auditors. Let "n" represents the percentage of staff auditors at an audit office who are recruited from the university located at point a. There is no distinction between staff auditors recruited from the universities located at points 0 or 1. Therefore, 1 – n represents the percentage of staff auditors who are recruited from the universities located at 0 or 1, which are closer to the location of the audit office.

Proposition 1

The optimal location of an audit office in a monopoly audit market is:

$$x_M = \frac{a}{2}n + \frac{1}{4}. \quad (2)$$

Proof of Proposition 1

The optimal location can be determined by taking the first derivative of Equation (1), with x_M set to 0.

Example 1

Based on Proposition 1, the optimal location of an audit office in a monopoly audit market is illustrated in Figures 2-4. In Figure 2, the university at location a is located at 0.5. If an audit office in a monopoly audit market requires more staff auditors from this university, an audit office will be located closer to the university at 0.5. In Figure 3, the university at location a is located at 0.25. If an audit office needs more staff auditors from this university, it will be positioned farther from the university at 0.25. The reason for this is that an audit office requires fewer staff

auditors from the university at 0, and positioning the office closer to 0.5 helps reduce transportation costs for service delivery. The closer the office is to clients, the more face-to-face interactions can take place (Beck et al., 2019; Chen et al., 2016; Francis et al., 2022). This approach aligns with existing literature on auditor-client proximity (Beck et al., 2019; Chen et al., 2016; Francis et al., 2022). In Figure 4, the university at location a is located at 0. If an audit office in a monopoly audit market needs more staff auditors from this university, the location of an audit office will remain unchanged. This is because both universities are located at 0, and there is no labor market pressure to influence the audit office's location.

[Insert Figures 2-4 here.]

3. The Basic Model of Duopoly in the Audit Market

In a duopoly, the market setting is largely similar to that of a monopoly audit market, except for the presence of two audit firms and the assumption that clients cover the transportation costs for service delivery (d'Aspremont et al., 1979; Hotelling, 1929; Lai and Tabuchi, 2012). In a duopoly, an indifferent client will choose a location based on the prices and transportation costs associated with each audit office, balancing the benefits of purchasing from one audit office over the other (Hotelling, 1929). In this context, x_0 refers to the location where the client is indifferent between purchasing from the first and second audit office. Therefore, the following equation should hold:

$$p_1 + (x_0 - x_{D1})^2 = p_2 + (x_0 - x_{D2})^2. \quad (3)$$

By solving Equation (3), the location of the indifferent client can be determined as:

$$x_0 = \frac{x_{D1}^2 - x_{D2}^2 + p_1 - p_2}{2(x_{D1} - x_{D2})}. \quad (4)$$

As the audit market is one example of Betrand competition, audit offices aim to maximize their profits by choosing their locations and then their pricing strategies (Hotelling, 1929). In the case of a duopoly, the notation "x" with subscript "D1" refers to the location of the first audit office, while "x" with subscript "D2" refers to the location of the second audit office.

$$\Pi_1 = \{p_1 - [n(a - x_{D1})^2 + (1 - n)(x_{D1} - 0)^2]\}x_0, \quad (5)$$

$$\Pi_2 = \{p_2 - [n(a - x_{D2})^2 + (1 - n)(1 - x_{D2})^2]\}(1 - x_0). \quad (6)$$

For the term multiplied by 1 – n, since the universities at positions 0 and 1 are of the same type, audit offices can choose to recruit staff auditors from the closer university.

Proposition 2

The optimal location of two audit offices in a duopoly audit market are:

$$x_{D1} = \frac{(8a + 4)n^2 - (20a + 8)n + 7}{32n - 56}, \quad (7)$$

$$x_{D2} = \frac{(8a - 12)n^2 - (20a - 60)n - 63}{32n - 56}. \quad (8)$$

Proof of Proposition 2

Using backward induction, the optimal prices should be determined before identifying the optimal locations of the two audit offices. Once Equation (4) is substituted into Equations (5) and (6), the optimal prices set by the two audit offices can be found by taking the first derivative of Equation (5) with p_1 set to 0 and the first derivative of Equation (6) with p_2 set to 0. The second-order conditions are met. Optimal prices are:

$$p_1 = \frac{3a^2 + 2(1 - a)x_{D2} - 4ax_{D1} - 1}{3}n + \frac{1}{3}(x_{D1} - 1)^2 + \frac{2}{3}x_{D2}^2, \quad (9)$$

$$p_2 = \frac{3a^2 + 4(1-a)x_{D2} - 2ax_{D1} - 2}{3} n + \frac{2}{3}(x_{D1} - 1)^2 + \frac{1}{3}x_{D2}^2. \qquad (10)$$

Then, the optimal prices are substituted into Equations (5) and (6), the optimal locations of the two audit offices can be determined by taking the first derivative of Equation (5) with x_1 set to 0 and the first derivative of Equation (6) with x_2 set to 0. The second-order conditions are met as well.

Example 2

Based on Proposition 2, the optimal location of audit offices in a duopoly audit market is illustrated in Figures 5-7. In Figure 5, the university at location a is located at 0.5. If both audit offices in the duopoly audit market require more staff auditors from this university, they will be located closer to the university at 0.5. The scenarios in Figures 6 and 7 follow a similar pattern to Figure 5. If the university at location a is located near zero, it will attract the second audit office more quickly. However, if the second audit office is located too close to the first one, a counteracting force from the audit market will push the first audit office away from the university at location a.

[Insert Figures 5-7 here.]

By substituting the optimal locations into Equation (8), we can compare the price of the first audit office for various locations of the university at location a. As shown in Figure 9, the price of the first audit office decreases more when it recruits more staff auditors from the university at location a, regardless of the university's location. Next, by substituting the optimal prices and locations into Equation (5), we can compare the profits of the first audit office for different university locations. Figure 9 illustrates that the profits of the first audit office decline more as it recruits more staff auditors from the university at location a, regardless of the university's location. Both price and profits decrease because as the two audit offices recruit more staff auditors

from the university at location a, they move closer to that university. The closer they move, the more intense the price competition becomes. As a result, the benefits from the labor market are offset by increased competition in the audit market. Future archival studies that aim to extend Lee et al. (2022) by examining the impact of audit office proximity to target schools on audit fees should also consider how competition within the audit market influences these fees.

[Insert Figures 8-9 here.]

4. Higher Labor Demand

Lee et al. (2022) found that audit offices located closer to targeted schools tend to exhibit higher audit quality, especially when labor demand is high. Ege et al. (2024) report a significant demand for public accountants from non-accounting firms. They suggest that accounting firms offering substantial salary increases before the busy season may help mitigate the negative impact on audit quality caused by job postings for public accountants during this period. In cases of higher labor demand, cost considerations differ between the labor market and the audit market. As a result, this study follows the approach of Lai and Tabuchi (2012) by assigning different weights to the recruitment costs of staff auditors and the transportation costs of the service.

