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Audit Market Concentration for Listed Entities in the European Union and the Impact Following the Latest Audit Reform

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Abstract. *In 2014 the European Union (E.U.) released new directives with the aim of reforming the statutory audit market. One of the points addressed by this reform was the high market concentration, at least for public interest companies, and promoting competition within the market. Our paper seeks to examine the structure of the European Market for listed entities, before and after the E.U. Reform. The main purpose of our research is to analyze the market structure, the trends, the impact of the new mandatory requirements related to auditor rotation and the restrictions regarding the rendering of non-audit services has had on the audit market. The analysis focused on the exports, from Thomson Reuters Eikon, of listed companies, on the main markets, for all the countries which are E.U. members, for the period from 2012 to 2023. We collected the relevant data: auditor name and type, audit fees, audit related fees, also non audit fees to analyze the audit market structure, before and after the new audit directive, and the variations in the market regarding the fees for both audit and non-audit services. Our results showed that even though non-big4 auditors managed to increase their market share, when comparing the total number of companies, they did not manage to increase their market share when it came to percentage of total audit fees. This could be explained to some extent by charging lower audit fees to increase the number of clients or by attracting smaller clients which have lower fees and thus a limited impact on the overall value of the market. When it comes to non-audit services Non-Big4 auditors managed to increase their market share. This could have compensated for the lower fees and could prove useful if maintained in the medium-too long term.*

Keywords: audit market, auditor tenure, rotation, EU, market concentration, listed entities.

Introduction:

The financial crisis of 2007 brought to the public attention again the importance of promoting high quality standards of audits.

These aspects were addressed by the European Union (EU) with the issue, in 2014, of a set of new directives which were intended at reforming the statutory audit market. These directives are the Directive 2014/56/EU, which is the general framework, and the Audit Regulations (537/2014) which provide specific requirements applicable to Public Interest Institutions. The importance of such a special regulation which refers strictly to public interest entities is considered important due to the higher risk of possible negative consequences for these types of entities, when it comes to reporting errors for both shareholders and investors (Milieu, 2022).

As the high concentration of the audit market has always been an issue of debate the new audit reform introduced requirements with the aim of trying to promote competition in the audit market. Some of the main measures taken within this larger objective are the mandatory change of auditors after a period of a maximum of 10 years and the provision of restrictions regarding the rendering of non-audit services to clients. Regarding the increased market concentration, it was

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found in prior papers that this varies from 95% in Germany and 90% in Italy, to 64% in Poland (Milieu 2022) which shows significant variations among regions in Europe.

Our research seeks to analyze the audit market structure, for listed entities on the European Union main stock markets in each member country, at a centralized and regional level and both before and after the new audit directive came into effect in the year of 2016. As a result, we hope to better understand the market trends and the effects of the new audit reform, if any. For this purpose, we analyzed the market share when considering the number of companies, percentage of total audit fees and percentage of non-audit fees.

Our research involved a total of 2,565 companies listed on the main European Stock Markets (see. Appendix 1), for the period from 2012 to 2023. This resulted in a total number of 30,780 individual observations. Our findings present a decrease in the market share of Big4 auditors when it comes to the total number of clients however they managed to maintain remarkably high constant market share when it came to the percentage of total audit fees. The analysis regarding the market share related to non-audit services showed to improve in the favor of Non-Big4 auditors in the period following the implementation of the new audit reform. From an average of only 2% in the period prior to 2016 Non Big4 auditors increased to an average of 9% in the period after.

Literature review

The high concentration of the market for audit services has been a debated subject in scientific literature for several years as it increased in recent periods from 9 big audit firms in the 1970's to only four in the present times (Doogar and Easley, 1998).

Some of the reasons suggested by prior research, for such an elevated level of concentration refer in general to the higher perceived quality differentiation for large audit firms or as a result of economies of scale with regards to audit work. It was found, for example, that the larger the auditor and the smaller the clients, as a percentage of the auditor's total fees charged, there is less motivation for the auditor to behave opportunistically. As a result, it is considered that this would result in a perceived higher audit quality (DeANGELO, 1981).

