

## **On- and off-book trading**

1. In this appendix we summarize some of the elements of the analysis that we conducted to assess the constraint imposed by off-book alternatives to on-book trading. These are:
  - (a) trends in on-book and off-book trading over time;
  - (b) questionnaire responses and follow up calls with trading firms; and
  - (c) LSE's internal papers and board minutes from the strategic fee review group.

### **Trends in on-book and off-book trading over time**

2. LSE provided us with data on trading activity both on-book and off-book over time. The latter includes only trading that is conducted off-book, but reported to LSE, and does not include trading that is off-book and not reported to LSE. There is no available data concerning off-book trading that is not reported to LSE.
3. LSE made two points in relation to these data. Firstly, other than trading fees, there are factors, both internal and external, that affected trading over this period. Internal factors included, for example, the introduction of a CCP on the SETS order book in 2001, making trading on-book more attractive. External factors included the development of statistical arbitrage and DMA trading (technical trading), particularly from 2003, which increased trading on-book. LSE stated that given the large number of different factors—many of which are not quantifiable—driving both the overall level of equities trading activity and the choice of execution venue by customers over the period, it was extremely difficult to isolate the impact of LSE's trading fees on order book trading. It said that, in the light of this, considerable caution should be exercised in attempting to draw inferences from the data regarding the sensitivity of order book volumes to trading fees. Secondly, LSE noted that the level of technical trading within

the market is the key driver of the sensitivity of order book volumes to trading fees and the virtuous circle. Since technical trading developed much more quickly from 2003 onwards, one should be even more cautious about drawing inferences from data prior to this. LSE concluded that because of the number of external factors affecting trading and the recent trends in statistical trading, these trends cannot demonstrate any correlation between the two forms of trading. We agreed that caution needs to be exercised when analysing the data.

4. The following discusses historical trends in the data series and, after this, reports on our analysis of the data. Figure 1 shows the series for on- and off-book value of shares traded and Figure 2 shows the same but for the number of trades. In these figures we note when LSE has implemented fee changes. Details of these fee changes can be found in Table 1.
  
5. We inspected these trends visually. We first considered the set of price changes which took place in April 2001. Figure 1 shows that, following the April 2001 fee changes, when the fee for on-book trading increased and the structure of off-book fees was also changed (see Table 1), the value of on-book trades was broadly constant, but the value of off-book trades fell. The trends for this period (April 2001 to April 2003) appear to be inconsistent with the fee changes, although other factors, such as the introduction of the CCP in February 2001, may have had an impact. Figure 2 shows similar rising trends before the April 2001 fee change, after which the volume of on-book trading continued to rise, but the volume of off-book trading fell. As with Figure 1, the trends in Figure 2 appear to be inconsistent with the fee changes. In considering the trends in Figure 2, it is important to note that the average value per trade for on-book trading decreased significantly from around the end of 2000, whilst the average value per trade for off-book trading increased. Secondly we considered the two other fee changes, which took place in April 2003 and 2004. For

these price changes the trends in Figures 1 and 2 do not display any switching, although again other factors such as the increased importance of technical trading may have influenced some of these trends. Overall these data do not show evidence of switching between trading on and off-book due to the fee changes.

6. We tested whether there was any statistically significant relationship between the fee changes and the changes in volume and average value of trade. We did not find any evidence of switching behaviour.
7. In sum, we could not see evidence of switching between trading on and off-book due to fee changes.

FIGURE 1

On- and off-book value of trades (£m)

