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This paper focuses on audit markt concentration in Europe which is characterized by an oligopoly of "Big Four" audit firms. Hence a state of the art analysis of the status quo of concentration measurement has been conducted on the audit market from an European perspective. Thereby risks and causes of concentration development have been assessed along with the regulatory proposals of the European Commission (EC). After a discussion of conventional measurement methods of audit market concentration, our paper gives a review of previous empirical results of audit market concentration for several EU-member states and Switzerland. Results show that EC reforms cannot clearly be related to increase audit quality but increasing transaction costs.

Keywords: Audit Market Concentration, Big Four, Audit Quality, Corporate Governance, Empirical Audit Research, Audit Regulation

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INTRODUCTION

The audit market of publicly traded companies is highly concentrated in most European countries. The concentration of suppliers, characterized by the oligopoly of the so called "Big Four" audit firms (KPMG, PwC, Deloitte and Ernst & Young), entails among others the fact that in the long term small- and medium-sized companies are forced out of the market. The term "concentration" describes the agglomeration of economic power, which is present in many industrial sectors, having diverse causes (Moeller and Hoellbacher 2009). Concentration development is subject of discussion in economic research since more than 150 years, whereas concentration evidence on the market of legally required audits for publicly traded companies, which is the focus of our analysis, is from an empirical point of view only established globally since the 1960's. The concentration of suppliers on the audit market, to be determined with the help of empirical studies, must be assessed negatively from the point of view of competition policy, since

- the incentives to ensure cost efficiency and appropriate audit quality are decreasing,
- higher barriers of entry for small and medium-sized audit firms exist and
- a strong influence from the Big Four on the development of international accounting- and audit standards (IFRS and ISA) must be assumed.

Along with increasing supplier concentration, the market power of big audit firms is increasing, so that, as a result of collective market dominance, price arrangements between the Big Four audit companies are possible in the course of cartelization. This concentration can possibly cause an oligopolistic or monopolistic market structure. However, the present competition intensity depends on many parameters and not only on the number of suppliers and their individual market shares (Helmenstein, 1996), so that the connection between audit market concentration and competition remains unclear. The EC has classified in their current audit regulation drafts of 2011 (EC, 2011a and 2011b) the increasing supplier concentration at the European audit market as a serious threat. The risks related to a potential discontinuation of one of the big audit companies are pointed out. It is particularly feared that a lasting loss of trust into the quality of external audit could occur, which is a considerable part of stability of the financial system.

With this in mind, the EC searches in their audit regulation draft of 2011 for possible opportunities to revive the audit market and face the market concentration. This article carries out a state of the art analysis of the status quo of concentration measurement on the audit market from an European perspective. The investigation is structured as follows: First, the risks of concentration development along with the answer from the EC to this phenomenon are assessed (Section 1) followed by an analysis of causes of the concentration development (Section 2). Immediately following, the conventional measurement methods of audit market concentration are presented (Section 3) before the focus lies on the empirical review of previous results of audit research for several EU-member states and Switzerland. A critical conclusion along with future prospects completes the analysis (Section 5).

1. THEORETICAL FOUNDATION

The competitive situation at the audit market and the tendencies towards supplier concentration can be consolidated by numerous approaches used in industrial economics (Hachmeister, 2001). Here, explanations are searched for how the number of market players and their competitive interaction along with market imperfections, generated by offering heterogeneous products and services, and market entry barriers or asymmetric information influences the market behavior and the market structure. According to the structure conduct performance-paradigm, the market structure is, following the traditional version, determined by exogenous factors. Here, the industrial and competitive analysis by Porter (2008) is granted outstanding significance. The structure of the audit market is thus an essential factor of competitiveness for audit companies. According to Porter (2008), the market concentration can be interpreted as a strategic competitive advantage of an enterprise, provided that a higher additional benefit for the client is offered. This additional benefit of a basic product or service can be reducible to a lower bid price or an additional service with appropriate surcharge. In the recent past, the structure conduct performance-theory experienced a considerable advancement through the endogenization of cause variables of market structure. Hereby, among others, the game theory is important, which analyses the competitive interactions and effects of asymmetric information distribution and therefore considers interdependencies between market structure and market behavior. Within the scope of the transaction cost theory efforts are made to bring into focus the structures of authority and surveillance in companies and to clarify possible coordination problems. Last but not least, an economic analysis of the influence of legal environment on the market structure and market behavior is just as important.