Another research which analyzed the relationship between the competition in the auditor market and occurrence of financial restatements found that these are more likely to be noticed in metropolitan statistical areas which present high auditor competition, with the impact seen as being higher for Non-Big4 clients (Newton, Wang and Wilkins, 2013).

Also related to high market concentration a study focused on complex audit clients found that audit fees are increasing in concentration for clients where the barriers to entry by competing auditors are higher, due to client size, international operations, and IFRS use. Evidence was found that audit quality is decreasing in Big 4 market concentration for these types of engagements. (Gunn, J., Kawada, B., & Michas, P., 2019)

Another aspect of debate, which was taken into consideration by the European Commission when issuing the new audit directives, is the introduction of a rotation period for the auditors. Even though there are some researchers which state that this would help increase the quality of audits performed, their main argument being that the existence of a long client-auditor relationships might impair independence, there are others which argue that in fact longer periods, for audit services, would help increase the quality of the service due to a better understanding of the client as a result of the long relationship and customer knowledge gained through experience with the client.

A study examining the relationship between an audit client and their audit firm tenure noticed that shorter tenures of up to three years are associated with a lower level quality of financial reports when compared to medium and even long term audit tenures (Johnson, Khurana and Reynolds, 2002). Comparable results were also noticed by Blandon, Argiles-Bosch and Ravenda, 2020 in their paper. Their results showed that companies with audit tenures of more than 10 years do not show a lower quality of their audit services than other audit firms when compared. The results of their paper even suggest that there is noticeable evidence of a higher observed audit quality for these firms and therefore they question the necessity of setting a maximum audit tenure period.

In contrast however to these findings Montenegro, Meira and Silva, 2023 found in their study which focused on the Lisbon Stock exchange that mandatory audit firm rotation is related positively and significantly to a firms' performance in the market. They argue that investors seem to perceive the mandatory rotation of audit firms as a positive determinant of both audit and financial reporting quality.

In the author's opinion this aspect of higher quality and time of audit tenure is still a subject of debate. On the one hand we can argue of course that the longer the audit period, the more the risks faced by the client are known by the auditor and therefore their minimization can be achieved from one year to the next. As experience with the client increases the auditor becomes more aware of any changes and has more time available to analyze risks. There are, however, a vast number of audits performed yearly and if looked upon in general no indications of significant audit quality impact would be observed as audit failures, at least those significant, are limited in their occurrence. However, in some cases, these can be important and can have a significant impact on the market and stakeholders. Long audit relationships can bring risks which are difficult to spot in advance or evaluate. For example, a client-auditor close relationship developed over time and the reliance on prior period work. Also, two auditors may have different views or interpretation of risks and how they are assessed or addressed. It can be argued that, in some cases at least, a new fresh pair of eyes may provide a different point of view or interpretation which in turn may be beneficial. Even though there are ways to address these inside an organization, for example audit partner rotation, this is still a matter which requires further study. One may argue that to increase audit reports and financial statements credibility a user might expect that practices are in place to ensure proper independent review and that the risk associated with client- auditor close relationship is addressed. Encouraging a lower audit market concentration may prove beneficial in special situations where doubt would be cast on the work of one of the Big4 auditors. As they present a high percentage of the market any risks that would affect them might affect the market. Further studies are needed, however, to better understand the implications and the risk. Also, the small period since the new audit reform was implemented may not offer a sufficient period to perform a thorough analysis.

An empirical study related to mandatory rotation found however that evidence on how mandatory audit rotation impacts auditor independence, the auditor–client relationship, and audit market concentration is scant, whereas audit quality is the most investigated research question. Nonetheless, assessing whether mandatory audit rotation benefits audit quality remains challenging because the research outcomes depend on the research question, rotation type, research method, and regulations enforced in the empirical setting. (Florio C., 2024)

Continuing our opinion above, changing the auditor every 10 years may prove to have a positive impact on the quality of the statutory audit. Research prior to the directive showed that an independent audit report was similar to other audits regardless of the object of activity and the client's risks. The increase in the responsibility of the auditor, of the governance and management, of the audit committee, were distinct milestones for strengthening the credibility of the financial statements perfected by the quality of the statutory audit services.