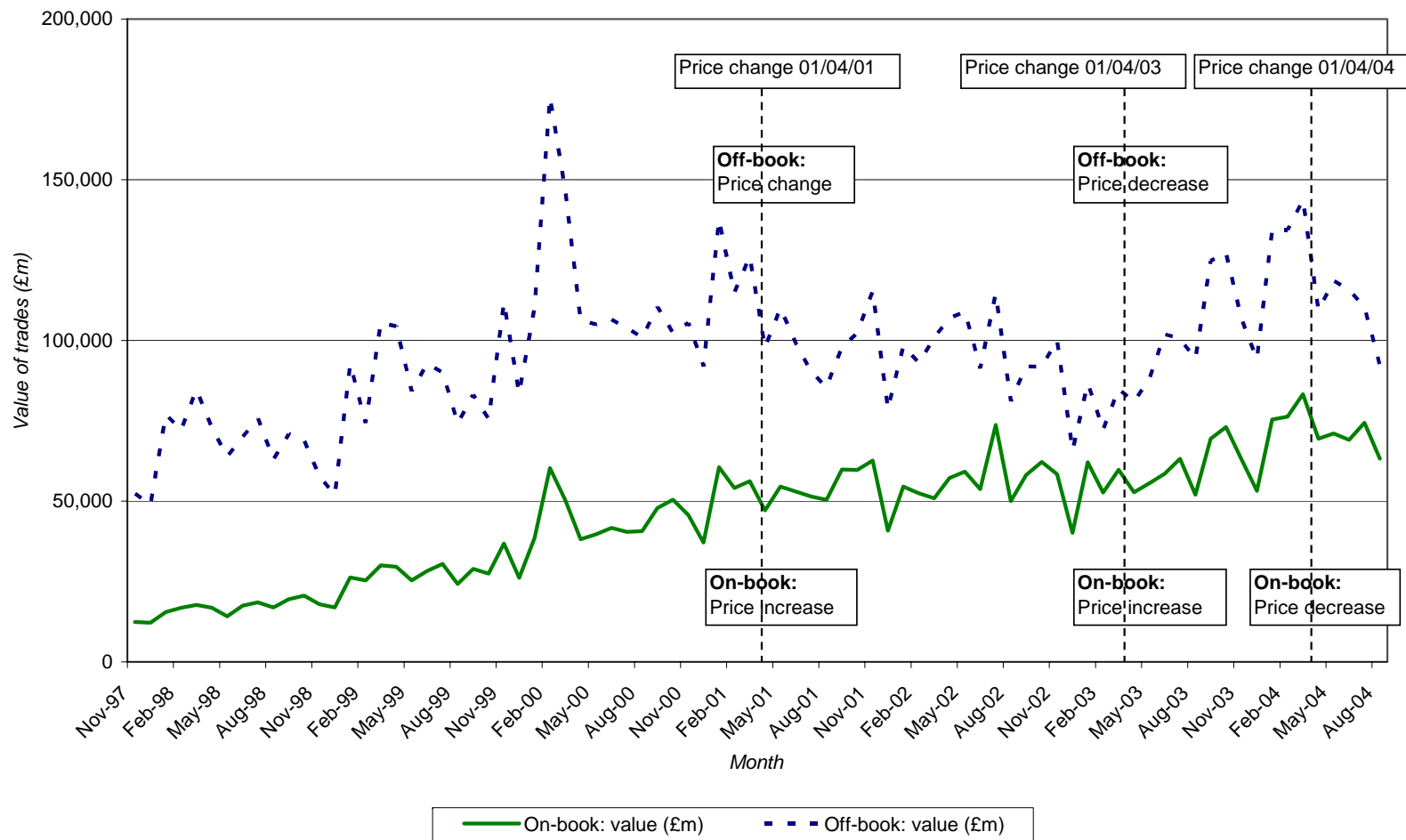
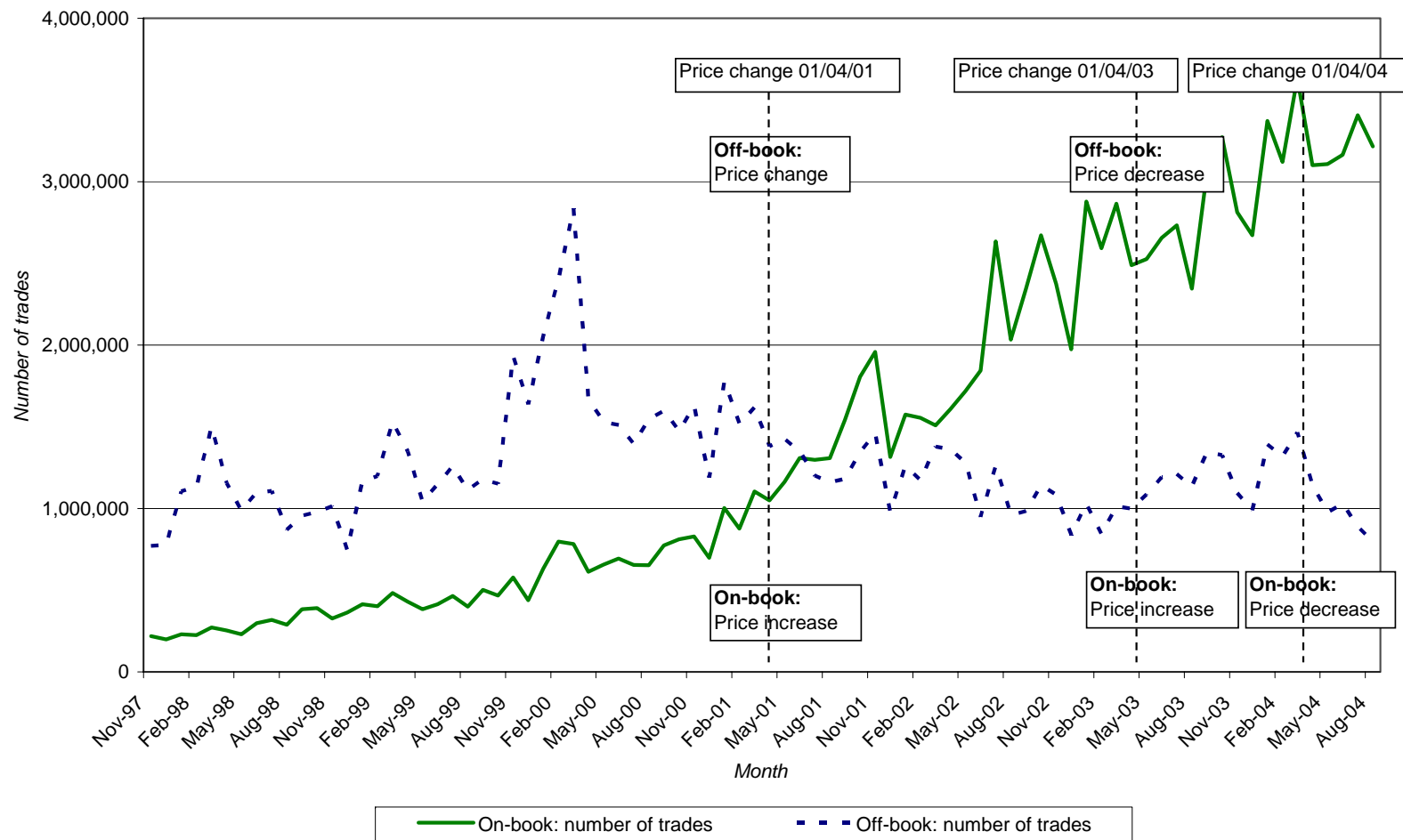