DeAngelo (1981a) has first applied the size of an audit company as a surrogate for audit quality. According to that, big audit firms – measured by the number of clients – tend to be more independent of one specific client than medium-sized companies, which, as the case may be, have only few and for the total volume relevant clients and therefore could pursue incentives to satisfy the wishes of management to approve unrestrictedly, even when accounting errors were found (Marten, 1999). DeAngelo (1981a) explains her assessment with the existence of quasi-rents. The original inspection causes start up costs on the auditor and transaction cost on the client, which develops a bilateral monopoly. In a bilateral monopoly, both contracting parties are interested in a long-term perpetuation of their relations. From an auditor's point of view, a change of auditor would lead to a loss of client-specific quasi-rents, the companies to be audited would have to incur additional searching cost finding a new qualified auditor. Since big audit firms have more mandates than medium-sized firms and therefore a higher diversification of risk, according to DeAngelo (1981a) the probability increases that the auditor reports correctly about accounting errors and balance

sheet manipulation. The impending loss of quasi-rents of a client can easier be cushioned by other mandates on the lines of cross-subsidization and tends to lead to a lower financial dependency relating to one mandate. Especially the impending loss of reputation plays an important role for big audit firms, if capital markets assume a decreasing audit quality. Through this, not only the mandate in question could go astray, but additional ones on other national and international audit markets. Insofar, with increasing size of the audit firm, independence and demand increases as well from a capital market's point of view. As positive influence on trust building on the capital market can be the result of commissioning one of the big audit firms, management follows the trend and assigns preferably one of the Big Four.
As a follow-up study, Palmrose (1986) investigated the connection between audit firm size and audit fee. Hereby, it is assumed, that big audit firms demand a markup when owning a market position approaching that of a monopoly, in order to signalize higher audit quality. These hypotheses are contrary to low balling, after which audit firms agree with the client upon a not cost-covering audit fee in the first audit period hoping this would lead to future rationalization effects. Consequently, it is examined in addition whether the existence of economies of scale entails lower audit fees of audit companies in comparison to competition. Palmrose (1986) could prove that the "Big Eight" invoiced higher audit fees (price premium). This was said to be attributable to the higher audit quality or the monopolistic structures on the audit market. Besides, it could be confirmed that the Big Eight spend relatively more hours of work on a mandate comparable in scale.

2. Causes of Audit Market Concentration

The internationalization of financial accounting and audit along with the increasing number of mergers induced the fact that the audit market for capital market-oriented companies is served incrementally by big audit firms in Europe. The cause of this development is the search of globally acting enterprises for an auditor, who offers services on a comparable standard in the respective state of a subsidiary. The choice for one of the big audit firms is associated in literature with enhanced audit quality and reputation, with which in case of trust reinforcement on the capital market the firm value can be influenced positively (Rama and Read, 2006). Besides, the more stringent demands in terms of performing the audit of annual accounts, which are associated with compliance of IFRS and ISA along with the increasing regulatory obligation to report, can be accompanied by higher fixed cost and be decisive for supplier concentration (Quick and Sattler, 2011). From an European point of view, especially the 8th EC directive of 2006 is important which influences crucially the requirements in structural and procedural organization. Other causes for consolidation at the audit market are the involuntary retirement of audit firms, in- and external growth (mergers), the product differentiation being dominant in big audit companies, reputation building along with the investors' wish for a prompt publication of certified accounting (fast close).

3. Concentration measures

The measure of audit market concentration in previous empirical studies is characterized by heterogeneity. Using absolute (relative) concentration variables, the number (share) of certain audit companies on the whole market volume is considered. As absolute measures, the concentration rate (CR) and the Herfindahl-Hirschmann Index (HHI) are to be distinguished, while the Gini-coefficient (G) and the Lorenz curve are to be mentioned as relative measures (Quick and Sattler, 2011). CR measures the percentage of the entire reference amount that is allocated to the biggest audit firms (Big four, Big five etc.). Consequently, a CR4 = 0.6 implies, that the four biggest audit firms possess a total market share of 60% of mandates to be awarded. An oligopoly is present, if at most three audit companies have a market share of > 50% or at least five companies have a market share of > 66,6% respectively.

