



PwC's response to the Descriptive Statistics working paper

- 1 This is PwC's response to the Competition Commission's (CC) Descriptive statistics working paper. It sets out our outline views only, dealing with the:
 - Factual accuracy of the descriptive statistics; and
 - Interpretation of the descriptive statistics.

Factual accuracy of the descriptive statistics

- 2 The CC has helpfully provided us with the public dataset and the Stata "do files" that the CC has used to analyse this dataset. Using this information we have successfully verified all of the CC's descriptive statistics in relation to the public dataset, with the exception of Figure 6 (Change in real audit fee in the years after switching auditor).
- 3 Unfortunately we have been unable to reconcile the differences between our own and the CC's estimates in respect of Figure 6. However, the discrepancies are not large and they do not affect the direction of change in the audit fees in any year. Our view is therefore that the differences between our own and the CC's calculations are not material.

Interpretation of the descriptive statistics

Median or mean?

- 4 The range of audit fees paid by different FTSE 350 companies is exceptionally wide – the largest audit fee in the FTSE 350 is over 1,000 times the smallest. So too is the range of audit fee changes from year to year – there are examples in the dataset of price increases in excess of 1,000%.
- 5 Averages can be misleading when there is such wide variation. In particular, the mean of a distribution becomes very sensitive to individual outliers, particularly when sample sizes are relatively small. In our view it is more representative to present medians when estimating averages in this context.
- 6 We note that the CC has used medians when presenting audit fees (Figure 3). We consider this to be the correct approach. However, the CC appears to have used means when estimating changes in audit fee (Figure 6). Given the potentially distorting effect of outliers on the value of the mean, in our view it would be preferable to present medians in both instances.

Controlling for scope

- 7 The analysis of audit fees can be misleading if no control is included for changes in audit scope. Presumably to this end, the CC has presented descriptive statistics using audit fee divided by company turnover.



- 8 We welcome this attempt to control for scope but note that the use of company turnover in this way is far from perfect. There are three main concerns:
- (a) For some companies there is little correlation between audit scope and turnover. For these companies, there is often a high degree of correlation between audit scope and the company's assets;
 - (b) Where there is a correlation between audit fee and turnover, the increase in audit fees tends to be proportionately much less than the extent of higher turnover; and
 - (c) The ratio of the maximum to minimum values for this variable (audit fee divided by turnover) is very much greater than when the absolute level of audit fee is used.
- 9 The CC's approach of presenting both (i) audit fees and (ii) audit fees divided by company turnover should help a balanced analysis - the former tends to overstate the increase in audit fees (by not controlling for scope), while the latter tends to understate the increase in audit fees (by over-controlling for scope). The CC should be explicit about this.
- 10 Notwithstanding the above, it remains the case that simple descriptive statistics can be highly misleading. There are many factors that influence the audit fee (e.g. scope, complexity, risk, quality, regulation, and whether the company tenders its audit and/or switches auditor) and the range of values can be extremely wide. In these circumstances more sophisticated controls can be important through, for example, the use of econometric modelling.

Treatment of different situations

- 11 It is vital to recognise that tendering and switching occurs for different reasons in different contexts, and this needs to be interpreted carefully. The CC appears to recognise this in part. For example, in paragraph 16, the CC notes that it has excluded switches following the collapse of Arthur Andersen from its calculation of switching rates (although it does not explain why). Moreover, Figure 6 in the Working Paper suggests that prices fall by 19% following a switch. This analysis appears to include all switches other than those brought about by Arthur Andersen (but this is not completely clear).
- 12 We believe that a clearer and more rigorous approach is important to the analysis of how competition works in the sector. We have therefore classified switches and tenders into three categories:
- (a) "Direct switches" where a company has made a direct decision to change its auditor, generally following a tender, for reasons such as dissatisfaction with its existing auditor or corporate governance.
 - (b) "Consequential switches" where a company changes its auditor and where this decision is the consequence of another decision. The specific examples we consider are: (i) auditor switches following the demise of Arthur Andersen; and (ii) auditor switches following the company in question being taken over by another company that is not in the



dataset¹ (but where the original company remains in the dataset following the company takeover).