In the following model, the notation "x" with subscript "k" represents a scenario where there are different weights applied to the recruitment costs of staff auditors and the transportation costs of the service. However, the recruitment costs of staff auditors from the university located at "a" are the same as those from the universities located at 0 or 1. By relaxing the assumption that cost considerations are constant across the labor market and the audit market, Equation (1) in monopoly audit market can be revised as follows:

$$\min_{x_{Mk}} TC_{Mk} = s[n(a - x_{Mk})^2 + (1-n)(x_{Mk} - 0)^2] + \int_0^1 (x_{Mk} - z)^2 dz \qquad (11)$$

In a duopoly audit market, Equation (3) remains the same, while Equations (5) and (6) should be revised as follows:

$$\Pi_{1k} = \{p_{1k} - ns(a - x_{D1k})^2 - (1-n)s(x_{D1k} - 0)^2\}x_0; \qquad (12)$$

$$\Pi_{2k} = \{p_{2k} - ns(a - x_{D2k})^2 - (1-n)s(1 - x_{D2k})^2\}(1 - x_0). \qquad (13)$$

Proposition 3

1. If cost considerations vary across the labor and audit markets, the optimal location of an audit office in a monopoly audit market is:

$$x_{Mk} = \frac{2ans + 1}{2(1+s)}. \qquad (13)$$

2. If cost considerations vary across the labor and audit markets, the optimal location of two audit offices in a duopoly audit market are:

$$x_{D1k} = \frac{4(2a+1)n(1-n)s^2 + 4[3a - (1-n)]s - 3}{(1+s)[3 + 4s(1-n)]}, \qquad (14)$$

$$x_{D2k} = \frac{4[4 + (2a-3)n](1-n)s^2 + 4[3an + 8(1-n)]s + 15}{(1+s)[3 + 4s(1-n)]}. \qquad (15)$$

Proof of Proposition 3

1. The optimal location can be determined by taking the first derivative of Equation (11), with x_{Mk} set to 0.

2. Using backward induction, the optimal prices should be determined before identifying the optimal locations of the two audit offices. Once Equation (4) is substituted into Equations (12) and (13), the optimal prices set by the two audit

offices can be found by taking the first derivative of Equation (12) with p_{1k} set to 0 and the first derivative of Equation (13) with p_{2k} set to 0. Then, the optimal prices are substituted into Equations (12) and (13), the optimal locations of the two audit offices can be determined by taking the first derivative of Equation (12) with x_{D1k} set to 0 and the first derivative of Equation (13) with x_{D2k} set to 0.

Example 3

Based on Proposition 3, the optimal location of an audit office in a monopoly audit market is shown in Figures 10-12. In Figures 10 and 11, if higher labor demand exists (s = 2 compared to s = 1) and an audit office requires more staff auditors from a university located at the border, an audit office will move much closer to the border. In Figure 11, if higher labor demand exists and an audit office needs more staff auditors from a university located at 0.25, an audit office will shift closer to that university. In Figure 12, where the university at location a is located at 0, the audit office's location remains unchanged, even if it requires more staff auditors from this university. The only difference is that with higher labor demand (s = 2 compared to s = 1), an audit office will be attracted to locate at 0, just like both universities.

[Insert Figures 10-12 here.]

Based on Proposition 3, the optimal location of audit offices in a duopoly audit market is shown in Figures 13-15. In these figures, if higher labor demand exists (s = 2 compared to s = 1), both audit offices will move much closer to each other.

[Insert Figures 13-15 here.]

5. Recruitment Costs Vary Across Different Universities

Compared to the past, students now have more options, and the number of offers may increase with their abilities. As a result, audit offices incur higher overall

recruitment costs or must offer higher wages if they want to hire more staff auditors with greater abilities (Teulings, 1995). Based on the approach of Lai and Tabuchi (2012), this study assigns different weights to the recruitment costs of staff auditors from various universities.

In the following model, the notation "x" with subscript "w" indicates a situation where there are different weights applied to the recruitment costs of staff auditors from the university at "a" compared to those from the universities located at 0 or 1. By relaxing the assumption that recruitment costs are constant across different universities, Equation (1) in the monopoly audit market can be revised as follows:

$$\min_{x_{Mw}} TC_{Mw} = nt(a - x_{Mw})^2 + (1-n)(x_{Mw} - 0)^2 + \int_0^1 (x_{Mw} - z)^2 dz \qquad (16)$$

In a duopoly audit market, Equation (3) remains the same, while Equations (5) and (6) should be revised as follows:

$$\Pi_{1w} = \{p_{1w} - nt(a - x_{D1w})^2 - (1-n)(x_{D1w} - 0)^2\}x_0; \qquad (17)$$

$$\Pi_{2w} = \{p_{2w} - nt(a - x_{D2w})^2 - (1-n)(1 - x_{D2w})^2\}(1 - x_0). \qquad (18)$$

Proposition 4

1. If recruitment costs vary across different universities, the optimal location of an audit office in a monopoly audit market is:

$$x_{Mw} = \frac{2atn + 1}{4 - 2(1-t)n}. \qquad (19)$$

2. If recruitment costs vary across different universities, the optimal location of two audit offices in a duopoly audit market are:

$$x_{D1w} = \frac{4(2a+1)tn^2 - 4(5at + t + 1)n + 7}{4(4n-7)(2-(1-t)n)}, \qquad (20)$$

$$x_{D2w} = \frac{4[(2a+1)t-4]n^2 - 4(5at+t-16)n - 63}{4(4n-7)(2-(1-t)n)}. \quad (21)$$

Proof of Proposition 4

1. The optimal location can be determined by taking the first derivative of Equation (16), with x_{Mw} set to 0.

2. Using backward induction, the optimal prices should be determined before identifying the optimal locations of the two audit offices. Once Equation (4) is substituted into Equations (17) and (18), the optimal prices set by the two audit offices can be found by taking the first derivative of Equation (17) with p_{1w} set to 0 and the first derivative of Equation (18) with p_{2w} set to 0. Then, the optimal prices are substituted into Equations (17) and (18), the optimal locations of the two audit offices can be determined by taking the first derivative of Equation (17) with x_{D1w} set to 0 and the first derivative of Equation (18) with x_{D2w} set to 0.

Example 4

Based on Proposition 4, the optimal location of an audit office in a monopoly audit market is illustrated in Figures 11-13. In these figures, higher recruitment costs (t = 2 compared to t = 1) associated with the university at location a, as opposed to a university at location 0 or 1, will increase the impact of the audit office's need for additional staff auditors from that university on its location. If the audit office prefers to recruit more staff auditors from the university at location a, these effects will be further strengthened.

[Insert Figures 16-18 here.]