A monopoly position is assumed, if an audit firm has more than one third of total market share. The validity of CR is restricted by the arbitrary fixation of the number of largest carriers (Big four, Big five etc.), so that the additional use of HHI may be appropriate. It consists of the square of carriers' shares in the sum of characteristics and the subsequent summation of all carriers. That's why HHI ranks among the summary concentration measures, due to the fact that it provides a complete picture of market concentration. Owing to squaring market shares, the HHI is dominated by large audit companies and only insignificantly influenced by small carriers. In these premises, the use of HHI for measuring the concentration development of market dominating audit firms is reasonable. The following forms of HHI can be distinguished:

- a complete concentration is indicated with HHI = 1,
- in case of minimal concentration an equal share 1/n is allocated to each carrier (n),
- an unconcentrated market is assumed to exist if the value of HHI < 0.10 and a highly concentrated market is assumed to be present at a value of HHI < 0.18.

The reciprocal value of HHI is called Numbers Equivalent (NE) and is used partly in addition to other concentration measures in empirical studies. It specifies the number of audit firms with equal market share that correspond to a concrete market situation. To give an example, an HHI = 0.2 makes a situation palpable in which the entire audit market is equally divided up between five audit firms. The Lorenz curve as a relative measure variable (disparities) is not a concentration measure in a narrower sense it merely represents the frequency distribution in graphic form. The curve is named after Lorenz, who has already in 1905 depicted the income distribution this way. The carriers' accumulated percentages and the percentages of the sum of characteristics are compared to one another.
The deviation of resulting Lorenz curve fundamentally a monotonic increasing convex function of straight uniform distribution (diagonal) results in the concentration (Marten and Schultze, 1998). The more the Lorenz curve deviates downwards from the diagonal the more supplier concentration is increasing. The use of the Lorenz curve cannot be recommended for markets with only few company units, since for instance the existence of only two companies of same size indicates a concentration level of zero. Therefore, the Lorenz curve is suited for market share analysis of big audit firms only as a complement to other concentration measures (Grothe, 2005). After all, the relative concentration measure G indicates mathematically the area between Lorenz curve and straight uniform distribution relative to the triangular area underneath the half diagonal. The relative concentration therefore is the result of deviation from property values from a hypothetical uniform distribution of carriers:

- in case of a complete uniform distribution, G assumes the value of 0,
- in case of perfect concentration, the value comes close to 1,
- with G > 0.9 a very high concentration can be assumed,
- with G > 0.6 and <= 0.9 high concentration exists,
- market concentration is moderate if G is between 0.4 and 0.6.

Insofar, the choice of one or more of the different concentration measures depends on the respective goal of the study. In light of limited force of expression of one isolated factor based on possible bias, the use of several or all concentration measures is appropriate. Relevant are not only absolute but also relative measures, since the number and size of audit companies as well as the firms' differences in market share are within focus for further analysis.

4. Review of empirical Audit Market Research

4.1 Fundamentals

Concentration measurements for the audit market are recently the focus in empirical audit research from a national and international point of view. Studies are targeted at the analysis of market changes and effects on the competitive conditions for audit firms. By the potentially collective market dominance of big audit companies reduced competition can be evaluated based upon, among other factors, change of auditors quota and the extent of audit fees. Hereby, statistical considerations that choose a certain accounting year, and dynamic considerations that make chronological comparisons can be differentiated.
From a US-American point of view, concentration is often measured based on audit fees, while studies about the German audit market traditionally calculate approximately the market share with the help of the mandate numbers, balance sheet total and/or sales revenues of clients, since the publication of fees has only been obligatory since 2005. Insofar, there is only indirect connection to real audit fees. The assumption here is that audit fees have a positive association with balance sheet total and sales revenues. However, instead of a linear connection, a digressive correlation is assumed, whereupon the audits or rather the scope of audit fees increases in steady smaller growth rates along with an increase in company-size (Pong and Whittington, 1994). Even though with an increase in firm size the number of audit areas increases as well, an additional need for audit can be balanced out at least in parts primarily with the help of