- (c) “Tenders without switches”. Strictly speaking these are not switches at all, but the competitive pressures that are brought to bear in these situations are very similar to those which arise with direct switches. We have included these situations in what follows, even though no actual switch occurs.
- 13 Annex 1 includes a list of all of the situations that we have included in each of these categories, together with information on:
- (a) The year in which the tender or switch took place.
 - (b) The real price change following the tender or switch (i.e. the percentage change in real audit fee in the year after the tender or switch as compared with the year before it).
 - (c) The median price change in each category.
- 14 The lists that are included in Annex 1 were compiled by:
- (a) Taking the list of actual switches identified from the public dataset.
 - (b) Using our market intelligence and judgment to identify which of these switches were brought about by the collapse of Arthur Andersen or by the company being taken over by an entity outside the dataset.
 - (c) Classifying those switches identified in (b) as consequential switches.
 - (d) Classifying all other switches as direct switches.
 - (e) Using our market intelligence and judgment to identify those situations where a company has carried out a tender but decided not to switch. These are referred to as tender no switch, and all are the non-switching counterparts of direct switches (i.e. none are associated with Arthur Andersen or company takeover activity).
- 15 In our view **switching rates** should be calculated on the basis of all direct and consequential switches. In other words, switching rates should include Arthur Andersen (contrary to the CC's suggestion) and takeover switches, as well as direct switches. This is because they are all switches where explicit decisions have been made that have resulted in a change in company auditor. Competitive pressures have been brought to bear on the audit firm in all of these situations - albeit for different reasons according to specific circumstance.
- 16 On the other hand, **price changes following a switch** should be assessed based on what is observed from direct switches and tenders without switches only:

¹ Generally an overseas entity.



- (a) In both of these circumstances, the company has voluntarily and directly decided to tender its audit without other factors influencing its tendering decision, and hence the resultant impacts on price can be analysed meaningfully as a single population.
- (b) Company takeover switches should be excluded from such an analysis because audit fees will generally be substantially reduced (post-switch) as the company requires a subsidiary rather than group audit. The switch is a consequence of corporate activity rather than a direct decision to tender the audit. The price change is driven primarily by scope change rather than the effects of competitive pressure exerted by a tender.
- (c) Switches that arose as a consequence of the demise of Arthur Andersen switches should also be excluded because of the unique nature of the situation: some companies might have used the situation to negotiate a particularly aggressive fee reduction, whilst others might have considered themselves to be in a weak bargaining situation given the speed and nature of the events that unfolded.
- (d) A consistent answer to the question of the price response to a tender, whether or not there is a subsequent switch, can only be obtained if consequential tenders driven by external factors such as the Andersen collapse and company takeover activity are excluded. This focuses the analysis on those tenders and switches that come about because of deliberate, voluntary and direct decisions by the company to tender and (in many cases) to switch.

Impact of switches

- 17 Our analysis shows that different types of tenders and switches have very different effects on price. Table 1 shows our estimates of the real price changes (i.e. the percentage change in real audit fee in the year after the switch as compared with the year before it) in each of the categories described above.