Related to the limitation of non-audit services imposed by the new E.U. directives Horton, Tsipouridou and Wood 2018 in their study on the European market reaction to the new audit reforms introduced found results which are consistent with the investors expecting net benefits to be derived from the reform. Investigation related to this positive reaction, at both country and firm level, revealed however that investors did not appear to react significantly to the mandatory rotation proposals. However, they reacted positively and significantly (both statically and economically) to the restriction of non-audit services and capping of total fees. As a result, this seems to be a topic of more interest to investors.

In another study, focused on the Spanish Audit Market for listed entities, Basioudisa, Cuellar-Fernándezb and Garcia-Lacalleb 2024 found that, as expected due to the introduction of the maximum period for audit services, the new E.U. regulation has given rise to a significant increase in auditor changes. Their results, for the period from 2011 to 2018, showed that, when the auditor is changed, the incoming firm seems to offer a significant discount, related to audit fees, to the new client compared to the outgoing firm. This was found to be the case both before and after the introduction of the reform, and also it was noticed for both voluntary and mandatory switches after the reform. In addition, to the rotation for audit services, the reform has led to a reduction of the non-audit fees, which is especially noticeable after a voluntary audit firm switch. As a result they concluded that audit firms seem to be willing to take on the additional cost of auditing a new company to gain clients.

Considering the literature presented in the paragraphs above and the high interest noticed regarding the audit market concentration our paper focuses on analyzing the Audit Market for listed entities in the European Union to understand the evolution and if there was any change in the market structure following the latest E.U. Audit reform.

Methodology

To achieve the objective of analyzing the market structure we exported using Thomson Reuters Eikon the list of companies listed on the main stock exchange markets in each of the E.U. countries.

For these companies we also exported, for the period from 2012 to 2023, the data related to: Country, Company details (name, stock identifier), Stock Exchange Name, Auditor Code, Audit Fees Supplemental, Audit Related Fees Supplemental and the Non-audit to Audit Fees Ratio. To compute the value of the non-audit fees we multiplied the ratio by the total value of the Audit fees. As per Eikon, The Audit Fees- Supplemental *comprise of fees for professional services necessary to perform an audit or review in accordance with the standards of the Public Company Accounting Oversight Board, including services rendered for the audit of the Company's annual financial statements (including services incurred with rendering an opinion under Section 404 of the Sarbanes-Oxley Act of 2002) and review of quarterly financial statements;* while the Audit-Related Fees- Supplemental *comprise of fees for services that are reasonably related to the performance of the audit or review of the Company's financial statements and include: Support of business acquisition and divestiture activities, Independent assessment of controls related to outsourcing services, Accounting consultations, Internal control reviews not required by regulators, Debt issuance related services, Employee benefit plan audits and Certain attestation services as well as* *certain agreed upon procedures.* The non audit fees represent *other professional fees paid to the Auditor by the company not classified as audit, audit related fees or tax fees*.

Further on we categorized each auditor into two categories: 1 for Big4 auditors which includes Ernst & Young, KPMG, Price Waterhouse Coopers and Deloitte, and 0 for all others. We maintained from the data exported only those companies which had the auditor's name for at least 10 of the 12 years analyzed to reduce the number of estimations to an acceptable level. For the case where an auditor code was missing for one or two years we used the previous year's auditor as an estimate. As a result, a total number of 2,565 companies and a total of 30,780 individual variables were included in our final analysis. For these companies we analyzed the market concentration related to both the number of companies and the total percentage of the audit and non-audit fees.