- an audit approach oriented towards business risk (business risk audit),
- the review of risk management systems,
- the extension of analytical audits or,
- the greater use of sampling inspection,

so that a disproportionately low increase of audit fees becomes likely (Quick et al.,1998). Consequently, instead of the untransformed factors, the square root of balance sheet total or the square root of sales revenues is to be used. While the untransformed factors tend to overvalue concentration, transformed variables undervalue the concentration development. In empirical studies both factors are used as corridor values or rather intervals (Quick et al., 1998). The measurement of concentration based on client numbers is insufficient and only allowed as an auxiliary variable. Even though, numerous concentration measurements have been conducted recently from an European point of view, state of the art reviews tend to be found rarely, which summarize transnationally the respective results of empirical audit research concerning supplier concentration. While there is no review in German literature, Yardley et al. (1992) have analyzed the results of research on the US American audit market until the end of 1980's. In contrast, Walker/Johnson (1996) presented selected concentration studies on Australia, UK, New Zealand and Denmark. Insofar, an increasing need for research accrues in light of the EC regulation draft of 2011, which relates the increasing supplier concentration at the European audit market to a decrease in audit quality. Herewith, an increase in supplier concentration with essential impact on competitiveness of audit firms, the amount of audit fees as well as auditor independence is said to be associated. Resulting from the mergers of audit firms and the internationalization of accounting and auditing the supplier concentration is recognized as a global phenomenon (Gilling and Stanton, 1978), so that in the following the German audit market is included first, followed by other EU member states and Switzerland as a non-EU-member state. An enhanced research density is allocated to UK with regard to EU-member states. A transnational comparison of past studies is only possible within the scope of diverging assessment periods and objects as well as sample sizes, deviating legal systems and national accounting and auditing standards (Grothe, 2005).

4.2 Germany

Schruff (1973) presented the first study for the German audit market which covered the fiscal year 1967/68. According to this study, 78.9% of the audit firms cover just 10% of the audit market and the remaining 90% are served by 21.1% of the audit firms. The high concentration of providers is confirmed by the G-coefficient of 0.86. Schruff (1973) supposed that relatively few companies have a high testing volume and that these companies prefer just some few audit firms. The second study about provider concentration on the German audit market was conducted by Albach (1976) for the fiscal years 1951-1971.The increasing concentration is confirmed by the Lorenz curve and the G-coefficient [rise from 0.625 (1951) to 0.67 (1971)]. Albach (1976) assumed an increasing complexity of the testing mandates, which would require the selection of a large audit firm, as well as a decrease in the number of providers which is caused by the increased quality management within the audit firms. King (1976) proved as well a market dominance of few audit firms and a market share of less than 10% for individual auditors in the fiscal year 1973.

The concentration measurement for the German audit market was not continued before the mid-90s. According to Helmenstein (1996) an increase in concentration for the years 1987 and 1991 can be verified. While the HHI increase from 0.11 to 0.15, just a slightly increase about 0.01 up to 0.96 for the G can be assessed. In a follow-up study, Lenz (1996) conduct concentration measurements for the fiscal year 1990. KPMG and Coopers & Lybrand (C&L) were identified as market leaders whereby a reduced concentration process in comparison to the study of Schruff (1973) has been proven. As for CR4, an interval from 0.64 (transformed) to 0.82 (not transformed) is determined. Besides the Big Seven, the other audit firms have an underlying role.

This view was adopted in the years 1998/99 by the researches of Gloßner, Lenz, Lenz/Ostrowski, Marten/Schultze and Quick/Wolz/Seelbach. According to Gloßner (1998) and applied to the year 1995 and the balance sheet total, lower bottom lines of 0.46 (CR4) and 0.07 (HHI) can be assessed. The audit market is clarified as an oligopoly with a tendency towards a duopoly, whereby the concentration ratio are primary increased by the credit institutions and the insurance companies. However, Lenz (1998) and Lenz/Ostrowski (1999) can determine higher concentration ratios based on the transformed balance sheet total (CR4 = 0.73 resp. HHI = 0.19). Analogous to Gloßner (1998), the dominance of audit firms is especially illustrated by the audits of credit institutions and insurance companies. Marten/Schultze (1998) demonstrate again the market leadership of KPMG and C&L for 1990-94 with comparable high concentration ratios [CR4 = 0.66 (1994)]. The increasing market concentration is justified by mergers and changes of auditors to the Big Seven. Quick/Wolz/Seelbach (1998) and Quick/Wolz (1999) confirm this trend for the time period 1991-1994 [CR4 = 0.79 (1994)]. Analogous to Lenz (1996) a reduced concentration process exists.