FIGURE 2

On- and off-book number of trades



8. We also considered the fee changes implemented by LSE from 2000 until the present time. These are summarized in Table 1.

TABLE 1 LSE fees, 2000 to 2005

	<i>Dates at which fee changes were implemented</i>						
	<i>1 Apr 2000</i>	<i>1 Apr 2001</i>	<i>1 Apr 2003</i>	<i>1 Apr 2004</i>	<i>1 Aug 2004</i>	<i>1 Jan 2005</i>	<i>1 Apr 2005</i>
<i>On-book (Aggressor pays)</i>			Removal of multifill*	All fees are in £			
				Discount scheme introduced†			
Minimum fee	0	0.25	0.25	0.25	0.25	0.25	0.25
Ad valorem per £1,000	0.06	0.08	0.08	0.08	0.08	0.08	0.08
Maximum fee	10	12.5	12.5	12.5	12.5	12.5	12.5
<i>Auctions (Both parties pay)</i>							
Minimum fee	0	0.25	0.25	0.25	0.25	0.25	0.25
Ad valorem per £1,000	0.03	0.08	0.08	0.08	0.08	0.08	0.08
Maximum fee	5	12.5	12.5	12.5	12.5	12.5	12.5
Transaction fee	0.05	0.05	0.075	0.075	0.075	0.075	0.075
<i>Order fee</i>							
Entered	0	0.01	0.01	0.01	0.01	0.01	0.01
Deleted	0	0.01	0.01	0.01	0.01	0.01	0.01
Modified	N/A‡	N/A‡	0.02	0.02	0.02	0.02	0.02
Icebergs	N/A‡	N/A‡	0.1	0.1	0.1	0.1	0.1
<i>Off-book</i>					Discount scheme introduced †		
<i>Agent</i>							
Minimum fee	0.25	0.25	0.25	0.25	0.1	0.08	0.08
Ad valorem per £1,000	0.15	0.1	0.1	0.1	0.085	0.065	0.065
Maximum fee	2.35	3	2.85	2.85	2.85	2.85	2.85
Transaction fee	0.05	0	0	0	0	0	0

Source: LSE.