Results and discussions

Our analysis showed that, when looking at the **number of companies** audited by Big4 vs Non-Big 4 auditors, a constant decrease of 1 percentage point per year is visible starting from 2019. The peak seems to have been in 2013-2014 when Big4 auditors accounted for 65% of the market. This was reduced to only 59% in 2023. One of the explanations for this change could be that it took some time for the reform, which came into effect in 2016, to influence the market. If we analyzed the period from 2012 to 2016 compared to the period from 2017 to 2023 we notice that the average market share of Big4 Auditors decreased from 64% to 62%. Please see **Table 1** and **Figure 1** below.

Table 1. Auditor type market share by number of companies

Auditor Type	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Non-Big4	36%	35%	35%	36%	36%	36%	36%	37%	38%	39%	40%	41%
Big4	64%	65%	65%	64%	64%	64%	64%	63%	62%	61%	60%	59%

Source: Authors own elaboration based on data collected from Thomson Reuters.

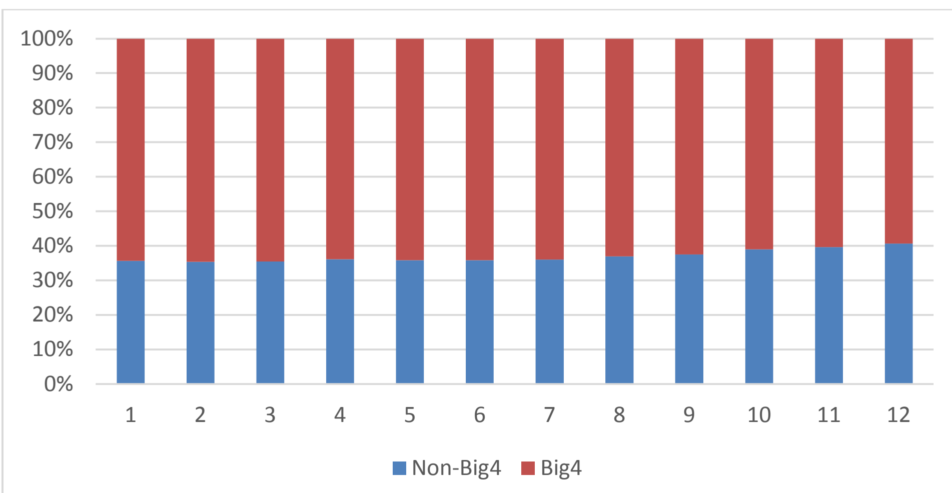

Figure 1. Auditor type market share by number of companies

Source: Authors own elaboration based on data collected from Thomson Reuters.

A further look at the market share by **region** reveals that in three regions there was a decrease in the market share of Big4 Companies, considering the **number of companies audited**. These varied with the eastern region showing the biggest drop from 38% average in the period up to 2016 to a 31% average in the period following 2016. It is followed by Western Europea with a 1.8 percentage points decrease in average market share between the two periods (from 58.5% to 56.7%) and Northern Europe with an average 1 percentage point decrease in market share between the two periods (from 94% to 93%). Southern Europe remained at the same average of 70% in both periods. When looking at the maximum and minim values we notice that the steepest decrease was in the Easter Europe region of 13 percentage points (maximum of 39% in 2015 to 26% in 2023), followed by Western Europe with a decrease of 6 percentage points (from 61% in 2012 to 55% in 2023), Southern Europe with 5 percentage points decrease (from 72% in 2018 to 67% in 2023) and Northern Europe with 4 percentage points decrease (from 95% in 2016 to 91% in 2023). Please see **Table 2** below.