The last studies which deal exclusively with surrogates of market shares are Hüllweck/Ostrowski, Strickmann, Lenz/Bauer and Grothe. The study of Hüllweck/Ostrowski (2000) demonstrated high ratios of concentration for 1996 and 1997 [CR4 = 0.84 (1997)] can be confirmed by Strickmann (2000) for 1989, 1993 and 1997 [CR 4 = 0.73 (1997)]. Thereafter approaches of a monopoly of the Big Four audit firms can be identified in some industries. Bauer (2004) and Lenz/Bauer (2004) observed for 2002 a concentration ratio of CR4 = 0.86 which exceeds the results of the previous study by Hüllweck/Ostrowski (2002). Moreover coherence between the stock index and the selection of a Big Four is derived. While PwC is identified as the market leader in the DAX and TecDAX, KPMG dominates the MDAX. However, balanced market shares can be found in the DAX. Likewise, Grothe (2005) proved an increasing concentration development on the German audit market for 1996, 1998 and 2000 [CR4 = 0.79 (2000)]. However, during the study period no trend towards

homogenization of the market shares within the oligopoly group during the study period is evident.
Just since 2005, the declaration of the (non) audit fees in the notes is mandatory in Germany. Moreover, audit firms which conduct audits for at minimum one public interest company, must state the (non) audit fees in a transparency report. Because of these disclosure reforms, current studies which include now directly the audit fees in the empirical research have a higher significance. According to Zimmermann (2008) and Bigus/Zimmermann (2008) who examine the fiscal year 2005, the Big Four audit firms, under the market leadership of PwC, collect approx. 87% of the audit fees resp. 90% of the total fees. Further, the consulting stake amounts to 41.9% of the final audit, which is higher than in the study by Lenz/Moeller/Hoehn (2006) (34%). The concentration ratio (CR4 = 0.85) is higher than the ratio in Switzerland and lower than in comparatistics from the USA and the UK. The fees for audits and services close to audits are, according to Bigus/Zimmermann (2008), 7.3% higher for SEC-issuers than for not SEC-quoted companies. Based on the one-periodic snapshot, the significance of these studies is limited.
In contrast, the empirical studies by Moeller/Hoellbacher, Koehler et. al. and also Sattler and Quick/Sattler are more important as they undertake time series analysis. Moeller/Hoellbacher (2009) examine a long time series (1997-2007) and conduct concentration measurements through the use of direct and indirect variables (audit fee, total balance sheet, sales revenue and number of mandates). Very high concentration measurement on the German audit market can be derived for the last reporting interval 2007 (CR4 = 0.97). KPMG and PwC have an average market share of 52% (audit assignment) resp. 86% (total balance sheet). Besides a slight increase for the concentration ratio over time can be determined. Koehler et. al. (2010), Sattler (2011) and Quick/Sattler (2011) examined the time period 2005-2007 and confirmed the results of Moeller/Hoellbacher (2009). Koehler et.al. (2010) proved a clear dominance of the Big Four [cumulative market share of 93% of the audit fees; CR4 = 0.93 (2007)]. Sattler (2011) and Quick/Sattler (2011) slightly lower concentration ratios [CR4 = 0.83 (2007)].
Since the first measurements, an overview manifests a high provider concentration on the German audit market and increasing development over the period of time as a permanent phenomenon, even for the last examined year 2007. On the German audit market, the supplier concentration can be classified as an oligopoly of the Big Four, where in certain industries or market segments even monopoly resp. duopoly structures are recognizable (Bigus and Zimmermann, 2008). However, the hypothesis, raised by the EC, that a high concentration is stringent related with restraints of competition, cannot be empirically confirmed. Rather, even in duo- or monopolistic market structures a high level of competition is possible. Indications on this can also be found in Germany, e.g. by increasing calls for tender of audit orders and aggressive marketing efforts of audit firms (Heer, 2001). Nevertheless the validity of the studies is limited, if only single years instead of time-series analyses are considered. Throughout the cited empirical examinations high resp. very high concentration results can be obtained. From a descriptive point of view it must be noted that KPMG and PwC (formerly C&L) have for many years the market leadership, while Deloitte and Ernst & Young, achieve much less market shares. In the cited studies, the market position of BDO as the largest non-Big Four company in Germany is classified as rather low (Quick and Sattler, 2011).