Based on Proposition 4, the optimal location of audit offices in a duopoly audit market is illustrated in Figures 19-21. In these figures, similar to Figures 13-15, if higher recruitment costs (t = 2 compared to t = 1) are associated with the university at

location a, rather than with a university located at 0 or 1, both audit offices will move significantly closer to each other.

[Insert Figures 19-21 here.]

6. Conclusion

This study provides valuable insights into the optimal location decisions of audit offices, highlighting the significant role of labor market conditions, particularly proximity to universities, in shaping these decisions. The findings show that, in monopoly audit market, an audit office tends to be located closer to the universities from which it recruits staff auditors. In duopoly markets, both offices cluster closer together, with competition between the two leading to strategic adjustments in their locations. This clustering can decrease the profitability of both offices, as their proximity intensifies competitive pressures in the audit market. Additionally, higher labor demand and increased recruitment costs from universities further influence office locations, amplifying the effects of labor market forces. These results align with the findings of Lee et al. (2022).

The findings of Lee et al. (2022) are mainly driven by higher labor demand. This study extends their work by highlighting that the proximity of audit offices to universities is influenced not only by recruitment needs but also by competition within the audit market. Specifically, the analysis highlights the complex interaction between labor market conditions and the audit market, creating competing forces that shape the decisions regarding audit office locations. These findings open new avenues for future research, particularly in investigating the specific mechanisms through which the proximity between universities and audit offices, as well as the proximity between audit offices themselves, affects audit fees and the profitability of audit offices.

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Figure 1 Locations of three universities in a linear city

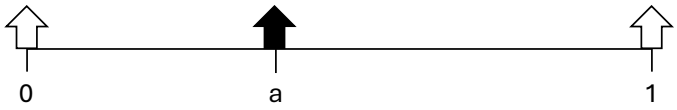

Figure 2 The optimal location of an audit office in a monopoly audit market (a = 0.5)

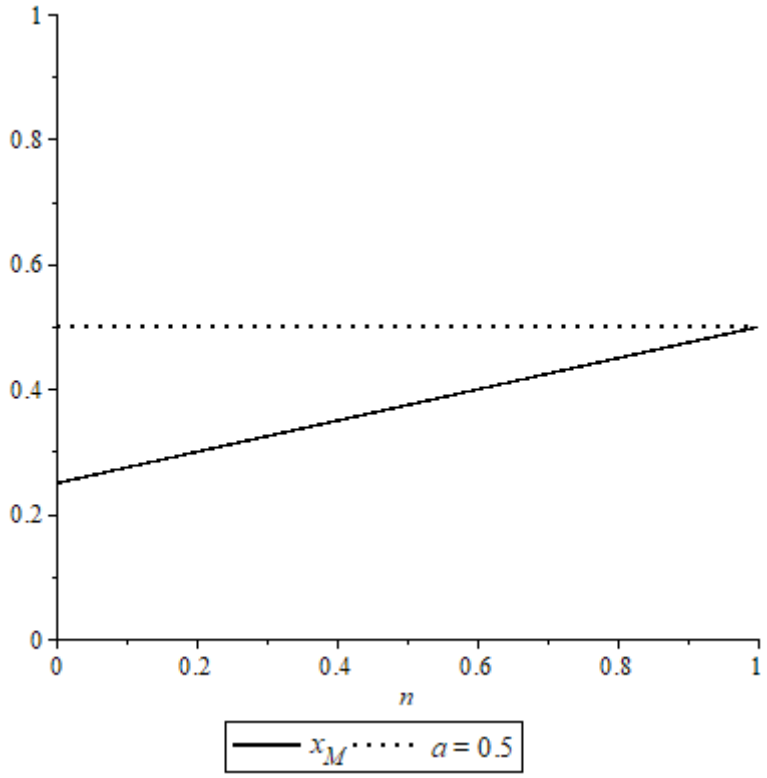

Figure 3 The optimal location of an audit office in a monopoly audit market (a = 0.25)

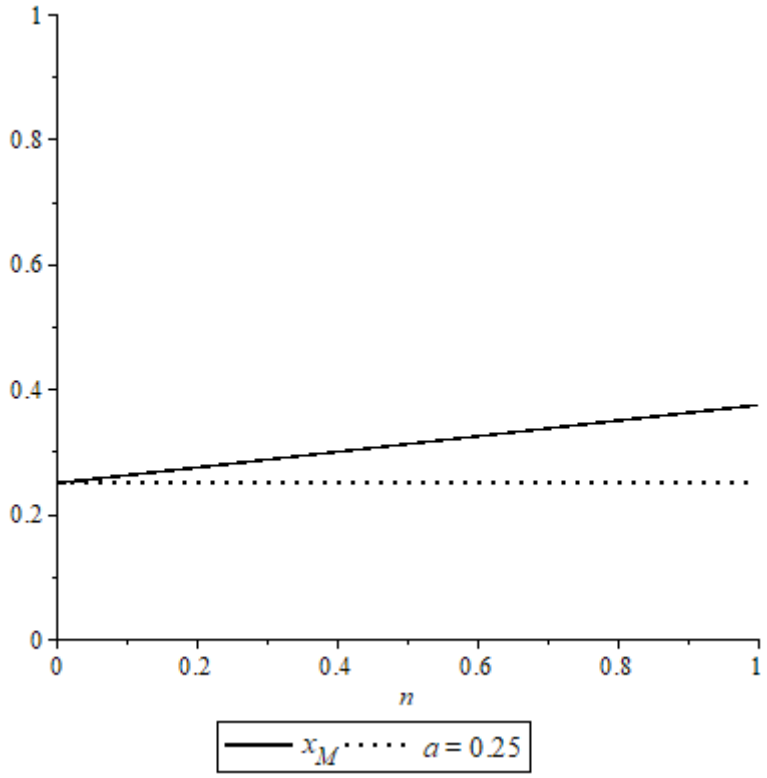

Figure 4 The optimal location of an audit office in a monopoly audit market (a = 0)