Table 2. Auditors type regional market share by number of companies

Region/Auditor Type	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
East												
non Big4	65%	62%	62%	61%	62%	63%	65%	68%	70%	71%	73%	74%
Big4	35%	38%	38%	**39%**	38%	37%	35%	32%	30%	29%	27%	**26%**
North												
non Big4	7%	6%	6%	6%	5%	5%	6%	7%	6%	7%	8%	9%
Big4	93%	94%	94%	94%	**95%**	95%	94%	93%	94%	93%	92%	**91%**
South												
non Big4	31%	30%	30%	30%	29%	29%	28%	28%	29%	31%	32%	33%
Big4	69%	70%	70%	70%	71%	71%	**72%**	72%	71%	69%	68%	**67%**
West												
non Big4	39%	40%	41%	44%	43%	43%	42%	42%	43%	44%	44%	45%
Big4	**61%**	60%	59%	56%	57%	57%	58%	58%	57%	56%	56%	**55%**

Source: Authors own elaboration based on data collected from Thomson Reuters.

Looking further at the market share when considering the percentage of the **total audit fees** (audit fees and audit related fees) we have found that the market concentration is at a remarkably elevated level in favor of the Big4 auditors. When looking at the two periods, prior to 2016 and after, we notice that the average percentage of market share is constant 85% vs. 86%. A peak seems to have been reached in 2021. As a result, it seems that even though the market share, when measured by the total number of companies audited, seems to have been reduced for Big4 auditors they managed to maintain the market share when considering the total value of the fees.
Please see **Table 3 and Figure 2** below.

Table 3. Auditor type market share by % of audit fees

Auditor Type	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
non Big4	20%	11%	12%	15%	17%	14%	17%	17%	18%	4%	14%	16%
Big4	80%	89%	88%	85%	83%	86%	83%	83%	82%	96%	86%	84%

Source: Authors own elaboration based on data collected from Thomson Reuters.

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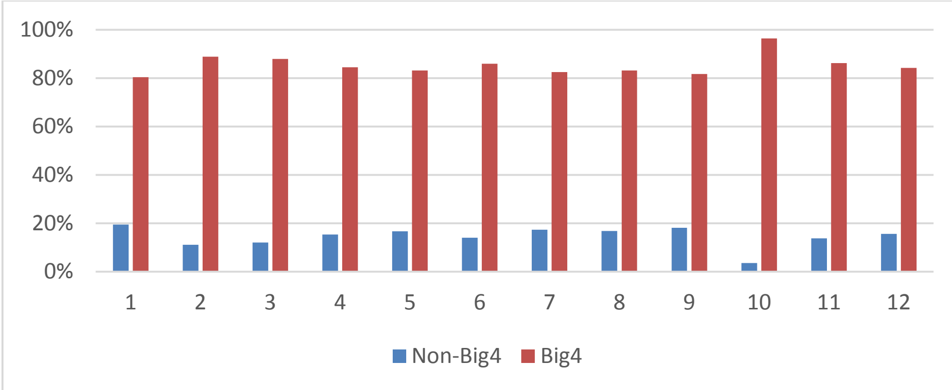

Figure 2. Auditor type market share by % of audit fees

Source: Authors own elaboration based on data collected from Thomson Reuters.

A further look at the market share by **region** reveals that, when considering the percentage of **audit fees** market share, a steep decrease in Big4 Market Share is visible only in the Eastern European Region. This decreased on average by 22 percentage points, from a 90% average in the period prior to 2016 to 68% average in the period following. The other regions remained constant on average between the two periods with variances being in the interval of 1 percentage point. Please see **Table 4** below.

Table 4. Auditors type regional market share by % of audit fees

Region/Auditor Type	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
East												
non Big4	4%	5%	10%	14%	17%	16%	14%	15%	52%	48%	15%	63%
Big4	96.0%	95.1%	90.2%	85.8%	82.6%	83.5%	85.9%	85.3%	47.6%	51.9%	85.0%	37.2%
North												
non Big4	0.4%	0.2%	0.3%	0.2%	0.2%	0.2%	0.4%	0.4%	0.4%	0.7%	0.7%	0.6%
Big4	99.6%	99.8%	99.7%	99.8%	99.8%	99.8%	99.6%	99.6%	99.6%	99.3%	99.3%	99.4%
South												
non Big4	2.1%	1.7%	2.3%	2.8%	3.2%	1.5%	1.4%	0.8%	0.9%	0.9%	1.1%	1.1%
Big4	97.9%	98.3%	97.7%	97.2%	96.8%	98.5%	98.6%	99.2%	99.1%	99.1%	98.9%	98.9%
West												
non Big4	26.3%	15.4%	17.9%	22.3%	24.0%	20.6%	25.3%	24.8%	25.4%	3.5%	21.0%	20.3%
Big4	73.7%	84.6%	82.1%	77.7%	76.0%	79.4%	74.7%	75.2%	74.6%	96.5%	79.0%	79.8%