4.3 UK

Similar to the German audit market high rates for supplier concentration are derived in UK. In contrast to the German studies, the use of the Lorenz curve and G-coefficients for the exposition of the concentration development is omitted. Rather, CR and HHI are focused. A high density of research can be found for the UK audit market. The study of Briston/Kedslie (1985) includes a long time series analysis from 1928 to 1984. Here, a rise in the market share of the Big Eight from 28.7% to 46.2% between 1968 and 1978 can be observed. In 1984, CR4 is with 0.38, quite moderate. Subsequent to this, Moizer/Turley (1989) show for 1972 and 1982 the structural changes in the British audit market. Since the Companies Act 1967, UK has a disclosure requirement for the audit fees which can be used directly to measure market concentration. An increasing concentration can be determined for the study period (from 0.47 to 0.54). In addition, a significant reduction of audit firms from 144 to 85 companies can be assessed. As reasons for this development, the mergers of audit firms, the replacement of audit firms and the dwindling of joint audits are named. Moreover, a positive correlation between audit fees and supplier concentration can be found. Beattie/Fearnley (1994) state that the market shares for the Big Six is 72% in 1991. The increasing concentration process over time [from CR4 = 0.43 (1987) to 0.59 (1991)] can be explained with mergers of larger audit firms and auditor changes, whereby the large audit firms must pass comparatively less mandates to smaller audit firms. As one of just few studies, Pearson/Trompeter (1994) found for the years 1982-86 a negative correlation between supplier concentration and audit fees. The merger effects within the Big Eight on the audit fees are also in the focus by Iyer/Iyer (1996) for 1987-91, which found no substantial evidence for a relationship between concentration and audit fees. However, the increasing ratios of concentration over time (from CR4 = 0.45 to 0.57) can be justified analogical to previous studies of mergers of audit firms. Since the focus is solely on the 20 market leaders of audit firms for the period before and after the mergers, the validity is due to distorted findings (bias problem) limited. These results are, as already shown, in opposition to Pearson/Trompeter (1994). Peel (1997) can distinguish essential segment-specific differences for 1995 for the market shares within the Big Six (CR6 amounts to 0.78). Pong (1999) states only a slight increase in the concentration (from CR4 = 0.57 to 0.6) for 1991-95, since no mergers occur between firms in this period. The UK audit market is characterized as an oligopoly.

Also the Big Four consolidation due to the elimination of Arthur Andersen has a major influence on the market concentration in UK. Beattie/Goodacre/Fearnley (2003) examine that the Big Four have a market share of 90% (96%) in the period before (after) the collapse of Arthur Andersen in 2002. PwC is the market leader with 37% of all audit engagements. The Big Four concentration increases from 0.67 (2002) to 0.73 (2003). Also Pong/Burnett (2006) found an increase in 2001 (CR4 = 0.64) compared to 1997 (0.61). McMeeking/Peasnell/Pope (2007) prove a positive correlation between concentration and audit fees as well as between concentration and mergers of audit firms. The increase in the concentration ratios from CR4 = 0.65 (1985) to 0.83 (2002) is above average. Abidin/Beattie/Goodacre (2010) also determine for 1998-2003 an increasing concentration over time based on audit fees [CR4 = 0.88 (1998) and 0.96 (2003)], whereby the concentration ratio remains approximately constant on the basis of audit engagements. The omission of Arthur Andersen also leads to a greater balancing of the market share among the major audit firms.

4.4 Belgium

Also in other EU-member states like Belgium, the Netherlands, Denmark, Sweden and Spain, audit market concentration studies are increasingly conducted. Regarding the selection of variables for the measurement of the market share a high heterogeneity can be observed, although, in general the studies resort to only one variable.

For the Belgian audit market, Schaen/Maijoor (1997) can determine a positive correlation between the concentration ratios for the entire sample and the industry-specific concentration ratios for 1987. Not surprisingly, industry-specific differences for the concentration ratios in the range of CR4 = 0.22 to 0.78 can be found. According to Weets/Jegers (1997), the Belgian audit market show in comparison to other EU industrial member states lower concentration ratios for 1989 to 1995, wherein an rising trend from CR4 = 0.41 (1989) to 0.56 (1995) can be assessed. In an update of Willekens/Akhmadi (2003) for 1989 and 1997, a positive correlation between the market share of the audit firm and the audit fee is demonstrated, whence the authors derive an increased price competition.