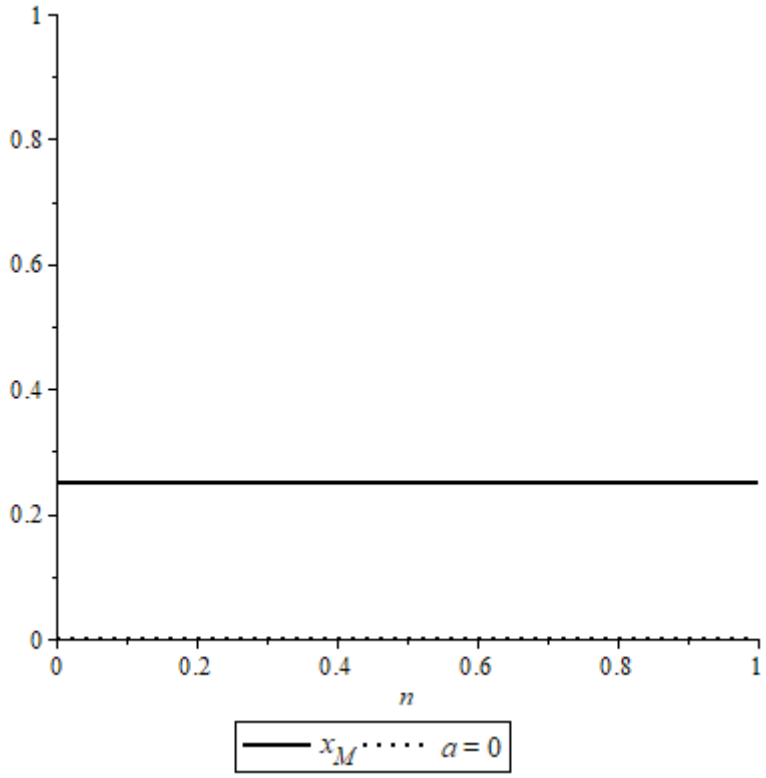

Figure 5 The optimal location of audit offices in a duopoly audit market (a = 0.5)

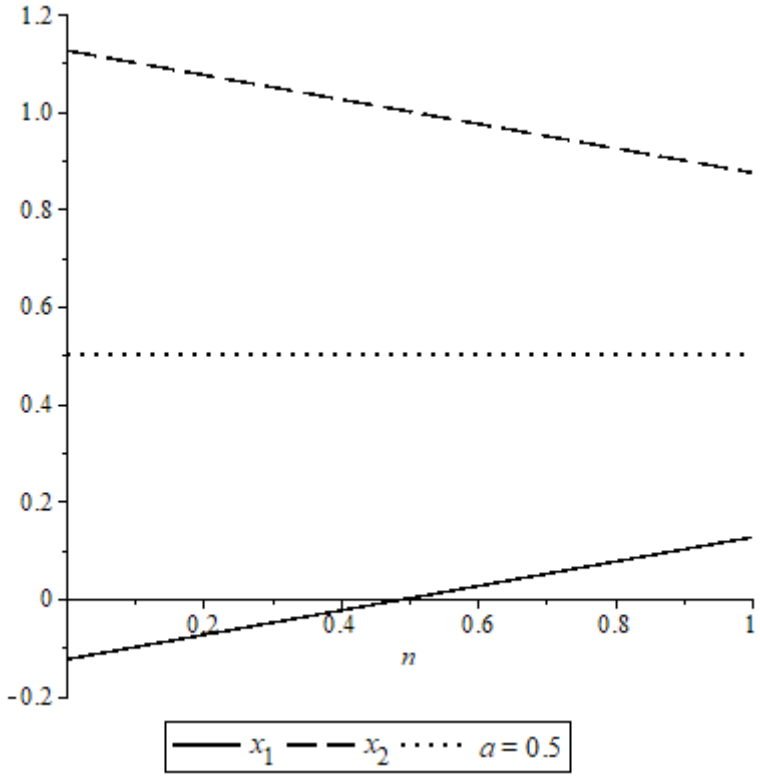

Figure 6 The optimal location of audit offices in a duopoly audit market (a = 0.25)

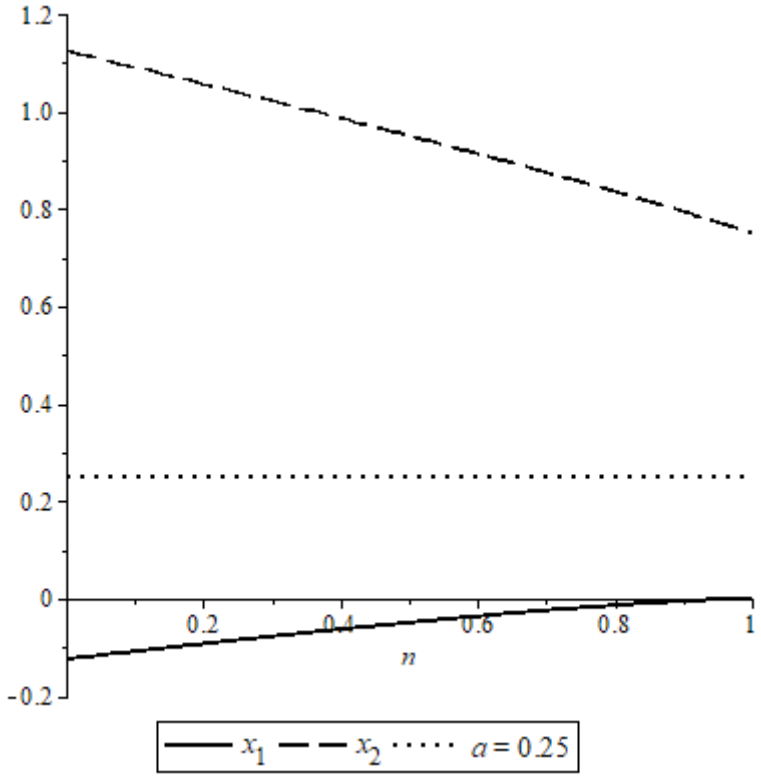

Figure 7 The optimal location of audit offices in a duopoly audit market (a = 0)