Source: Authors own elaboration based on data collected from Thomson Reuters.

The analysis regarding the **non-audit fees**, fees paid to auditors not related to audit fees, and market concentrations showed us that Non Big4 auditors seem to have improved their market share constantly following 2016, the date the new directive came into effect. As presented in **Table 5 and Figure 3** below from a low of 2% in 2012 this increased to a high of 18% in 2023. From an average of only 2% in the period prior to 2016 Non Big4 auditors increased to an average of 9% in the period after.

Table 5. Auditor type market share non audit fees paid to auditors

Auditor Type	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
non Big4	2%	2%	4%	2%	1%	6%	7%	10%	9%	1%	13%	18%
Big4	98%	98%	96%	98%	99%	94%	93%	90%	91%	99%	87%	82%

Source: Authors own elaboration based on data collected from Thomson Reuters.

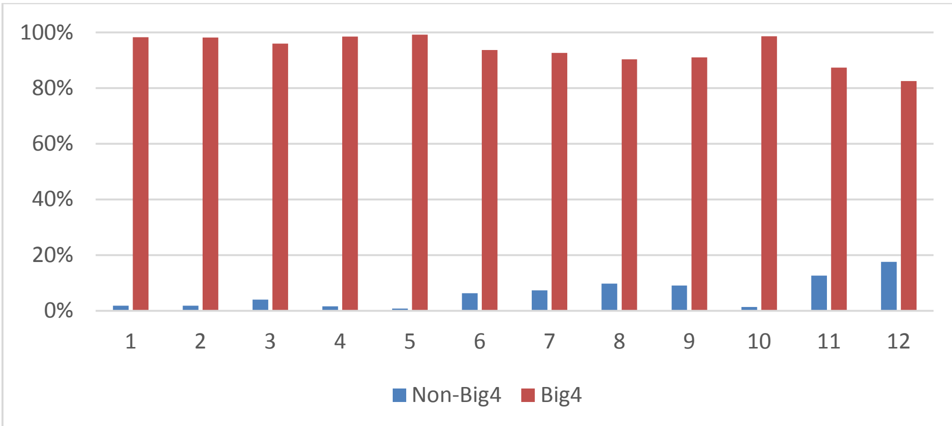

Figure 3. Auditor type market share non audit fees paid to auditors
Source: Authors own elaboration based on data collected from Thomson Reuters.

At the regional level we can see that the Big4 auditors lost market share, related to non-audit fees, in Eastern and Western Europe. In Eastern Europe, the average market share decreased by 16 percentage points, from 99% in the period prior to 2016 to 83% in the period after 2016, while in Western Europe their market share decreased by 12 percentage points, from 95% on average up to 2016 to 83% in the period after. Please see **Table 6** below.

Table 6. Auditor type market share non audit fees paid to auditors by region

Region/Auditor Type	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
East												
non Big4	0%	1%	3%	1%	0%	51%	0%	0%	0%	0%	3%	66%
Big4	100.0%	98.8%	97.5%	99.1%	100.0%	49.2%	100.0%	99.6%	99.8%	99.9%	96.6%	34.5%
North												
non Big4	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.3%	0.2%	0.1%	0.3%	0.1%
Big4	100.0%	100.0%	100.0%	100.0%	99.9%	100.0%	100.0%	99.7%	99.8%	99.9%	99.7%	99.9%
South												
non Big4	0.5%	0.7%	1.0%	0.5%	1.1%	0.9%	0.9%	0.2%	0.2%	0.1%	0.1%	0.1%
Big4	99.5%	99.3%	99.0%	99.5%	98.9%	99.1%	99.1%	99.8%	99.8%	99.9%	99.9%	99.9%
West												
non Big4	4.0%	3.6%	9.0%	7.0%	0.7%	10.8%	15.4%	17.8%	18.4%	1.4%	28.1%	27.9%
Big4	96.0%	96.4%	91.0%	93.0%	99.3%	89.2%	84.6%	82.2%	81.6%	98.6%	71.9%	72.1%