Table 1: Real change in audit fee after a tender or switch²

Sample	FTSE 350		
	Number ³	Median	Mean ⁴
Direct switches	78	-15%	-4%
Consequential switches – Takeovers	12	-30%	-1%
Consequential switches - Andersen	30	+3%	+6%
Tenders without switches	28	+3%	+81%
All switches	120	-3%	-1%
<i>All Switches (excluding Andersen)</i>	90	-16%	-3%
Direct switches + tenders without switches	106	-6%	+19%

- 18 The key points to note are that:
- (a) Direct switches result in an average immediate real price reduction of 15%;
 - (b) Consequential switches as a result of the company being taken over on average saw an immediate reduction in real price of 30%;
 - (c) Consequential switches as a result of the collapse of Arthur Andersen saw an immediate average real price increase of 3%; and
 - (d) Tenders without switch resulted in an average real price increase of 3%.
- 19 However, most importantly:
- (a) The closest match that we have to the CC's analysis shows that all switches (excluding those relating to the collapse of Arthur Andersen) results in a 15% immediate average real price reduction; but

² Note that: (a) data covers the period 2000 to 2011; (b) fees comprise audit and audit related fees; (c) fees are adjusted for inflation using the CPI; (d) we follow the CC's approach to classifying companies, i.e. companies are deemed to be FTSE 350 companies if they were in the FTSE 350 in the *third quarter* of the year in which a switch took place; and (e) we report means as well as medians in the interests of completeness.

³ The change in real fee could not be computed for all the switches and tenders we identified due to the absence of fee data for some companies either before or after the switch. Accordingly, the numbers of switches and tenders reported in the table are only the numbers for which we have data.

⁴ Analysis of the underlying data shows that there are some very large increases and decreases in fees for some companies. This illustrates that descriptive statistics are sensitive to outlying observations and other variables. For example, X tendered its audit and reappointed PwC. However, a significant acquisition in the same year substantially increased the scope of the audit, so any impact of the tender is masked by the substantial increase in scope.



- (b) We think this is not the correct measure to focus on because it wrongly includes switches associated with company takeovers and excludes tenders which did not result in a switch. The measure that we believe is most relevant in this context is the price impact of direct switches together with tenders without switches. Taken together, these result in an immediate average price reduction of 6% in real terms; and
- (c) All of these price impacts are transitory. We generally observe that prices revert toward their pre-switch (or pre-tender) price in subsequent years.

Audit fee / hour

- 20 While audit fee / hour statistics can be informative of pricing trends when looked at across the market, they need to be interpreted with care in the context of a switch in auditor.
- 21 For example, in situations where the audit fee and audit scope are unchanged following a switch of auditor, audit fee / hour would still be expected to fall initially as the incoming auditor typically has higher hours in year 1 of an audit (but does not charge all of these hours). However, as the auditor becomes more efficient and familiar with the company, hours will tend to fall and the audit fee / hour will tend to recover.

PricewaterhouseCoopers LLP

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Annex 1: “Switch” list by category

Technical notes

The following tables present the full set of underlying data used in our calculations of the median real fee change for different tender and switching categories, which are:

- Direct switches.
- Consequential switches (associated with either the company being taken over or the demise of Andersen).
- Tenders without switches.

The change in real fee could not be computed in all cases due to the absence of fee data for some companies either before or after the switch. These instances are listed at the bottom of each table as “N/A” and are not included in the calculation of the median real fee change. The median observation(s) in each population is/are shaded in grey. Where there is an even number of observations, two are shaded in grey and Table 1 in the main text takes the midpoint between these two observations.

The year indicated is the variable ‘cy’ (calendar year) from the public dataset and corresponds to the calendar year in which the majority of that financial year fell for that company.

The real fee change is calculated based on the change in real fee, where *real fees* are the ‘total audit and audit-related fees’ adjusted for inflation using the Consumer Price Index.



Direct switches ✂

Company

Year

Real fee
change

✂

✂

✂



Consequential switches – Takeovers ✂

Company	Year	Real fee change
✂	✂	✂



Consequential switches – Andersen ✂

Company	Year	Real fee change
✂	✂	✂



Tenders without switches ✂

Company	Year	Real fee change
✂	✂	✂



All switches ✂

Company

Year

Real fee
change

✂

✂

✂



All switches excluding Andersen ✂

Company	Year	Real fee change
✂	✂	✂



Direct switches plus tenders without switches ✂

Company	Year	Real fee change
✂	✂	✂