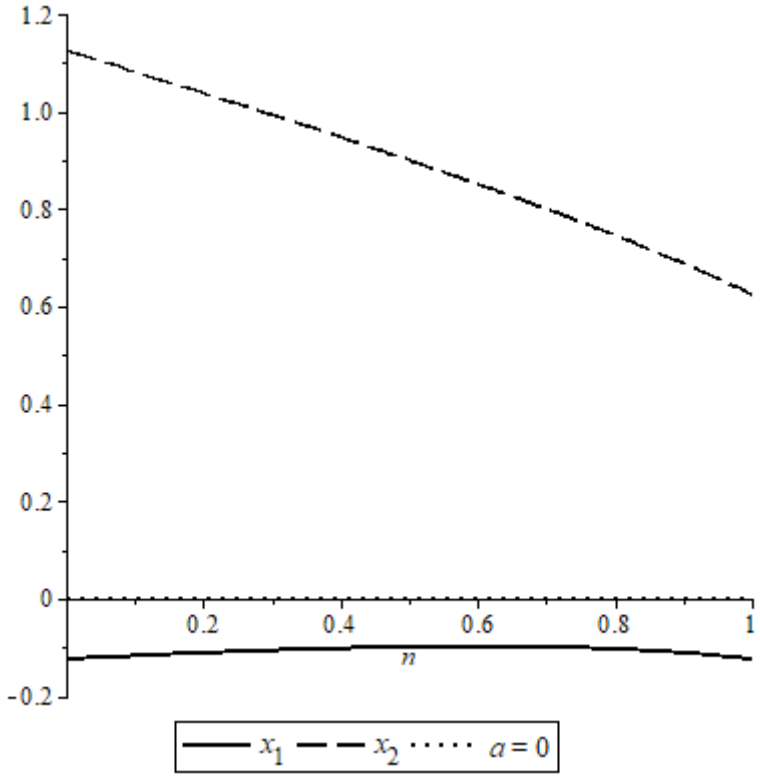

Figure 8 The price of the first audit office in a duopoly audit market

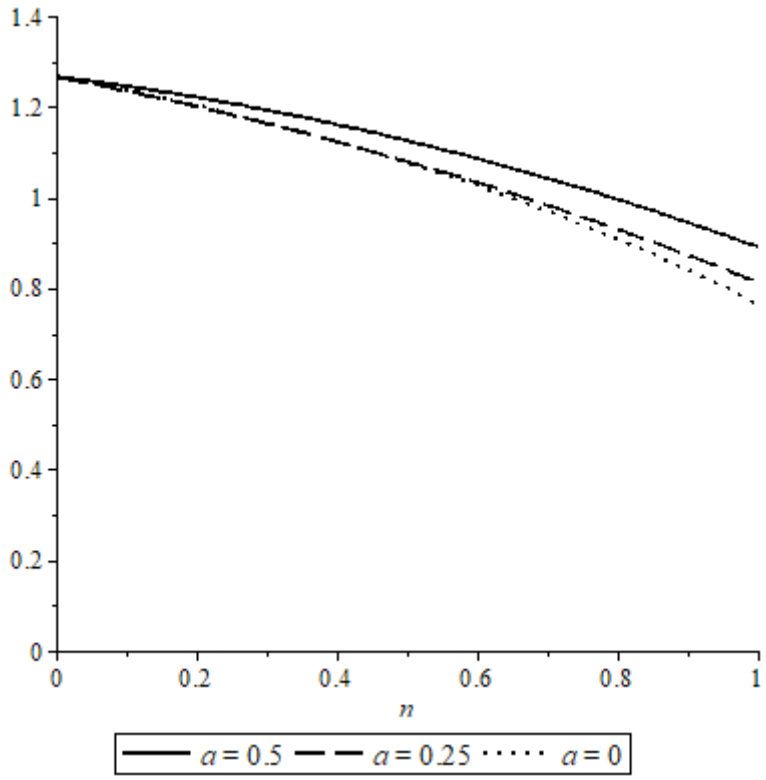

Figure 9 The profits of the first audit office in a duopoly audit market

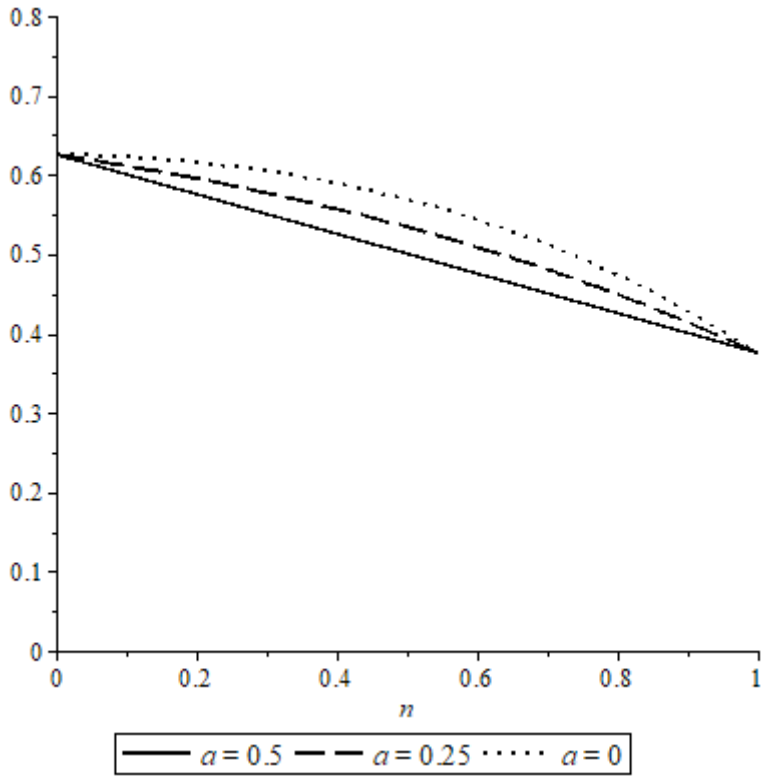

Figure 10 The optimal location of an audit office in a monopoly market with high labor demand (a = 0.5)

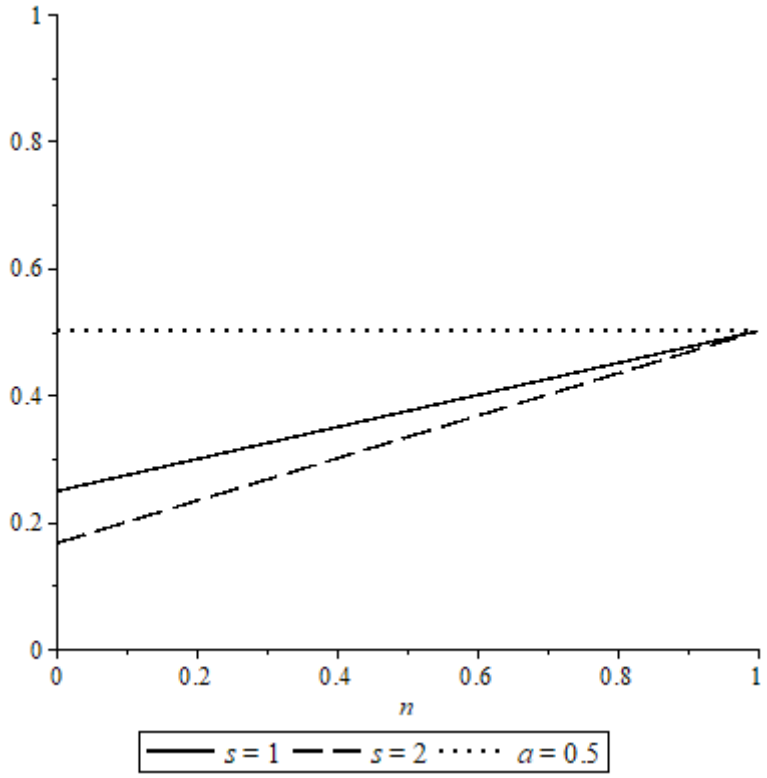

Figure 11 The optimal location of an audit office in a monopoly market with high labor demand (a = 0.25)