Source: Authors own elaboration based on data collected from Thomson Reuters.

Conclusion

The main objective of this paper was to analyze the evolution in the European Union Audit Market Structure, before and after the new audit reform which came into effect in 2016 and see if there was any noticeable impact in the market due the new requirements regarding auditor rotation and restrictions regarding non audit fees.

The data analyzed for the period from 2012 to 2023 showed that when looking at the **number of companies** audited by Big4 vs non-Big 4 auditors there was a peek in Big4 market share in 2013-2014 when big4 auditors accounted for 65% of the total market. This seems to have reduced to only 59% in 2023. A constant decrease is observable starting with 2019. This could be explained to some extent by the fact that the new audit reform was implemented in 2016 and as a result it took some time for auditors to reach the maximum threshold and for companies to start the tendering processes. On average we notice that the average market share of Big4 Auditors decreased from 64% to 62% in the period up to 2016 compared to the period after. It is interesting that there is a 1%-point decrease in every year starting with 2019 which implies that Non-Big4 auditors are increasing their market share constantly. We may assume that if this trend is maintained in the medium-too long term then it is possible that the new audit reform may meet its objective with respect to a lower concentration rate. When looking at the regional level it seems that Eastern Europe showed the highest decrease in Big4 Market share by 7 percentage points on average in the period prior to 2016 compared to the period after. This is followed by Western Europe however with only a 1.8 percentage points average decrease.

The results of the analysis regarding the market share, as a percentage of total **audit related fees,** showed that market concentration is at a remarkably elevated level in favor of the Big4 auditors. When looking at the two periods, prior to 2016 and after, we notice that the average percentage of market share is constant 85% vs. 86%. A peak of 95% seems to have been reached in 2021 which is after the new audit reform came into effect. We can conclude that even though the market share, when measured by the total number of companies audited, seems to have reduced for Big4 auditors they managed to maintain the market share when considering the total value of fees. Two of the possible explanations for this effect are that Big4 auditors maintained or even increased their audit fees therefore compensating for the loss in market share while Non-Big4 companies used lower fees to attract new customers and the other would be that the Big4 auditors managed to maintain the higher value customers with higher fees while losing on the smaller ones in favor of Non-Big4 auditors. Again, looking at the regions a steep decrease in Big4 Market Share is observed only in the Eastern European Region. This decreased on average by 22 percentage points, from a 90% average in the period prior to 2016 to 68% average in the period following. The other regions remained at a constant level. As the biggest companies and largest stock markets are in the Western, Northern and Southern Region this can explain the limited impact in the overall market share.

The analysis regarding the **non-audit fees**, fees paid to auditors not related to audit fees, and market concentrations showed us that Non Big4 auditors seem to have improved their market share constantly following 2016, the date the new directive came into effect. From a low of 2% in 2012 this increased to a high of 18% in 2023. From an average of only 2% in the period prior to 2016 Non Big4 auditors increased to an average of 9% in the period after. It seems that that this is one area where smaller auditors seem to have benefited. Additional revenues from this area may support further expansion of activity and compensate for lower audit fees offered for the main audit fees charged to companies. The increase may also be impacted by the caping of fees and restrictions regarding the services to be rendered imposed by the new regulations. As a result of the new limits Big4 auditors might have been forced to reduce the number of services rendered and as a result the reduction may be due to a lower quantity of services rendered. Further research is required to understand the reasons behind this increase and who benefited from the new restrictions imposed. At the regional level we found that Big4 auditors lost market share, related to non-audit fees, in Eastern and Western Europe. In Eastern Europe, the average market share decreased by 16 percentage points, from 99% in the period prior to 2016 to 83% in the period after 2016, while in Western Europe their market share decreased by 12 percentage points, from 95% on average up to 2016 to 83% in the period after. If maintained in the long term this could also help achieve the objective of the new audit reform related to market concentration by increasing the available resources, expertise, and visibility of the smaller auditors.