\*Amounts to a fee increase (at least for some trading firms) as more transactions would be charged.

†Amounts to a fee decrease.

‡Not applicable.

9. LSE sets the trading fees that are paid for trading on-book and it also sets 'trade reporting' fees that are charged for off-book trading that is reported to LSE (see Appendix G for more details on the structure of trading fees). We note that given the complexity of such fee structures (see also Appendix G) and the differences in trading patterns of different customers, it is difficult to infer the impact on the average cost of a trade from the nominal changes. Table 1 shows that the fee changes that took place for on- and off-book trading since 2000 were implemented by LSE at

different times or in different directions. For example, in April 2003 LSE increased its transaction fee by 50 per cent (2.5p in absolute terms) and removed Multifill (thereby increasing the charge on some orders) whilst it reduced the maximum fee for off-book trades. The following year, a discount scheme was introduced for on-book trading, while no change was made to off-book fees. Finally fee reductions were introduced in August 2004 and January 2005 for off-book trading, while no change was introduced to on-book trading fees. These suggest little relationship between the fee changes on- and off-book.

### **Trading questionnaire responses and follow up calls**

10. We sent questionnaires to 42 trading firms that used LSE. These were chosen to cover a large proportion of LSE's revenue from trading fees (they accounted for around 80 per cent (by value and number) of trades on LSE in 2004/05) and to cover all the customer categories identified by LSE.
11. We received 8 responses from trading firms who accounted for almost half (by value and number) of trades on LSE in 2004/05 and represented various customer categories. We followed up the replies of six of the top 15 trading firms (by trading fees paid to LSE), with phone calls to clarify some of their replies, particularly in relation to substitutability between on and off-book trading.
12. Given the firms' different trading patterns, any change in fees or fee structures affects different firms in different ways. When considering a 5 per cent hypothetical fee increase for on-book trading, or considering more generally their ability to switch from on- to off-book, all trading firms found it difficult to give clear indications of their likely behaviour. However, a larger number provided statements to the effect that they could not vary the amount of trading they conduct on LSE's order book to any meaningful degree. A smaller number said they could to some extent, or would have

an incentive to do so, but were unable to quantify these likely changes in a way that could be used to estimate the overall demand response. A summary of responses to the trading questionnaire is published on the CC website. In that summary, we have aggregated and summarized the replies to each individual question to prevent the disclosure of commercially sensitive information. The summary does not therefore allow the response of each respondent to each question to be analysed in conjunction with its responses to other questions. However, in our analysis of the responses to the trading questionnaire we have done so and considered the consistency of the replies of each respondent overall so as to interpret them more accurately and quantify the statements concerning the ability to switch volumes.

13. This difficulty in gathering clear information on demand responses is consistent with similar difficulties faced by LSE itself, as stated in the next section.

#### **LSE's strategic fee review papers**

14. LSE provided us with documents from the strategic fee review group as evidence that could inform our assessment of market definition. These documents included the records of the following meetings between LSE and the major users:

(a) [redacted];

(b) [redacted];

(c) [redacted];

(d) [redacted];

(e) [redacted]; and

(f) [redacted].

15. These documents provide some background to LSE's price setting and its relationships with users. From an analysis of these documents, we could identify the following main points:

- The majority of the market participants consulted indicated that internalization will continue to grow, but also indicated that exchange pricing is not a key driver/barrier to this activity; this latter point is also noted by the LSE in the document, listed in paragraph 14(a);
- LSE noted that there is increasing sensitivity to costs as automated trading increases and that technical/black box trading appears highly elastic;
- LSE reported that on-book volume discounts appeared to have increased the flow of trades to the exchange and that clients believed that 'the current order book discount scheme [...] has been very successful in providing incentives to increase trading on the order book, and as volumes increase, the discount scheme will deliver further incentives to them'. LSE also noted that 'on investigation there was very little evidence to suggest a different discount structure or deeper discounts would deliver better incentives or deliver more trading onto the order book';
- LSE found it impossible to get a 'deep understanding' of price elasticity; and
- One customer (amongst nine consulted by LSE on a variety of issues, including support for DTS) strongly believed that it would see bigger price changes from competition (eg DTS, and would like LSE to start trading German equities) than from fee reviews. Of the nine customers consulted seven supported DTS, one did not and one was neutral.