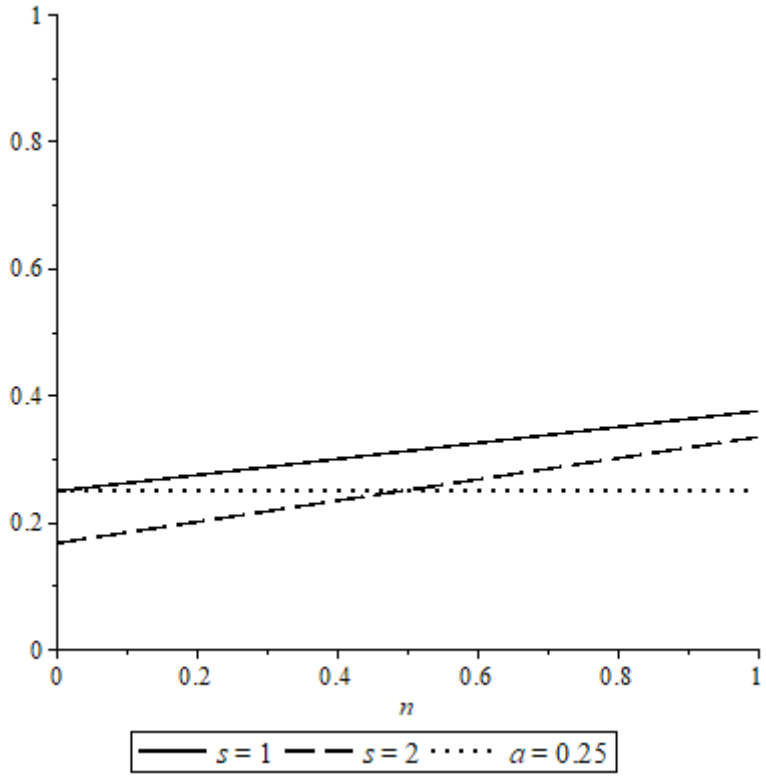

Figure 12 The optimal location of an audit office in a monopoly market with high labor demand (a = 0)

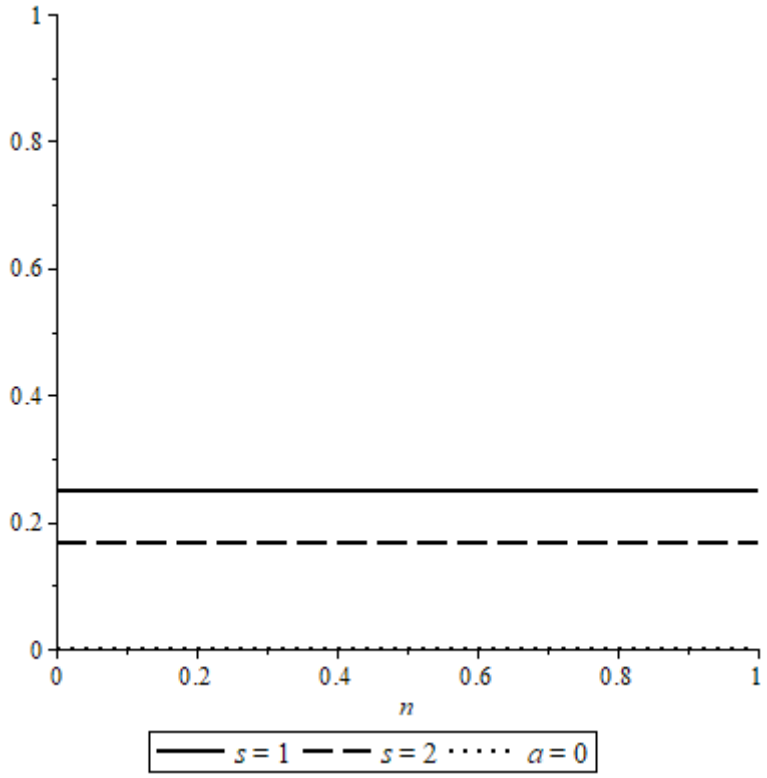

Figure 13 The optimal location of audit offices in a duopoly market with high labor demand (a = 0.5)

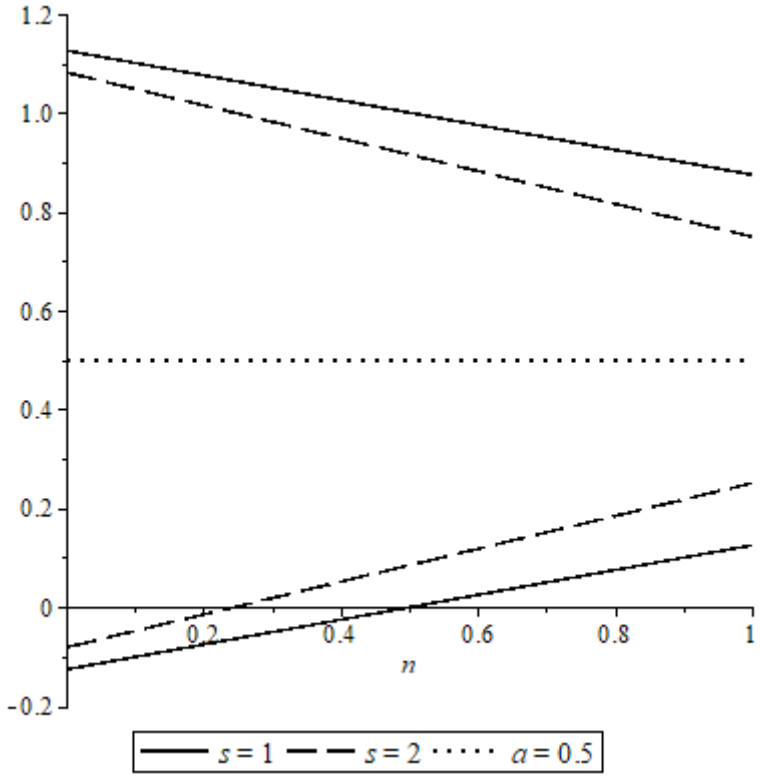

Figure 14 The optimal location of audit offices in a duopoly market with high labor demand (a = 0.25)