In conclusion, even though non-big4 auditors managed to increase their market share, when comparing the total number of clients, they did not manage to increase their market share when it came to the percentage of total audit fees. This could be explained to some extent by charging lower audit fees to increase the number of clients or by attracting smaller clients who have lower fees and thus a limited impact on the overall value of the market. The increase in non-audit services market share by Non-Big4 auditors, from an average of only 2% in the period prior to 2016 to an average of 9% in the period after, could have compensated for the lower fees and may prove useful if maintained in the medium too long term as it would increase resources, expertise and of course visibility in the market. As stated above further studies are needed however to understand the reasons for the decrease and the actual beneficiaries.

In the end we point out that there are limitations to our research from which we list the fact that data is not available or not complete for many companies in the market, there is a short time range from the implementation of the Audit Reform. Also, further research may be able to identify the suitable variables that could perhaps explain better how the auditor choice is influenced, the evolution in the market trend and if this could be maintained in the long term.

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Appendix

Appendix 1: List of Countries and Stock Markets Analyzed

Crt no	Country	Stock Market	Indicator
1	Austria	WIENER BOERSE AG AMTLICHER HANDEL (OFFICIAL MARKET)	WBAH
2	Belgium	EURONEXT - EURONEXT BRUSSELS	XBRU
3	Bulgaria	BULGARIAN STOCK EXCHANGE - MAIN MARKET	ZBUL
4	Croatia	ZAGREB STOCK EXCHANGE	XZAG
5	Cyprus	CYPRUS STOCK EXCHANGE	XCYS
6	Czech Republic	PRAGUE STOCK EXCHANGE	XPRA
7	Denmark	NASDAQ COPENHAGEN A/S	XCSE
8	Estonia	NASDAQ TALLINN AS	XTAL
9	Finland	NASDAQ HELSINKI LTD	XHEL
10	France	EURONEXT - EURONEXT PARIS	XPAR
11	Germany	XETRA	XETR
	Germany	DEUTSCHE BOERSE AG	XFRA
12	Greece	ATHENS EXCHANGE S.A. CASH MARKET	XATH
13	Hungary	BUDAPEST STOCK EXCHANGE	XBUD
14	Ireland; Republic of	IRISH STOCK EXCHANGE - ALL MARKET	XDUB
15	Italy	ELECTRONIC SHARE MARKET	MTAA
16	Latvia	NASDAQ RIGA AS	XRIS
17	Lithuania	AB NASDAQ VILNIUS	XLIT
18	Luxembourg	LUXEMBOURG STOCK EXCHANGE	XLUX
	Luxembourg	EURO MTF	EMTF
19	Malta	MALTA STOCK EXCHANGE	XMAL
20	Netherlands	EURONEXT - EURONEXT AMSTERDAM	XAMS
21	Poland	WARSAW STOCK EXCHANGE/EQUITIES/MAIN MARKET	XWAR
22	Portugal	OPERADOR DE MERCADO IBERICO DE ENERGIA - PORTUGAL	XLIS
23	Romania	SPOT REGULATED MARKET - BVB	XBSE
24	Slovak Republic	BRATISLAVA STOCK EXCHANGE	XBRA
25	Slovenia	LJUBLJANA STOCK EXCHANGE (OFFICIAL MARKET)	XLJU
26	Spain	BOLSA DE MADRID	XMAD
27	Sweden	NASDAQ STOCKHOLM AB	XSTO