4.5 The Netherlands

One of the longest international time series analysis stems from Maijoor et al. (1995), which covers the period from 1880 to 1990 in the Dutch audit market. First since 1970, a significant increase in concentration can be determined which is explained by growing regulatory standards and mergers. However, until the 1960s, very low and constant concentration ratios can be assessed for the Dutch audit market. Buijink/Maijoor/Meuwissen (1998), who put the years 1970 to 1994 as a basis, can identify a substantial increase of provider concentration between 1970-1973 and 1988-1991. Analogous to other international comparative studies, the mergers between audit firms is stated as a reason for the results. In a country comparison with Germany (CR4 = 0.16), the concentration ratios are significantly higher (CR4 = 0.52).

4.6 Scandinavia

Based on 1983, 1989 and 1990, a significant increase in the concentration ratios [CR4 = 0.543 (1989) and 0.705 (1990)] on the Danish audit market can be verified by Christiansen/Loft (1992) which is primarily explained with mergers. However, between 1983 and 1989 only minor deviations can be detected. The audit market is classified as a duopoly. According to Loft/Sjoefors (1993) an essential increase in the concentration ratios for 1983 and 1990 (Denmark) resp. 1985 and 1990 (Sweden) can be stated as well, whereby a dominance of two (Denmark) resp. three (Sweden) audit firms exist.

4.7 Spain

Spain entered the EU in 1986 and as a result the statutory audit requirements based on the 8th EC Directive began just in the end of the 1980s. Therefore the empirical audit research is in comparison to other named EU-countries of younger history. The first and only country-specific study of Romero et al. (1995) can determine a clear increase in the concentration for 250 companies in the period 1991-93. Since the implementation of the audit requirements, the dominance of the Big Six can be assessed. Their market share grows between the years 1991-93 from 83% to 95%.

4.8 Switzerland

In her study of market concentration in Switzerland, Heer (2001) can assess a high provider concentration as well as an increase over time for 1994, 1997 and 1998. Stefani (2006) proves a dominance of PwC (52.1%) towards Ernst & Young (24.5%) and KPMG (21.1%) for 2002. The concentration ratios tend to be higher than in comparable studies for the German audit market. The merger of PriceWaterhouse and C&L for PwC as well as the fusion between Arthur Andersen and Ernst & Young has not led to a significant increase of the absolute concentration (in terms of the balance sheet total). Stefani (2006) speculates that the external growth of the largest audit firms was balanced by the negative internal growth of the market leader PwC. Breitkreuz/Mueßig (2010) state, that the Swiss audit market is divided as well on the Big Three. Deloitte has a minor market share, while Ernst & Young, KPMG and PwC have over time a relative consistent market share of approximately 95%. The concentration ratios are over time relative stable.

4.9. Limitations

The critical points of the studies are that not in any case an appropriate sample size and length of the evaluation period was selected. Exceptions are the studies of Schaen/Maijoor (10.692), Beattie/Fearnley (2.079), Peel (171.799) relating to the sample size and relating to the evaluation period the studies of Briston/Kedslie (1928-1984) and Maijoor et al. (1880-1990).

5. CONCLUSION

In her regulation drafts of 2011, the EC indicated the risks of an increasing concentration on the European audit market. Small and medium sized audit firms are increasingly driven out from the audit of capital market oriented companies which leads to significant disadvantages of competition along with rising oligopolistic rents for the big audit firms. This paper predominantly focused on the current results of the empirical research on European concentration measurement. Since the initial measurement of Schruff (1973) in Germany, an increasing concentration development for the audits of listed companies on the European audit market can be proved. The empirical concentration measurement gained validity by the disclosure requirements for the (non) audit fees in the notes of the mandates as well as in the transparency reports of audit firms. As a result, a deduction of the market shares must not singly undertaken by surrogate figures (e.g. balance sheet total, sales revenue). The supplier concentration on the European audit market, which is reflected as an oligopolization of few big audit firms, is not a national phenomenon, but can be empirically demonstrated in many EU member states.

However, the valuation by the EC that a high audit market concentration must be connected with a restraint of competition, can often not proved empirically. Furthermore it is vague, how the EC reforms for a concentration decrease, e.g. the introduction of an mandatory audit firm rotation, are connected to an increased audit quality. Instead, significant increasing transaction costs could be related hereby which could without suppression of price dumping strategies (low balling) endanger the audit quality. Against this background, arise first of all a need to implement a minimum audit fee which should at least cover the individual costs of the audit firms.

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