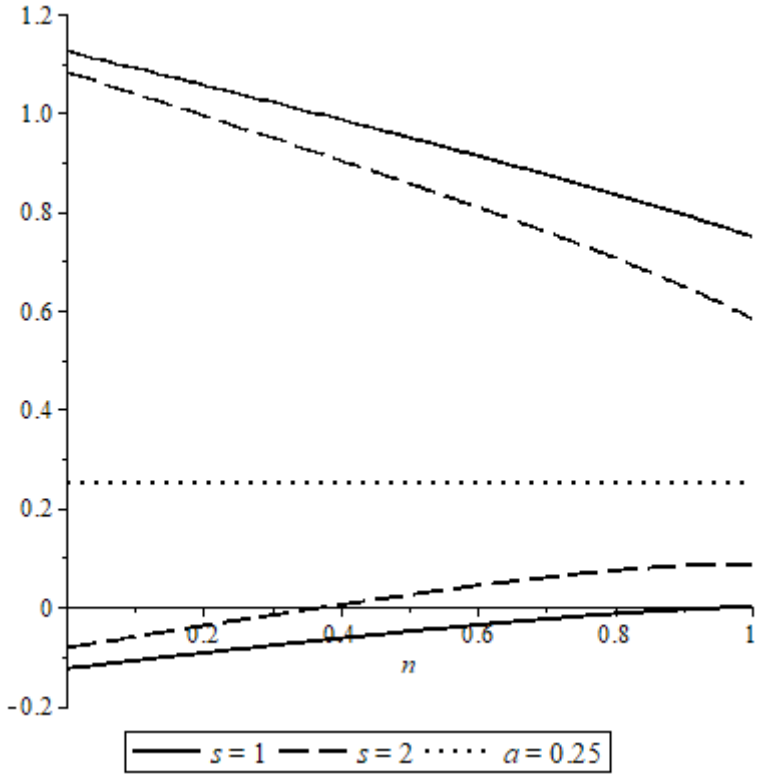

Figure 15 The optimal location of audit offices in a duopoly market with high labor demand (a = 0)

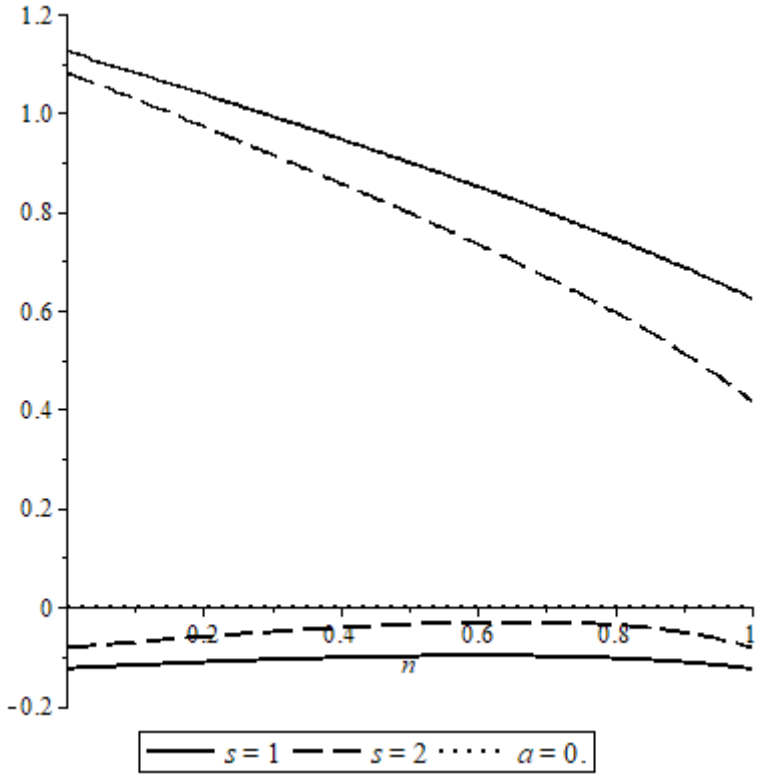

Figure 16 The optimal location of an audit office in a monopoly market with higher recruitment costs for graduates from the university at location a (a = 0.5)

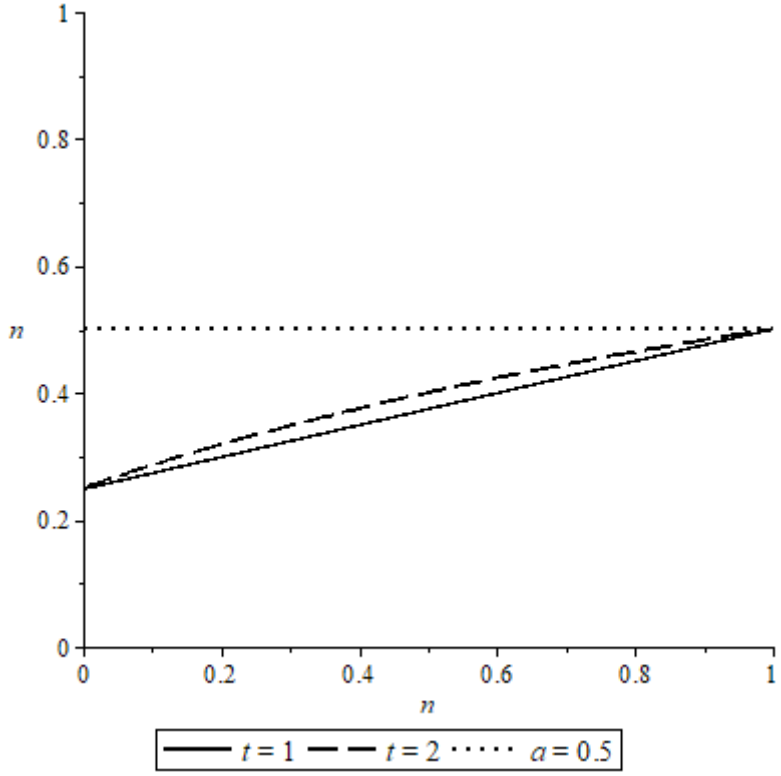

Figure 17 The optimal location of an audit office in a monopoly market with higher recruitment costs for graduates from the university at location a (a = 0.25)

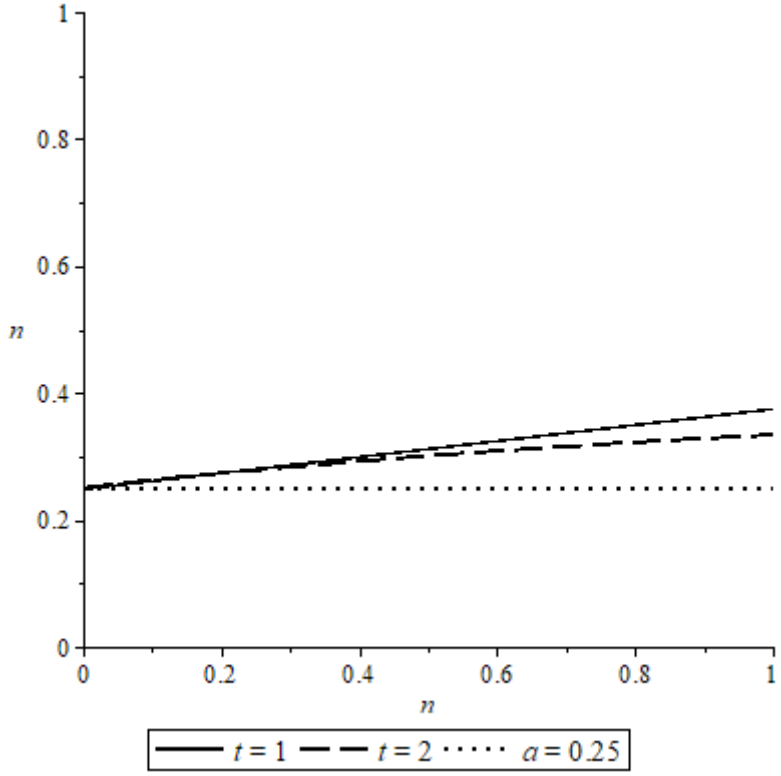

Figure 18 The optimal location of an audit office in a monopoly market with higher recruitment costs for graduates from the university at location a (a = 0)

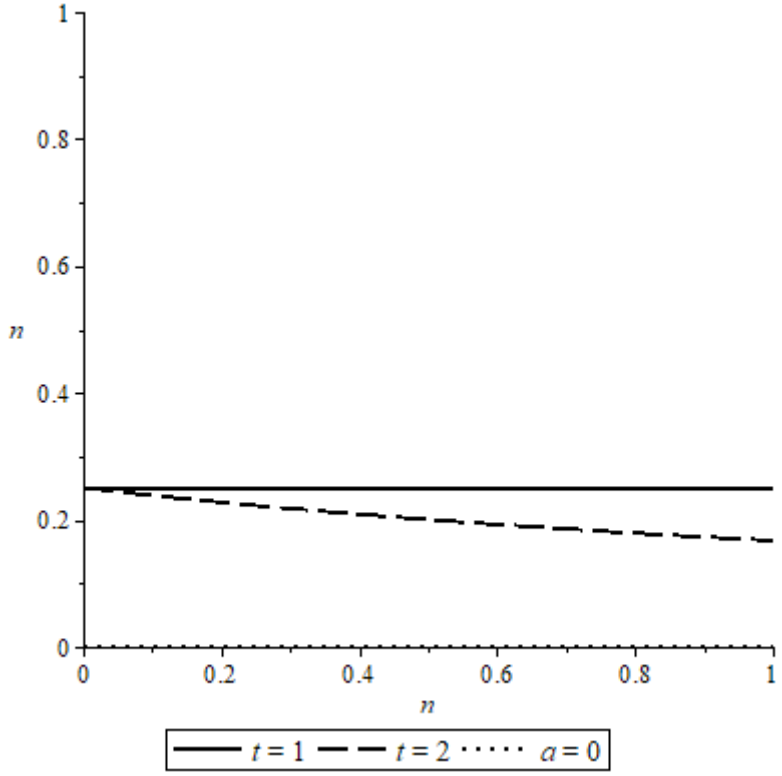

Figure 19 The optimal location of audit offices in a duopoly market with higher recruitment costs for graduates from the university at location a (a = 0.5)

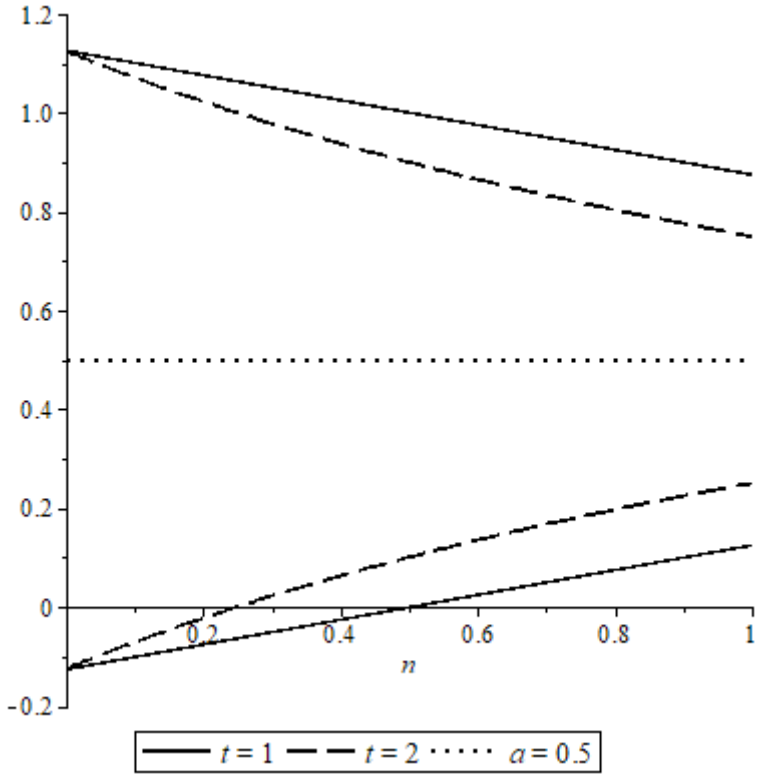

Figure 20 The optimal location of audit offices in a duopoly market with higher recruitment costs for graduates from the university at location a (a = 0.25)

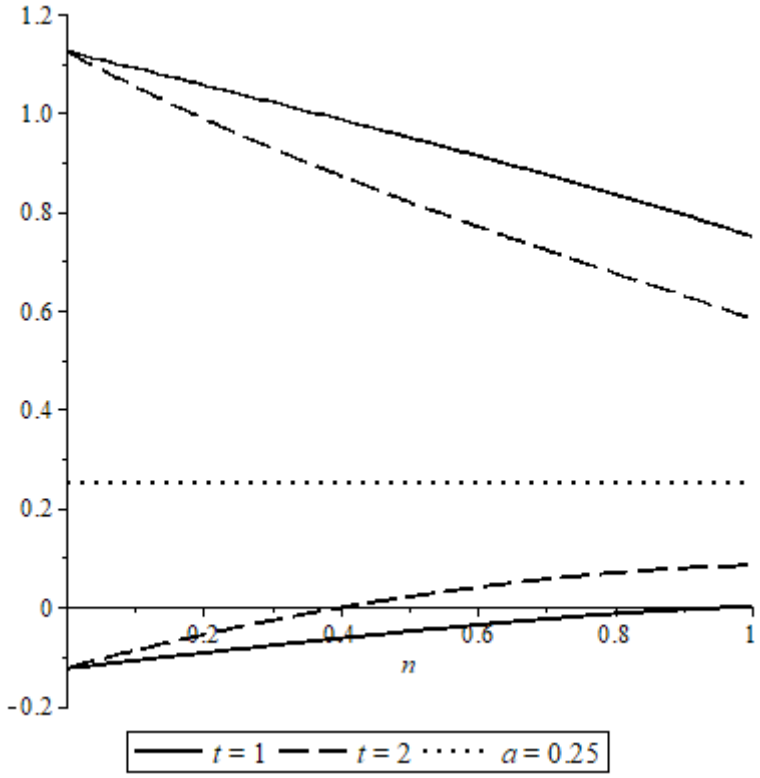

Figure 21 The optimal location of audit offices in a duopoly market with higher recruitment costs for graduates from the university at location a (a = 0)